President’s Message

It gives me great pleasure to note that the Center for Advanced Biomedical Research and Innovation (CABRI), Gulf Medical University is organizing the 7th Annual Scientific Meeting on the 04th & 05th of November, 2015 under the theme “Enhancing health care delivery-Optimizing the last mile”.

The vision of the Gulf Medical University is to become a Research Based University and the Annual Scientific meetings are instrumental to expand our academic as well as research environment. Gulf Medical University provides sufficient opportunities to the faculty and students to improve their skills through CME’s, Workshops, Journal club and scientific meetings.

As part of our strategic plans to improve the research environment, GMU has expanded the existing Research Division to CABRI with the state-of-the-art equipment. The Center aims at enhancing peer reviewed publications and IPR generation which will ensure GMU’s transition to a research based university.

To enhance research GMU has been encouraging academia - Industry collaboration to compete and win Industry sponsored research in the areas of mutual interest. External funded research studies have been initiated in last one year where the THUMBAY Network of teaching hospitals acts as active sites for data collection.

GMU has also expanded its research portfolio, by introducing competitive research grants in combination with the industry, and thus enabling more students and faculty from the fields of medicine, dentistry, pharmacy and allied health sciences to compete for, win and conduct industry sponsored research in areas of interest for the industry.

All of these offerings at Gulf Medical University propel our students’ educational experiences. They provide faculty with a world of opportunity and advance our understanding of the world we live in, set the groundwork for new technologies and contribute to the economic vitality of our region.

I appreciate and congratulate each and every faculty for their active participation and contribution to this event. I personally appreciate the academic achievements and research activities of all faculty, doctors and students of Gulf Medical University who have supported the GMU and THUMBAY Network of Teaching Hospitals till date.

My heartfelt congratulations to CABRI and the Scientific Program Committee of GMU for organizing this important event.

Thumbay Moideen
Founder President - GMU Board of Governors
Message from the Provost

The 7th GMU Annual Scientific Meeting marks the founding of this institution 17 years ago on 5 November 1998. The theme “Enhancing Healthcare Delivery – Optimizing the Last Mile” has set the trend for the presentations this year.

The Scientific Committee received 54 abstracts and 44 full papers. A total of 37 papers will be presented as 16 posters and 21 oral presentations. The papers are a mixture of observational and experimental studies conducted in multiple settings, the hospital, community and the laboratory.

Biomedical Sciences and Clinical Practice forms the largest chunk with 20 papers followed by 11 students’ presentation, 3 in Dental Sciences and Practice, 3 in Pharmaceutical Sciences and Clinical Pharmacy.

Each academic year two full days are dedicated to present the research studies and provide the university community an opportunity to attend the presentations in large numbers, hear the discussions and benefit from the new knowledge that has been generated. These scientific gatherings also serve as a time for fostering greater collaboration between the different medical and health sciences faculties to plant the seeds for future research.

The presentations are being published as full papers in the Proceedings for your reference and record. I take this occasion once again to commend the efforts of the Organizing and Scientific Committees in putting up the show! My congratulations to the investigators, students and faculty alike, for their efforts and the delegates for their encouraging participation, in advance!!

Prof. Gita Ashok Raj MBBS, MD, MNAMS
Provost, Gulf Medical University
Preface

Dear Readers,
On behalf of the 7th Annual Scientific Committee, it is our great pleasure to warmly welcome you all on 4th & 5th at GMU, Ajman for the 7th Annual Scientific meeting. This meeting is organized by The Center for Advanced Biomedical Research and Innovation (CABRI) with the aim of disseminating knowledge among researchers, academicians and students. Center for Advanced Biomedical Research and Innovation (CABRI) was inaugurated on 13th January 2014 by His Highness Sheikh Humaid Bin Rashid Al Nuaimi, Member of the Supreme Council UAE & Ruler of Ajman.

In 2014-15, many new super specialty tests have been launched by CABRI. They include Neo-natal Screening of infants for various inborn errors of metabolism, HLA B Allele Specific Sequencing, Beta Thalassemia Mutation Detection by PCR, Chromosomal Analysis, Microarray based genetic testing and Immunohistochemical assays for cancer screening. The clinical research facility coordinates collaboration with industry for sponsored research, enhances faculty-initiated research and supports student research. CABRI availed a major research grant from Al Jalila foundation funding for the second time. CABRI also trains GMU students as part time research assistants to enhance their skills and experience. CABRI has been accredited by the College of American Pathologists (CAP) which positions CABRI as the first CAP accredited high quality specialty laboratory in the Northern Emirates.

The theme of this year scientific meeting is "Enhancing health care delivery Optimizing the last mile". The objective of this meeting is to provide a highly interactive platform so as to bring together researchers of different disciplines from academic and research fields with the aim of collecting, exchanging and promoting the knowledge and new advances in health care. This event offers oral and poster presentations from various disciplines like Clinical Medicine, Pharmaceutical sciences, Dental disciplines, Health Profession education & Physical therapy. The meeting offers five oral and four poster sessions with 21 oral and 16 poster presentations by researchers. The presentations done in the meeting will inspire future studies and advancement in medical & health care disciplines. We expect that this program will be beneficial to everyone in a big way.

We take this opportunity to express our sincere thanks to the Founder President Mr. Thumbay Moideen for his continued support & encouragement. We thank the Provost, Prof.Gita Ashok Raj for her guidance and attention to make this meeting a success. Our special thanks to Scientific Committee members, the Reviewers, the Presenters and the volunteers for their generous contributions to this meeting.

Dr. P. K. Menon, MD, PhD, MBA, CPHQ
Chairperson, Scientific Committee
7th Annual Scientific Meeting
Gulf Medical University, Ajman
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Pilot Study on Microbial Flora of Water Contained in Shisha Water Pipes and their Identification by MALDI-TOF MS</td>
<td>12</td>
</tr>
<tr>
<td>Immunological effects of BCG vaccine on adults asthmatic patients</td>
<td>17</td>
</tr>
<tr>
<td>Residual Intradural Oil-based Contrast Agent: A Case Report</td>
<td>28</td>
</tr>
<tr>
<td>Assessment of the Utilization Pattern and Related Knowledge of Nasal Decongestants among University Students in Ajman, UAE</td>
<td>35</td>
</tr>
<tr>
<td>Prevalence and Factors Affecting Nasobronchial Allergy Among University Students in Ajman, UAE</td>
<td>44</td>
</tr>
<tr>
<td>The knowledge, attitude and behavioral-intent regarding cervical cancer and the human papillomavirus (HPV) vaccine: A cross-sectional study among female university students in Ajman, UAE</td>
<td>52</td>
</tr>
<tr>
<td>Presence of Test Anxiety and Association with Forms of Assessment among Health Sciences students in Ajman, UAE</td>
<td>66</td>
</tr>
<tr>
<td>The Effect of Anemia on Pregnancy and Fetal Outcome: GMC Hospital, Ajman, UAE</td>
<td>75</td>
</tr>
<tr>
<td>Unrecognized dyslipidemia among patients presented with first attack of acute coronary syndrome (ACS) in a multi-ethnic population in GMC hospital, Ajman, UAE (Dyslipidemia-ACS UAE Study)</td>
<td>82</td>
</tr>
<tr>
<td>A Unique Case Of Upper And Lower Gi Bleeding In A Cirrhotic Patient</td>
<td>92</td>
</tr>
<tr>
<td>Spontaneous Intracranial Hypotension: An Interesting Cause of Intractable Headache</td>
<td>99</td>
</tr>
<tr>
<td>Recurrent Venous Thrombo-Embolism in a Young Adult Female: Case Report with Review of Literature</td>
<td>104</td>
</tr>
<tr>
<td>Accessory Pancreatic Lobe With Gastric Duplication Cyst- A Rare Case Of Recurrent Acute Pancreatitis</td>
<td>111</td>
</tr>
<tr>
<td>The Relationship between Oral Self-care and Oral Hygiene among Diabetic Patients in Ajman, United Arab Emirates</td>
<td>117</td>
</tr>
<tr>
<td>A Case Report: Management of Drug Induced Gingival Enlargement in a Kidney Transplant Patient</td>
<td>123</td>
</tr>
<tr>
<td>How Accurate can Electrocardiogram Predict Left Ventricular Diastolic Dysfunction?</td>
<td>130</td>
</tr>
<tr>
<td>Application of a Rapid Assay to Detect Targeted Numerical and Structural Anomalies in Patient with Congenital Malformations</td>
<td>139</td>
</tr>
<tr>
<td>Atypical Mycobacterial Infection: A Case Report</td>
<td>147</td>
</tr>
</tbody>
</table>
7th Annual Scientific Committee Members

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prof. P. K. Menon</td>
<td>Chairperson</td>
</tr>
<tr>
<td>Prof. Manda Venkatramana</td>
<td>Member</td>
</tr>
<tr>
<td>Prof. Shatha Al Sharbatti</td>
<td>Member</td>
</tr>
<tr>
<td>Prof. Mohammed Said Hamed</td>
<td>Member</td>
</tr>
<tr>
<td>Prof. Arun Shirwaikar</td>
<td>Member</td>
</tr>
<tr>
<td>Dr. Praveen Kumar</td>
<td>Member</td>
</tr>
<tr>
<td>Dr. Ramesh Ranganathan</td>
<td>Member</td>
</tr>
<tr>
<td>Dr. Ihsan Ullah Khan</td>
<td>Member</td>
</tr>
<tr>
<td>Prof. Mohamed Arifulla</td>
<td>Member</td>
</tr>
</tbody>
</table>

Review Committee Members

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prof. Jayadevan Sreedharan</td>
<td>Member</td>
</tr>
<tr>
<td>Dr. Nisha Shantakumari</td>
<td>Member</td>
</tr>
<tr>
<td>Prof. Edwin D'Souza</td>
<td>Member</td>
</tr>
<tr>
<td>Dr. Sura Ali</td>
<td>Member</td>
</tr>
<tr>
<td>Prof. Annie Shirwaikar</td>
<td>Member</td>
</tr>
<tr>
<td>Dr. Kumaraguruparan Gopal</td>
<td>Member</td>
</tr>
<tr>
<td>Dr. Victor Raj Mohan Chandrasekaran</td>
<td>Member</td>
</tr>
<tr>
<td>Prof. Susirith. Mendis</td>
<td>Member</td>
</tr>
<tr>
<td>Dr. Biswadip Hazarika</td>
<td>Member</td>
</tr>
<tr>
<td>Dr. Pankaj Lamba</td>
<td>Member</td>
</tr>
<tr>
<td>Prof. Ishtiyaq Ahmed Shaafie</td>
<td>Member</td>
</tr>
<tr>
<td>Prof. Anoop Agarwal</td>
<td>Member</td>
</tr>
<tr>
<td>Dr. Rizwana B Shaikh</td>
<td>Member</td>
</tr>
<tr>
<td>Prof. Meenu Cherian</td>
<td>Member</td>
</tr>
<tr>
<td>Dr. Mohammed Khalid</td>
<td>Member</td>
</tr>
</tbody>
</table>

Publicity and Logistics

Mr. Ravi Tipparaaju, Asst. Director, Health Communication Division
Mr. Vignesh S Undkat, Director, IT & Promotions
Mr. Subeesh Pothinchery, Manager, General Services
Mr. Asher Jahangir, Manager, Physical Facilities

Technical Editing

Prof. Dr Tatiana Ille • Dr. Amira Ibrahim Hassan Awad Gaber

Programme Coordinators

Mr. Mohammed Thanzeel • Ms. Nidhi Sharma • Mr. Rahul Sharma • Mr. Mudrikat Ameemar • Ms. Beula Rachel Cherian • Ms. Niral Vaghasia • Mr Sujaikath • Ms. Bharthi Sivakumar

Mawahib Abd Salman Albiate1*, May Khalil Ismail2

1Department of Obstetrics and Gynecology, Gulf Medical College Hospital and Research Centre, Ajman, UAE
2Department of Biochemistry, Gulf Medical University, Ajman, UAE
*Presenting Author

ABSTRACT

Background: Cornual ectopic or interstitial pregnancy refers to pregnancy implantation in the intrauterine portion of fallopian tube. Although it is an unusual type of ectopic pregnancy with an estimated rate of 2-4% of other types of ectopic gestation it carries a major risk of maternal morbidity and mortality rate of 2-5% which is the highest rate compared to other types of ectopic pregnancy. Due to its abnormal location there is an inherent difficulty and delay in the diagnosis and treatment. Majority of cases present as acute emergency with life threatening situations. Previously the traditional treatment of cornual pregnancy has been immediate surgical intervention in the form of hysterectomy or cornual resection at laparotomy or laparoscopy. Recently the current trend of treatment has been shifted to conservative medical treatment to minimize the unfavorable effect of surgery on maternal morbidity and future fertility. There are various reports of satisfactory results of conservative medical treatment for cornual pregnancy, but it is still controversial if it is the safest treatment option for the problem.

Materials & methods: This is a case report of a patient who has been diagnosed in Gulf medical hospital Ajman, UAE as a cornual ectopic pregnancy. She was managed conservatively with successful results. A single dose of methotrexate injection of 50 mg /m² was administrated. Patient follows up showminimal side effects.

Results & conclusion: Cornual pregnancy can be treated successfully with methotrexate injection with minimal side effects. This indicates that methotrexate can be used as an alternative treatment to surgical management to prevent possible risk of surgical intervention.

Keywords: Cornual ectopic, pregnancy, methotrexate
INTRODUCTION

Cornual or interstitial pregnancy refers to a pregnancy that implants in the proximal tubal segment than lies within the muscular uterine wall. Although it is an unusual problem with an estimated rate of 2-4% of all ectopic pregnancies, it carries the major risk of maternal morbidity and mortality rate of 2-2.5% which is the highest compared to other types of ectopic pregnancies. This abnormal location of pregnancy usually occurs following the same risk factors of other types of ectopic gestation specifically in vitro fertilization (IVF) or previous salpingectomy. In the majority of cases, there are no specific risk factors.

According to the report of Confidential Enquiry into Maternal and Child Heath report for 2000-2002, it was concluded that cornual pregnancy is the most dangerous type of ectopic pregnancy. Four out of 11 deaths from ruptured ectopic pregnancy were due to ruptured cornual pregnancy. The diagnosis was late and made only after rupture in all cases.

There is a challenge in the diagnosis and treatment of the problem of cornual ectopic pregnancy. The majority of cases present as acute emergencies with a life threatening situation. The abnormal location which can be misinterpreted with intrauterine pregnancy leads to delay and difficulty in the diagnosis. Therefore, it is associated with high morbidity and mortality rate. The other hazard of the problem is the risk of uterine rupture due to weakened myometrium wall. And because of the abundant blood supply in cornual area from uterine and ovarian vessels, uterine rupture may lead to massive hemorrhage and even death despite great development in the diagnostic procedures and treatment modalities.

The basic diagnosis in this condition depends on serial quantitative assessment of serum Beta-Humanchorionic gonadotrophin (Beta-HCG) and Transvaginal ultrasonography (TVS). The routine use of ultrasound is imperative for rapid and accurate diagnosis to prevent serious complications or death and to enhance the use of more conservative medical management. Direct visualization by Transvaginal ultrasound scan is the mainstay for rapid diagnosis using the following three criteria.

1. An empty uterus
2. A gestational sac seen separately and <1 cm from the most lateral edge of the uterine cavity
3. A thin myometrium layer surrounding the sac <5 mm.

Treatment

Previously in the traditional treatment of cornual pregnancy, surgery has been the main option due to avoid uterine rupture and massive bleeding. The main surgical procedures include hysterectomy or cornual resection at laparotomy, laparoscopy or the use of hysteroscopy. Radical surgery was used as a life saving measures in cases of massive bleeding or rupture uterus. Laparoscopic procedure is considered before laparotomy in unruptured cases with the availability of skilled surgeon. Recently there is a change in the clinical practice of management toward the higher use of conservative treatment due to the immediate detrimental effect of surgical intervention with anesthesia in addition to the future effects on fertility.

Medical treatment

A recent development in the management of ectopic pregnancy has been the introduction of medical management which was started on mid 80-ties. The medical methods have focused on the use of methotrexate. The earlier protocol for medical treatment was based on multiple dose regimens of methotrexate and prolonged hospitalization which were associated with significant side effects. Currently these protocols have been modified to the use of a single –dose regimen with outpatient management.
**Systemic methotrexate**

Methotrexate, a folic acid antagonist, inhibits DNA synthesis in actively dividing cells including trophoblast. It has a success rate up to 95% if it is used in appropriately selected cases. The criteria to recommend for methotrexate treatment of ectopic pregnancy are as follows:

- Hemodynamic stability
- Ability and willingness of the patient to comply with post treatment follow up:
  - Initial serum Beta- HCG concentration less than 5000IU/L
  - Absence of fetal cardiac activity by ultrasound scanning.

There is evidence for the increased use of methotrexate in the treatment of cornual ectopic pregnancy. This may be due to the early assessment and accuracy in the diagnosis with the development and availability of high resolution ultrasound and serum B-HCG measurement. In addition to that, there is an extensive increase in the experience of the use of methotrexate in the management of ectopic pregnancy.

Regarding the route of administration of methotrexate, the systemic route of administration was reported to be preferable over the local injection of ectopic gestational sac as it is less invasive and not operator dependent.

**Methotrexate versus surgical therapy**

Previously the management of ectopic pregnancy was limited to surgery. With growing experience with methotrexate the treatment of selected cases of ectopic pregnancies has been revolutionized. Medical treatment of ectopic pregnancy in selected cases may be considered as the first line therapy over surgical treatment for many reasons mainly related to the prevention of surgical and anesthetic implications with less damage to the tubes and a better chance of preserving fertility after treatment in addition to less cost and hospitalization.

This presentation is a case report of Cornual ectopic pregnancy with a serum Beta-HCG titer of 8318.5IU/mL which was successfully treated with a single dose of intramuscular injection of methotrexate injection (50 mg/m²).

**CASE REPORT**

A 37 year – old Jordanian lady, para 3 presented to the outpatient department of Gulf medical Hospital Ajman on 23rd December 2014. She attended because of vaginal spotting for the last month. She was on natural contraception and denied a history of missed period. Serum B-HCG level was 8318.5IU/m. Transvaginal ultrasound showed an empty uterine cavity, polycystic ovaries, and anterior uterine fibroid with cystic lesion in the cornua of a size of 3.5cm (figure 1&2). There was no free fluid in the pelvic cavity. Full blood count showed hemoglobin level of 12.4 and Hematocrit of 35.60%. The clinical examination showed normal vital signs. Abdomino-pelvic examination showed normal size uterus with no palpable adnexal mass or tenderness. There was no guarding or tenderness. The patient was diagnosed as case of cornual ectopic pregnancy. After counseling about the method of treatment the patient was willing for methotrexate injection and refused any surgical intervention. The patient was admitted to the gynecological ward for full monitoring. Full blood count with liver and renal function test were normal. A verbal and written consent were obtained from the patient for methotrexate injection with continuous follow up and surgical intervention if required after that. As there was no contraindication to methotrexate injection a single injection with dose of (50mg/m²) was administered intramuscularly after complete evaluation. She was advised not to take folic acid until complete resolution of the ectopic pregnancy with avoidance of sexual activities. On the fourth day after methotrexate therapy the patient returned with mild abdominal pain with increasing level of serum Beta-HCG titer to 12320 IU/ml. Clinical examination revealed a stable...
condition. Repeated transvaginal sonogram did not show free fluid in the pelvic cavity with no change in the size of the ectopic gestational sac. Full blood count showed normal hematological findings. On the seventh day of methotrexate administration serum Beta-HCG titer was dropped to 7000IU/ml. Continuous follow up was done with weekly measurement of the concentration of serum Beta-HCG and transvaginal ultrasound scanning. The level of Beta-HCG titer was decreasing gradually and continuously in each week to be 250IU/ml on 17th February 2015. The patient did not attend for follow up until the last visit on 26th April 2015. She had no complaint with a stable condition and serum concentration of BetaHCG titer was< 5.00IU/ml. The findings of transvaginal ultrasound revealed degenerated and reduced diameter of the mass to 0.7cm on the left cornua.

(Figure 1) (Figure 2)

DISCUSSION
While all ectopic pregnancies are associated with a risk of hemorrhage, interstitial pregnancies are associated with highest risk of massive uncontrollable bleeding with a mortality rate of 2%15. This high mortality rate is partially due to the difficulty and delay in the diagnosis as well as the speed of hemorrhage. The condition may be misinterpreted with normal intrauterine pregnancy and associated with delay in diagnosis. Previously most cases were diagnosed at the time of laparotomy with rupture. Because of the late diagnosis surgery was the most common management option. In spite of the higher rate of maternal morbidity and future implications on fertility there was no role for expectant management due to the high risk of rupture and massive hemorrhage16.

In the present case, there were no specific symptoms apart from minimal vaginal bleeding. This may be usual in early cases of ectopic pregnancy. There is an increasing evidence of asymptomatic cases with ectopic pregnancies without the usual presentation of lower abdominal pain and vaginal bleeding16.

For our patient, the diagnosis was mainly based on the results of transvaginal ultrasound scanning and serial quantitative assessment of serum Beta-HCG concentration. Transvaginal ultrasound scanning is considered as basic diagnostic facility to the early diagnosis of cornual pregnancy. The ultrasonography diagnosis is challenging and needs expert hands. The diagnosis may be helped by the eccentric position of the gestational sac with an empty uterine cavity and the presence of a thin (less than 5mm) or even absent myometrium surrounding the sac are highly suggestive of cornual ectopic pregnancy6,17. The accuracy of diagnosis may be improved with the use of Doppler studies showing increase vasculature around the gestational sac18. The gestational sac is usually visualized away from the thickened endometrium of pregnancy. In experienced hands, the diagnosis of cornual pregnancy can be established in 71% of the cases with use of tranvaginal ultrasound4. The sensitivity of
the diagnosis has been improved with the use of 3-D and 4–D ultrasound scanning\textsuperscript{19,20}.

In addition to sonographic assessment serial serum monitoring was useful in establishing the diagnosis and monitoring in this patient although there are reports of doubling serum Beta- HCG in cornual ectopic pregnancy\textsuperscript{18}. It is contrary to the other types of ectopic pregnancies which is known to be associated with inconsistent and suboptimal increase or plateau of serum Beta-HCG \textsuperscript{21}. Therefore, caution is highly recommended with interpretation of the results in addition to the extended and prolonged follow up as the hormone concentration will take a longer time to return to the normal level with cornual pregnancy.

In the management of this patient the medical management was considered as the option of choice as the criteria were suitable to select this method in addition to the strong patient refusal for surgical management. The only controversy in the selection of the patient may be related to the high level of serum Beta HCG titer (8318.5IU/ml) at the time of presentation. The Royal college guideline has recommended that patient is suitable for medical treatment. If the serum Beta-HCG titer is $< 3000$ IU \textsuperscript{22}. However, there are previous reports of cases being treated successfully with methotrexate in spite of the higher level of serum B-HCG\textsuperscript{5,23}. Jermy K et al suggested that when the initial serum Beta HCG is greater than 5000 IU second systemic dose of methotrexate is more likely to be required for a successful outcome\textsuperscript{23} conversely the initial serum Beta HCG titer in our patient was higher and treated with single injection without the need for surgical intervention or repeated doses. In our case the level of serum BHCG concentration was near to the level of (8096IU/ml) reported by Goruk et al on 2012 for a patient who was also treated successfully with a single dose of methotrexate\textsuperscript{5}. However, there are previous reports stating that the best predicton of success of medical therapy is the initial Beta-HCG level. Based on Lipscomb et al efficacy studies it was reported that the success rate was 94% for a single injection of methotrexate when the initial level of serum B-HG level is less than 10,000 mIU/ml, and 93% when the level is less than 15000 mIU/ml. There is no clear data regarding the effects of ectopic size, but the larger the ectopic it is more likely that the treatment fails\textsuperscript{24}.

In spite of the reported increase in the percentage of patients treated with single dose of methotrexate, failure rate is high and has been reported in 15% of cases who required additional doses or surgical therapy\textsuperscript{25}. So careful counseling of the patient is required with close monitoring as rupture is possible even after the treatment. The patient should be informed for strict and extended follow up.

With regard to the future fertility, the patient with cornual pregnancy should be informed that likelihood of recurrence in subsequent pregnancies is higher compared with other types of ectopic pregnancy. If the uterus is conserved, there is an increasing incidence of uterine rupture in future pregnancies\textsuperscript{26}. However, the data about the absolute increase in such risks is still conflicting.

In consideration to the optimum mode of delivery in subsequent pregnancy, cesarean section is advised by many clinicians. However it is still controversial about the safety of cesarean section versus vaginal delivery after cornual ectopic treatment \textsuperscript{27}.

In conclusion cornual pregnancy is associated with significant diagnostic challenge and carries a higher rate of maternal morbidity and mortality than tubal pregnancy. With the availability of high resolution ultrasound with rapid accurate estimation of serum BHCG early diagnosis can be established. Strict follow up of the specific diagnostic criteria of transvaginal ultrasound can improve the accuracy of diagnosis. With early diagnosis, for properly selected patients conservative management should be considered as an initial treatment. Single dose of methotrexate with close monitoring and follow up is effective and safe option. It can be utilized as an alternative to surgical intervention with its associated complications.
REFERENCES

A Pilot Study on Microbial Flora of Water Contained in Shisha Water Pipes and their Identification by MALDI-TOF MS

Menon PK*, Sajit AK, Rehman O, Tamali S, John S
CABRI, Gulf Medical University, Ajman, UAE
*Presenting Author

ABSTRACT

Objective: The water containing jar of the shisha water pipe is constantly moist and is a potential site for bacterial growth and biofilm formation. This study aims to examine the microbial flora and bacterial load of the water in the shisha water jar so as to determine possible risks to users.

Material and Methods: Three shisha cafes participated voluntarily in the study. Seventeen de-identified water samples were collected from Shisha pipes being used by various customers at the participating Shisha Cafes. Samples were collected using sterile precautions. Ten μL from the water samples were inoculated on a blood agar plate and incubated at 37°C for 24 hours. The bacterial CFUs/mL were counted manually and organisms isolated were identified by Proteomic fingerprinting of ribosomal proteins using a Bruker Biotyper™ working on the principle of Matrix Assisted Laser Desorption Ionization-Time of Flight Mass Spectrometry, (MALDI-TOF MS).

Results: Seventeen samples were collected. Eleven samples showed microbial growth of 100 to 3000 CFUs/ml with a median value of 400 CFUs/ml. Six samples were sterile. Of the eleven samples, six samples had one organism each, two samples had two organisms each, one sample had three organisms and the last sample had five organisms. The 18 organisms isolated were distributed among nine species: Acidovorax temperans (3 isolates), Burkholderia vietnamiensis (3 isolates), Candida pelliculosa (1 isolate), Delftia acidovorans (1 isolate), Enterobacter cloacae (3 isolates), Escherichia hermannii (1 isolate), Klebsiella pneumonia (2 isolates), Pseudomonas aeruginosa (1 isolate), and Raoultella ornithinolytica (1 isolate). Two isolates could not be identified.

Conclusions: The organisms isolated have been referenced in literature as pathogens or emerging pathogens capable of causing infections. Presence of significant amounts of pathogens in Shisha water suggests the strong possibility of inhalation of aerosols containing microbes by shisha smokers. The poly microbial nature of the isolates especially suggests the formation of bacterial biofilms. Interestingly almost all the isolates were gram negative bacteria, which contain lipopolysaccharide (LPS) in their cell walls. LPS is a microbial protein that stimulates innate immunity. LPS has been shown to be an etiological agent of acute and chronic airway obstruction and disease. Thus LPS from bacterial aerosols can contribute to the causation of COPD in chronic users, simultaneously exposing them to the risk of infection by newer emerging pathogens.

Keywords: Microbial flora, shisha, MALDI-TOF MS
INTRODUCTION

A Shisha or hookah is a water pipe for smoking flavoured tobacco called shisha in which the smoke from the burning tobacco is passed through water\(^1\). The water pipe originates from Iran around the 7th Century AD. It travelled East to India and became the Hookah and travelled west towards Egypt. Smoking Shisha has gained popularity world over and more and more young people are taking to it. Shisha is a sweet smelling tobacco is gaining in popularity rapidly amongst the youth. These pipes are considered harmless because tobacco smoke is “purified” as it passes through the water. Shisha tobacco and shisha cafes are not licenced. The tobacco burns in a small dish on top of the main body of the water-pipe. The tobacco is sweetened with glycerine, which can make it damp, so charcoal is added to keep the tobacco burning. The smoke inhaled derives from the tobacco (nicotine and other carcinogens) as well as the charcoal (toxic substances, CO, heavy metals and tar)\(^2\). It was observed that in shisha cafes, the Shisha water pipes stored had water in the water base. A casual observation of the water jar revealed that the inner surface was moist and slimy suggesting existence of a biofilm. Presence of a biofilm would predispose the user to inhale microbe containing aerosols generated by the bubbling of air through the water in the water jar. This study aimed to examine the microbial flora and bacterial load of the water contained in the shisha water jar so as to determine possible risks to users.

MATERIAL AND METHODS

Many Shisha bars were visited, the proposed methodology explained and requested to participate voluntarily in this pilot study. Samples were collected from the water bowls of Shisha water pipes which had been recently used. One mL of the water present in the Shisha bowl was collected into a sterile Eppendorf tube using a sterile disposable plastic dropper. This was immediately transported to the Microbiology lab at the Centre for Advanced Biomedical Research and Innovation and stored at 4°C for a maximum of 24 hours, prior to culture. 10µl of the sample was plated on a blood agar plate, and the plates incubated overnight at 37°C in the presence of 5% CO2. The plates were examined for growth of organisms the next day. A bacterial count was carried out to quantify the bacteria present. Pure growths were examined using Matrix Assisted Laser Desorption Ionization-Time of Flight Mass Spectrometry (MALDITOF-MS) using the Bruker MALDI Biotyper CA System™ to measure a unique molecular fingerprint of an organism\(^3\). The Matrix is α-Cyano-4-hydroxycinnamic acid (HCCA). The bacterial sample is uniformly mixed in a large quantity of matrix. When a laser is shone on the bacterium mixed in the matrix, a small part of the matrix heats rapidly and is vaporized, together with the sample. The matrix absorbs the ultraviolet light (nitrogen laser light, wavelength 337 nm) and converts it to heat energy. Charged ions of various sizes are generated. A potential difference between the sample slide and detector attracts the ions through space until they reach the detector. The time of ion flight differs according to the mass-to-charge ratio (m/z) value of the ion. This method of mass spectrometry is called Time of Flight Mass Spectrometry. The loaded target was taken up for MALDI-TOF-MS measurement to determine the unique molecular fingerprint of an organism. Spectra were recorded and analysed so as to accurately identify a particular microorganism by matching it against a FDA-cleared library\(^4\). Being a pilot study and not involving human subjects no ethical issues were envisaged to carry out the study.
RESULTS
Three anonymous shisha cafes participated voluntarily in the study. 17 de-identified water samples were collected from Shisha pipes using sterile precautions. Six samples did not show any growth. Eleven samples showed growth ranging 100 to 3000 CFU/ml, with a median value 400 CFU/ml, a mean value of 595 CFU/ml. Of the eleven samples, six samples had one organism each, two samples had two organisms each, one sample had three organisms and the last sample had five organisms. The 18 pure cultures of organisms were isolated, they were distributed among nine species: Acidovorax temperans (3 isolates), Burkholderia vietnamiensis (3 isolates), Candida pelliculosa (1 isolate), Delftia acidovorans (1 isolate), Enterobacter cloacae (3 isolates), Escherichia hermannii (1 isolate), Klebsiella pneumonia (2 isolates), Pseudomonas aeruginosa (1 isolate), and Raoultella ornithinolytica (1 isolate). Two isolates could not be identified. The results are also presented in Table 1 below.

Table 1: Organisms isolated from the Shisha water bowl

<table>
<thead>
<tr>
<th>Organisms Isolated</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acidovorax temperans</td>
<td>3 isolates</td>
</tr>
<tr>
<td>Burkholderia vietnamiensis</td>
<td>3 isolates</td>
</tr>
<tr>
<td>Candida pelliculosa</td>
<td>1 isolate</td>
</tr>
<tr>
<td>Delftia acidovorans</td>
<td>1 isolate</td>
</tr>
<tr>
<td>Enterobacter cloacae</td>
<td>3 isolates</td>
</tr>
<tr>
<td>Escherichia hermannii</td>
<td>1 isolate</td>
</tr>
<tr>
<td>Klebsiella pneumoniae</td>
<td>2 isolates</td>
</tr>
<tr>
<td>Pseudomonas aeruginosa</td>
<td>1 isolate</td>
</tr>
<tr>
<td>Raoultella ornithinolytica</td>
<td>1 isolate</td>
</tr>
<tr>
<td>Not Identified</td>
<td>2 isolates</td>
</tr>
<tr>
<td>Total</td>
<td>16 isolates</td>
</tr>
</tbody>
</table>

DISCUSSION
There have been very few studies on the microbes and microbial products associated with tobacco smoking. Markowicz et al\(^5\) analyzed water pipe smoke for presence of 3-hydroxy fatty acids of bacterial lipopolysaccharide (LPS) and ergosterol of fungal origin. Water pipe smoke was shown to contain an average of 1800 pmol LPS and 84.4 ng ergosterol per session, suggesting the formation of a bio aerosol. Safizadeh et al\(^6\) collected 285 swabs from different parts of the water pipe and found 82.8% positive for microbial contamination, Organisms isolated Coagulase-negative staphylococci, Streptococcus spp, Neisseria spp and Escherichia coli. Interestingly 96% of samples from bowl water were found to be contaminated.

In our pilot study eleven out of seventeen samples from the bowl water were found to be contaminated. A review of the organisms isolated showed them to be abundant producers of lipopoly saccharide and were capable of bio-film formation. The organisms identified are emerging pathogens capable of causing infections. Acidovorax temperans is an abundant member of activated sludge. It adheres readily to surfaces, where it forms biofilms\(^7\). Burkholderia vietnamiensis are opportunistic pathogens that can cause severe disease in cystic fibrosis (CF) patients and other immune compromised individuals and are typically multidrug resistant\(^8\). Candida pelliculosa is
a yeast frequently found in various fruits, tree exudates, soil, vegetables and other organic compounds. It has occasionally been reported as the causative agent of nosocomial fungemia in both immune competent and immune compromised paediatric patients\(^9\). Delfita Acidovarans has been reported to be associated with indwelling catheters, drain tubes and recurrent vascular catheter-related bacteraemia caused by Delfta acidovorans has been reported\(^10\). Enterobacter cloacae contaminate various medical, intravenous and other hospital devices. Nosocomial outbreaks have also been associated with colonization of surgical equipment and operative cleaning solutions\(^11\). Escherichia hermannii is considered to be non-pathogenic. The ability to produce mannose-rich exopolysaccharides and to form meshwork-like structures and form biofilms can contribute to its pathogenicity, most of the cases have been reported as a co-infection with other known human-pathogenic bacteria\(^12\). Klebsiella pneumonia has been a known cause of pneumonia and sepsis. It produces abundant polysaccharide to form mucoid colonies\(^13\). Pseudomonas aeruginosa is a common pathogen and has been associated with a variety of infections and also has a large polysaccharide capsule\(^14\). RaoulteItella ornithinolytica has been isolated from dentin of infected root canals and rare cases of bacteraemia\(^15\).

All the organisms identified produce exo-polysaccharides and are capable of producing biofilms. They have been associated in device related infections in the immune-compromised. All the organisms are known pathogens or emerging pathogens. Have been described to cause bacteraemia. Thus in the Shisha Biofilms that are formed can result in contaminated water. Aerosols with bacteria are generated as air bubbles through the contaminated water. Biofilms are formed when bacteria adhere to surfaces in a moist environment and excrete an extracellular matrix. Biofilms often have many species of bacteria, fungi etc., coexisting with each other. They are resistant to routine doses of microbicidal agents. The biofilm formation involves initiation, maturation, maintenance, and dissolution. A biofilm is a dense aggregate of surface-adherent microorganisms embedded in a polysaccharide matrix. The important factors influencing biofilm formation are moisture, temperature, surfaces and nutrients in water\(^16\).

LPS is ubiquitous and is a constituent of the outer membrane of Gram-negative bacterial cells. LPS is a microbial protein that stimulates innate immunity. Decreases in lung function have been demonstrated after acute inhalation of LPS\(^17\). Longitudinal studies have determined the risk for chronic respiratory disease and the corresponding decline in lung function have been found to be related to a high level of LPS exposure. LPS has been shown to be an etiological agent of acute and chronic airway obstruction and disease. Thus LPS from the bacterial aerosols arising from contaminated water in the Shisha water jars can contribute to the causation of COPD in chronic users, simultaneously exposing them to the risk of infection by newer emerging pathogens. The study is limited by the small number of samples examined as well as the few Shisha café’s which participated in the study.

**CONCLUSIONS**

Presence of significant amounts of microbes in Shisha water jars suggest the strong possibility of inhalation of aerosols containing microbes by shisha smokers. The poly microbial nature of the isolates especially suggests the formation of bacterial biofilms in the Shisha water jar. LPS from the cell walls may be an etiological agent of acute and chronic airway obstruction and disease seen in smokers. It is strongly recommended that a larger study be carried out to evaluate biofilm formation, bacterial load and species of organisms within the Shisha water bowl. This may help in
decreasing the incidence of chronic obstructive airway disease seen in chronic smokers.

REFERENCES

Immunological effects of BCG vaccine on adults asthmatic patients

Mabrouk S1,2, Okba A2, Refaat M2, El Shayp M2 and Makawy M3

1Internal Medicine Department, Thumbay Hospital, Dubai, UAE
2Internal Medicine Department, 3Clinical Pathology Department, Ain Shams University- Egypt

*Presenting Author

ABSTRACT

Introduction: The immunologic hallmark of atopic allergy e.g. asthma is an increased production of IgE and T helper(h) type 2 cell cytokines (interleukin (IL)-4, IL-5, IL-9 and IL-13 by Th cells reacting to environmental allergens. In contrast, inhalation of allergens by healthy non-atopics produce allergen- specific IgG1, IgG4 and the Th1 cytokine interferon-α, as well as IL-12 from macrophages. There is compelling evidence that allergen- specific Th2 cells accumulate in the target organ of atopic patients e.g. airways of asthmatics and play a crucial role in the pathogenesis of allergy. Thus, preventing or reversing the differentiation of Th cells into Th2 cells appears a logical therapeutic approach to atopic asthma.

Objective: The purpose of this study was to determine whether a Th1 immune response elicited by BCG immunization could suppress allergic inflammation in adult asthmatic.

Material and methods: Thirty four asthmatic patients, 16 extrinsic with positive allergy skin test (AST): group 1, 18 intrinsic with negative AST: group 2 and 21 healthy individuals: group 3 were subjected to this study. Tuberculin test was performed for all groups and subjects with positive results were excluded. BCG vaccine was given for all groups, with assessment of total IgE and Th2 (IL-4), Th1 (IL-2) cytokine response. Significant reduction of total IgE, IL-4 and elevation of IL-2 were seen in group 1 (atopic asthma) following BCG vaccine, while no significant change was observed in group 2 regarding IgE level, whilst IL-4 was significantly reduced and IL-2 was significantly increased after BCG vaccine. Peak expiratory flow rate (PEFR) was significantly improved in group 1 after 8 weeks of BCG vaccination (p <0.01) with positive correlation with IL-2 [(r = 0.60202, p<0.05) (r = 0.628621, p<0.01)] and with negative correlation with IL-4 [(r = 0.65331, p< 0.01) (r =0.62137, p<0.01)] before & after BCG vaccine respectively.

Conclusion: BCG vaccination might improve atopic asthmatic patients probably due to down regulation of a Th2 immune response and this suggests its potential role as a useful therapeutic agent in the treatment of atopic asthma.

Keywords: BCG Vaccine, asthmatic, allergy
INTRODUCTION

The recognition of the divergence of TH cells into predominantly two arms, TH1 and TH2 subsets that are largely mutually exclusive and reciprocally regulated has decisively improved our understanding of the mechanisms that contribute to the pathogenesis of many chronic diseases. An increasing body of evidence from mice and humans now supports the concept that the predominance of either reciprocally regulated subset may result in certain chronic diseases.

It is well known that TH2 cells play an important role in the asthmatic mechanisms as they secrete both IL4 which stimulate IgE production and IL5 which activate eosinophils. Alternatively, TH2 cells have a reciprocal inhibition of TH1 cells which produce IFN-γ, the latter has inhibitory action on the IgE production.

In the recent decades, there has been an increase in severity and probably in prevalence of atopic disorders including asthma in developed countries. Studies on migrants from developing to developed countries support the importance of etiological environmental changes.

Childhood respiratory infections that might strongly modify the developing immune system both systematically and within the lung include measles, whooping cough and tuberculosis. Some of these infections cultivate a TH1 immunological environment with its predominant cytokines. Because these cytokines inhibit TH2 cytokine functions, the absence of these infections might release TH2 immune mechanisms and thus promote atopic disorders.

So it is likely that a set of specific infections especially tuberculosis that strongly promote TH1 immunity has the potential to inhibit atopic disorders by the repression of TH2 immune response.

As the new strategies in treating allergic diseases including bronchial asthma are directed towards using agents that decrease IgE levels or TH2 cytokines production or increase TH1 cytokines production in order to inhibit the allergen induced eosinophilic recruitment. So, we hypothesize that a vaccine that induces a strong TH1 immune response and a long living memory immunity might prevent the establishment of a biased TH2 cytokine milieu in the lungs of genetically predisposed subjects, and as BCG vaccine is a potent adjuvant for induction of cell-mediated immunity and induces IFN-γ as one of the major cytokines, this action may cause a TH1 type immune response.

Consequently, this study was conducted aiming to investigate the action of BCG vaccine in adult asthmatic patients through immunization schedules in attempt to modulate the immune deviation away from atopy and thereby interfering with the pathogenesis of this disease.

MATERIALS AND METHODS

This study included 34 adults asthmatic patients selected from Ain Shams Allergy and Immunology outpatient clinic.

Group I: 16 asthmatic patients with positive skin prick test to one or more allergens.

Group II: 18 asthmatic patients with negative skin prick test.

Both groups were receiving conventional therapy without systematic corticosteroids.

Group III: 21 adult healthy controls with no history of any chronic medical illness.
For all subjects the following were done;

1. Detailed medical history and clinical examination including history of allergy and previous T.B. infection.
2. Tuberculin Test using purified protein derivative (PPD) obtained from (ACSERA), which was injected intradermal on the dorsal side of right forearm and after 48-72 hours the size of the induration was measured. The test was considered.

- Positive (converted) when the induration was ≥ 10 mm in diameter.
- Intermediate (5-9 mm)
- Negative no reaction or <5 mm

Table 1: Results of tuberculin test before BCG vaccination

<table>
<thead>
<tr>
<th></th>
<th>Positive</th>
<th>Intermediate</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I</td>
<td>1</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>Group II</td>
<td>3</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>Group III</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
</tbody>
</table>

Subjects with negative and intermediate tuberculin test were included in the study while subjects with positive tuberculin test were excluded.

For the included subjects (15 in each group) BCG vaccine (obtained from ACSERA) was injected intracutaneously as 0.1 ml in the proximal lateral part of left upper arm. Successful vaccination was identified by ulceration and secretion at the site of vaccination beginning 2 weeks after vaccination and lasting 2-6 weeks with no lymphadenitis or serious side effects recorded.

For the three groups the following tests were performed before and after 8 weeks of BCG vaccination:

1. PEFR (Peak expiratory flow rate) using peak flow meter
2. Circulating total serum immunoglobulin E (s IgE ) by ELISA
3. Serum interleukin 4 (S. IL4)
4. Serum interleukin 2 (S. IL2)

Step 3 & 4 were done using the commercially available kits from (DIACLONE RESEARCH FRANCE) using ELISA technique according to the instructions inserted.

Both groups of asthmatic patients were maintained on conventional asthma therapy of bronchodilators and inhaled steroid and all through the study period no one needed oral or parenteral steroid therapy.

**STATISTICAL METHODS**

The data were collected and processed to a personal computer (P.C) IBM compatible and then the data was analyzed with the aid of the program (SPSS) Statistical package for social science version 6.0 for windows.

The statistical tests used in this study are: student “t” test and Pearson correlation coefficient test “r”. P value < 0.05 was considered significant.
RESULTS

The results of tuberculin test before BCG vaccination showed that positive test was reported in only one patient of extrinsic asthma (6.67%) and reported in 3 patients of intrinsic asthma (16.67%) but 6 healthy controls showed positive tests (28.8%).

Group I (extrinsic asthma): they were 6 males (40%) and 9 females (60%) their ages ranged from 19 to 51 years with mean 34.4 ± 8.76 years.

Group II (intrinsic asthma): they were 7 males (46.5%) and 8 females (53.5%) their ages ranged from 17 to 53 years with mean 35.7 ± 9.19 years.

Group III (controls): they were 7 males (46.5%) and 8 females (53.5%) their ages ranged from 16 to 49 years with mean 35.7 ± 9.19 years.

The results of serum total IgE, IL2 and IL4 of the different groups before BCG vaccination were as follows:

Group I serum total IgE ranged from 105 to 630 IU/L with mean 384.06 ± 131.122 IU/L. Serum IL4 ranged from 14 to 122 pg/ml with mean 78.2 ± 31.46 pg/ml and serum IL2 ranged from 6.5 to 14.2 pg/ml with mean 9.97 ± 3.19 pg/ml.

Group II serum total IgE, ranged from 65 to 270 IU/L with mean 142 ± 56.91 IU/L serum IL4 ranged from 14 to 122 pg/ml with mean 12.4 ± 4.5 pg/ml and Serum IL2 ranged from 12 to 24 pg/ml with mean 17.73 ± 3.15 pg/ml.

Group III serum total IgE ranged from 45 to 180 IU/L with mean 102.8 ± 39.07 IU/L, serum IL4 ranged from 3 to 14 pg/ml with mean 6.66 ± 3.68 pg/ml and Serum IL2 ranged from 12 to 33 pg/ml with mean 22.86 ± 6.55 pg/ml.

Table 2: Mean of serum total IgE

<table>
<thead>
<tr>
<th></th>
<th>Group I</th>
<th>Group II</th>
<th>Group III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>34.3± 8.76</td>
<td>35.7± 9.19</td>
<td>35.71± 9.1</td>
</tr>
<tr>
<td>Mean serum. IgE (pg/ml)</td>
<td>384.06 ± 131.122</td>
<td>142± 56.91</td>
<td>102.8 ± 39.07</td>
</tr>
<tr>
<td>Mean serum. IL4 (pg/ml)</td>
<td>78.2± 31.46</td>
<td>12.4 ± 4.5</td>
<td>6.66 ± 3.68</td>
</tr>
<tr>
<td>Serum. IL2 (pg/ml)</td>
<td>9.97± 3.19</td>
<td>17.73± 3.15</td>
<td>22.86± 6.55</td>
</tr>
</tbody>
</table>

In all subjects the reactions to BCG vaccine were successful after 2 weeks and lasting 2-6 weeks with no lymphadenitis or serious side effects. When reevaluation of patients and control subjects were done (mm in diameter).

Table 3 Results of tuberculin test after BCG vaccination

<table>
<thead>
<tr>
<th></th>
<th>Positive</th>
<th>Intermediate</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I</td>
<td>9</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Group II</td>
<td>10</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Group III</td>
<td>11</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>

Regarding the results of serum IgE, IL4 and IL2 after BCG vaccination

Group I, serum total IgE ranged from 100 to 525 IU/L with mean 329.53 ± 95.79 IU/L (i.e.) Serum IgE was significantly decreased after BCG vaccination (P<0.05).
Serum IL4 ranged from 25 to 130 pg/ml with mean 61.6 ± 30.3 pg/ml being significantly decreased (P < 0.05) Serum IL2 ranged from 12 to 23 pg/ml with mean 15.26 ± 5.45 pg/ml being highly significantly increased (P > 0.01).

Group II, serum total IgE ranged from 60 to 250 IU/L with mean 138.4 ± 50.58 IU/L which showed no significant difference between pre or post BCG vaccination (P >0.05).

Serum IL4 ranged from 6 to 14 pg/ml with mean 8.5 ± 4.48 pg/ml being significantly decreased after vaccination (P < 0.05). After BCG vaccination by 2 months it was found that:

Serum IL2 ranged from 21 to 39 pg/ml with mean 23.86 ± 9.25 pg/ml being significantly increased after vaccination (P < 0.05).

Group III, serum total IgE ranged from 40 to 170 IU/L with mean 100.13 ± 38.16 IU/L with no significant difference between pre or post BCG vaccination (P <0.05).

Serum. IL4 ranged from 2 to 7.5 pg/ml with mean 4.13 ± 1.89 pg/ml with no significant difference also (P> 0.05).

Serum IL2 ranged from 17 to 39 pg/ml with mean 28.86 ± 6.34 with a significant increase in Serum IL2 post BCG vaccination (P <0.05).

### Results of tuberculin test after 2 months of BCG vaccination

PEER were recorded for the studied subjects at the start of the study (PEEROW), after two weeks of BCG vaccination (PEER 2W), after 4 weeks (PEER4W), and at the end of the study period i.e. after 8 weeks (PEER 8W), to report for the time of maximum improvement.

<table>
<thead>
<tr>
<th></th>
<th>PEER OW</th>
<th>PEER 2W</th>
<th>PEER 4W</th>
<th>PEER 8W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I</td>
<td>55.93± 7.68%</td>
<td>54.7 ±7.44%</td>
<td>60.2 ±5.38%</td>
<td>65.13 ± 4.45%</td>
</tr>
<tr>
<td>Group II</td>
<td>53.73± 7.1%</td>
<td>53.26 ±5.18%</td>
<td>55.93±5.39%</td>
<td>57.13± 5.02%</td>
</tr>
<tr>
<td>Group III</td>
<td>95.33 ± 5.13 %</td>
<td>94 ± 3.68 %</td>
<td>95.06 ±4.26%</td>
<td>95.73± 3.50%</td>
</tr>
</tbody>
</table>

Table 5. Results of serum. Total IgE, serum IL4 and serum IL2 before and after BCG vaccination in various groups

<table>
<thead>
<tr>
<th></th>
<th>Group I Before</th>
<th>After</th>
<th>Group II Before</th>
<th>After</th>
<th>Group III Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total S.IgE IU/L</td>
<td>384.06 ± 131.122</td>
<td>±</td>
<td>142 ± 56.93</td>
<td>± 50.58</td>
<td>102.8 ± 39.07</td>
<td>± 38.16</td>
</tr>
<tr>
<td>P=0.05</td>
<td>P&gt;0.05</td>
<td></td>
<td>P&gt;0.05</td>
<td></td>
<td>P&gt;0.05</td>
<td></td>
</tr>
<tr>
<td>IL4 PG/ML</td>
<td>78.2 ± 31.46</td>
<td>±</td>
<td>12.4 ± 4.5</td>
<td>± 4.48</td>
<td>6.66 ± 3.68</td>
<td>± 1.89</td>
</tr>
<tr>
<td>P&lt;0.05</td>
<td>P&lt;0.05</td>
<td></td>
<td>P&gt;0.05</td>
<td></td>
<td>P&gt;0.05</td>
<td></td>
</tr>
<tr>
<td>IL2 PG/ML</td>
<td>9.97 ± 3.19</td>
<td>±</td>
<td>17.73 ± 3.15</td>
<td>± 9.25</td>
<td>22.86 ± 6.55</td>
<td>± 6.34</td>
</tr>
<tr>
<td>P&lt;0.01</td>
<td>P&lt;0.05</td>
<td></td>
<td>P&gt;0.05</td>
<td></td>
<td>P&gt;0.05</td>
<td></td>
</tr>
</tbody>
</table>
Figure 1: Comparison between mean Serum. Total IgE before and after BCG vaccination in various groups.

Figure 2: Comparison between mean Serum. IL4 before and after BCG vaccination in various groups.
Figure 3: Comparison between mean S. IL2 level before and after BCG vaccination in various groups.

PEER was significantly improved after 8 weeks of BCG vaccination in group I (P<0.05), while PEER in group II after 8 weeks of BCG vaccination was improved but not statistically significant, PEER. In group III after 8 weeks of BCG vaccination PEER showed no statistically significant change.

At the start of the study, in the extrinsic asthmatic group a significant positive correlation was found between PEER and IL2 (r= 0.60202) P < 0.05. Also a highly significant negative correlation was found between PEER and IL4 (r= -0.65331) P <0.01. These correlations were maintained after BCG vaccination as we found that the correlation between PEER and IL2 was statistically highly significant positive correlation (r= 0.628621) P <0.01, and the correlation between PEER and IL4 was statistically significant negative correlation (r= -0.62137) P <0.01.

DISCUSSION

TH2 responses predominate in individuals suffering from atopic disorders\textsuperscript{3}. Atopic disorders, in particular, asthma, are steadily increasing (Cookson and Moffatt. 1997)\textsuperscript{4}. The reasons for the increase are not fully known although it has been noticed that the increase in atopic disorders inversely correlated with a steady decline in the extent to which the population is exposed to major human diseases such as tuberculosis, measles, whooping cough and influenza\textsuperscript{18,19}.

One of the general features of these infectious agents is that they induce characteristic TH1 type immune response which leads to an immunological environment rich in IFN-\(\gamma\).\textsuperscript{20}

As IFN-\(\gamma\) is viewed as powerful suppressive mediator of TH2 activity, the lack of frequent exposure to such infections has been proposed to be related to a failure of regulatory T cells (T_{reg}) cell development, resulting in a loss of tolerance to allergens\textsuperscript{21} Speculated to increase the risk of developing atopy.

Atopic asthma and pulmonary tuberculosis appear to be inversely related disorders\textsuperscript{7,22}. predominance of TH2 cytokine cells has been demonstrated in BAL of patients with atopic asthma, whereas in BAL from patients with pulmonary tuberculosis, a predominance of TH1 cells has been found\textsuperscript{11}. 

![Graph showing comparison between mean S. IL2 level before and after BCG vaccination in various groups.](image-url)
The issue of how TH1 cells induced by M. tuberculosis can regulate TH2 cells against distinct antigens has been by

Previous reports have provided convincing evidence for an inverse association between tuberculin responses and atopic disorders and this agree with the findings in this work as, at the beginning of this study only one patient of the extrinsic asthma group (6.67%) and 3 patients of the intrinsic asthma group (16.67%) showed positive tuberculin test, while 6 healthy controls showed positive tests (28.8%).

The idea that the TH1/TH2 balance could be affected by vaccination with relevant micro-organisms or microbial components is another logical consequence of the current knowledge of the TH1/TH2 paradigm. In that regard, Mycobacterium tuberculosis is one of the most potent immunomodulatory microorganisms and could be expected to strongly effect the cytokine milieu in the lung.

The adaptive immune response to allergens and mycobacteria is initiated by DCs. Pattern recognition receptors, including Toll-like receptors (TLRs), on the surface of the DCs recognize foreign material and phagocytose it, or transduce signals into the DCs. T cell receptors recognize the presented fragments of the foreign material on MHC class II of the DCs (signal 1), and co-stimulatory molecules, such as CD80/86 expressed on the cell surface of activated DCs, interact with ligands (such as CD28) on the T cell surface (signal 2). At the same time, polarizing molecules, such as IL-12 produced by DCs (signal 3), determine the type of T cell responses needed. Mycobacterial products are recognized by TLR2 and TLR4, which lead to secretion of IL-12 and IL-10 from DCs, and the development of Th1/Treg cells. MBP70, a major secreted protein of BCG, and mycolic acid, a cell-wall component of BCG, effectively suppressed asthmatic reactions in murine models. Although the findings by Kim et al are rare one showing a suppressive effect of BCG-treated DCs on asthma, live BCG vaccination and administration of BCG-treated DCs naturally work in the same manner, because BCG produces adaptive immunity through DCs.

However these data could not confirm that mycobacterium tuberculosis reduce predisposition to atopy as the predisposition genetic factors are the most contributing factors to the susceptibility for atopy.

In this study, we addressed the question of whether the BCG vaccination can suppress the development of TH2 responses in adult asthmatic patients with the resultant improvement of asthma symptoms.

At the start of this study, extrinsic asthmatic patients showed a high level of serum IL4 compared to the intrinsic asthmatic group (P< 0.01) and a low level of serum of IL-2 compared to the intrinsic asthmatic group (P< 0.01).

After BCG vaccination serum levels of IL-4 decreased significantly in the extrinsic asthmatic group P <0.05, also decreased significantly in the intrinsic asthmatic group P<0.05, while serum levels of IL-2 showed highly significant increase in the extrinsic asthmatic group P<0.01, and a significant increase in the intrinsic asthmatic group P<0.05 while Serum levels of total IgE showed significant decrease in the extrinsic asthmatic group P<0.05, with no significant change in the intrinsic asthmatic group.

These findings proved that after 8 weeks of BCG vaccination in the asthmatic groups, significant polarized TH1 response was detected by the increase of serum, IL2 with decrease of TH2 response in asthmatic patients as detected by serum, IL4 level reduction.

Improvement of pulmonary function PEFR in the extrinsic atopic asthmatic patients after BCG vaccination was much significant than that in the intrinsic non atopic asthmatic patients probably due to the reduction of a TH2 immune response. This suggests the potential pathologic role of TH2 immune response in atopic asthma, and this was proved in this study by the highly significant positive correlation found, after BCG vaccination between PEFR and serum level of IL-2 and the highly significant negative correlation between PEFR and serum level of IL-4.
Based on the results obtained the most likely explanation is that TH1 cytokine profile induced by BCG could suppress homing, development or expression of TH2. Ria, et al\textsuperscript{29} published a report showed that IL4 down regulate expression of IL12 and suggested that this down modulation lead to generation of TH2. But the presence of IFN-\textgreek{y} mediated inhibits this IL4 induced effect consequently. This leads to development of TH1 response. So, the observed strong inhibition of TH2 effect response could be due IFN-8\textsuperscript{30}.

The balance between IFN-\textgreek{y} and IL4 represents a site for T. cell activation and determines whether TH1 and or TH2 cells are generated\textsuperscript{31}.

Infection with respiratory syncytial virus which induces transient increase of IFN-\textgreek{y} did not inhibit TH2 immune response in the airways. Therefore, inhibition of TH2 immune response might therefore be limited to infections that induce strong and relatively long lasting TH1 response\textsuperscript{32}.

The skewing toward TH1-dominant responses caused by the presence of M. tuberculosis was suggested to be mediated by IL-12. In mice IL-12 treatment has been reported to abrogate antigen induced pulmonary eosinophilia\textsuperscript{33}.

Mycobacteria elicit particularly strong protective TH1 immune responses. Mycobacterial lipoproteins bind to macrophage which carry T cell-like receptors (TLRs) and this interaction leads to prominent synthesis of IL-2, and hence prominent TH1 switching and secretion of interferon (IFN-\textgreek{y}) and tumour necrosis factor (TNF-\textalpha). These cytokines, repress TH2 immune mechanisms both in vivo and invitro experiments\textsuperscript{29,34}.

Researches using mycobacterial product-pulsed DCs or DCs co-cultured with allergens and BCG were done\textsuperscript{28, 29, 35-39}. Co-administration of \textit{Dermatophagoides farinae} and BCG to DCs increased the efficiency of IL-10 production from DCs, and effectively decreased IL-5 production from T cells, probably because the allergen and BCG were simultaneously recognized by the same DCs. In addition, co-pulsing of DCs with unrelated antigens may have a mutual helper effect\textsuperscript{28}.

Repression of TH2 immune mechanisms and hence atopy by mycobacterial exposure therefore appears possible.

In view of previous studies the most likely explanation for the results of this work is that the activation of TH1 cells with production of IL2 and INF following active BCG vaccination blocked the expansion of TH2 secreting IL4 as also suggested before by Robinson et\textsuperscript{40}, Ria et al\textsuperscript{29}, Erb et al\textsuperscript{41}.

\textbf{RECOMMENDATIONS}

1. Follow up of these groups of asthmatic patients is recommended examining the levels of the IL2, IL4 and IgE to study for how long the immunological effect of BCG vaccination can be maintained in this preliminary study.

2. BCG vaccination of children early in life may potentially be helpful in reducing the risk of developing atopic asthma.
REFERENCES

Residual Intradural Oil-based Contrast Agent: A Case Report

Vilas Kanikadaley*
Department of Radiology, GMC Hospital, Fujairah, UAE

ABSTRACT
A 53 yr. Syrian male presented with frontal headache for 2-3 months. Upon examination, no positive finding were present. The haematological tests were also normal. Pt. was advised Plain radiography of Paranasal sinuses and skull. It revealed hypodense dots in rt. Frontal region and skull base. Cloudy frontal sinuses were suggestive of sinusitis. CT brain with contrast was carried out for further evaluation. Hyperdense dots were seen in cerebral basal cisterns and cervical spinal canal. Thoracolumbar spine was carried out for further confirmation of presence of similar hyperdense dots in spinal canal. It also revealed similar tiny radio-opaque dots in spinal canal. On Anamnesis, pt. revealed that he had undergone Myelography with an oil based contrast at the age of 18 yrs. (34yrs. ago) for Lumbar disc disease. These radio-opaque dots were residual oil-based contrast agent and were an incidental presentation.

Key words: Residual intradural contrast, Myodil, Pantopaque
**INTRODUCTION**

Myodil /Pantopaque (Iophendylate is a fatty acid) is an oil based positive contrast media which was introduced by Steinhausen for Myelography in 1944. This was commonly used till 1980 for Myelography, Cisternography & Ventriculography and was replaced by water soluble media due to its complication and sequelae. Oil based contrast media was known to have extremely slow clearance rate from cerebrospinal fluid. Although rare, remnants of contrast agent used more than 3 decades ago are still encountered clinically. We present this case to increase awareness amongst Clinicians and Radiologists of this incidental finding on x-ray. This contrast may simulate intraspinal fat or hemorrhage on MR imaging.

**CASE REPORT**

53yr. Male, retired army officer, Syrian born presented in medicine OPD of GMC, Fujairah. The main complaint of patient was of mild headache in frontal region for 3 to 4 months off and on. There was no history of fever, vomiting, giddiness or vision defect. Past history was unremarkable except mild allergy to dust and had taken treatment for such headaches. There was no local tenderness or swelling. On clinical examination-BP 130/80mmhg., Pulse 70 per/min., Respiration normal. Nothing abnormal detected on CNS, Per-abdomen, CVS & Chest examination. Routine blood and urine tests were normal. Pt. was advised water’s and lateral view ski grams for Para nasal Sinuses. (Figure1 & 2)

**RADIOLOGICAL FINDINGS**

Plain Skiagrams of Paranasal sinus

![Images of Paranasal sinuses](image1.png)

*Figures. 1 & 2-Waters’ view and lateral skull*

**Report-** Multiple almost rounded calcified shadows seen intracranial. Advice CT BRAIN.
CT BRAIN

On the basis of x-ray report, Pt. was advised Plain and Contrast Enhanced CT Brain. (Fig.3, 4, 5, 6, 7, 8, 9).

PLAIN CT PNS AND BRAIN

Figure 3

Figure 4

Figure 5

Figure 6

Figure 7
CT REPORT

HYPOPLASTIC SEPTUM PELLUCIDUM. THIS IS OF NO CLINICAL SIGNIFICANCE. (ANATOMICAL VARIATION). OLD RESIDUAL RADIOLOGY MYODIL CONTRAST USED FOR MYELOGRAPHY NOTED IN SUBARACHNOID SPACES AND FISSURES OF BRAIN. THIS IS OF NO CLINICAL SIGNIFICANCE.

WOULD REQUEST THORACOLUMBAR SPINE SKIAGRAMS TO CONFIRM THE RESIDUAL MYODIL CONTRAST.
On the basis of CT report, Pt. was advised plain Skiagram of Thoraco-Lumbar Spine. (Figures 10&11).

**REPORT**

MILD DEGENERATIVE CHANGES IN THORACIC AND LUMBAR SPINE SEEN. OLD RESIDUAL RADIOPAQUE MYODIL CONTRAST OF MYELOGRAPHY SEEN IN THECAL SAC

**DISCUSSION**

A radiographic contrast medium Myodil (iophendylate) manufactured by Glaxo Laboratories UK and also known as Pantopaque in USA was extensively used from 1946 to 1988 for Myelography, Ventriculography and Cisterngraphy. The use of Myodil is discontinued for more than 25yrs hence we rarely encounter this oil based contrast in clinical imaging. This oil based contrast media is absorbed and excreted very slowly from the body hence extremely slow rate of clearance. This concerns about the development of acrachnoiditis. Pantopaque is well known for its ability to create both clinical and subclinical arachnoid reactions. Pantopaque has been known to be cleared by a process in which the dye is encysted in the subarachnoid space in approximately 6 days and absorbed at a rate of 0.5–3 cc per year. Myodil trapped in
subarachnoid and cisternal spaces usually remains clinically silent and gradually spreads along the nerve roots with the aid of gravity and finally vanishes. Myodil can persists within the central nervous system, particularly in the basal cisterns and the Lumbosacral thecal sac, as either encapsulated droplets, which may calcify, or remain as a thin film. The thin film of contrast would be more likely to cause a diffuse reaction and possibly a systemic toxic reaction. In our case, these droplets were seen in basal & prepontine cisterns and spinal canal. Our pt. gave history of injection in lumbosacral region at the age of 19yrs 34yrs.ago) which was performed to exclude slip disc.

Residual oil based contrast has been implicated in causing chronic headaches and focal seizures. In 1982, Avrahami and Cohen published an article in German concerning post-myelography headaches persisting for more than 6 months. The authors suggested that these were the result of residual Pantopaque causing blood vessel irritation. In our case, frontal headache was for 3-4 months and pt. was allergic to dust. In our case, pt. had headache for short period and got relieved with appropriate treatment.

Contrast can be seen as remnants in imaging studies of the brain or spinal cord, such as CT or MRI even after years. On MRI, the characteristics of Myodil, Pantopaque, Iophendylate either retained in subarachnoid space or trapped in subdural space produces the intensity pattern similar that of fat and subacute blood (met-HB). It mimics like Lipoma or Subacute Hemorrhage on MRI on T1 & T2 images. (Figures 12 &13).

(From Imaging Features of Retained Subdural Pantopaque 28 Years after Myelography, Abolfazl Rahimizadeh, Ava Rahimizadeh : Department of Neurosurgery, Pars Hospital, Tehran, Islamic Republic of Iran. 16 World Spinal Column Journal, Volume 3 / No: 1 / January 2012.)
Our case suggests that Myodil trapped in the subdural space might remain unchanged for a long period of time and may be incidentally seen on ski grams obtained for other clinical condition. The easiest way to diagnose intrathecal Myodil is taking a careful history and its demonstration on plain radiographs. This case emphasizes the necessity of awareness about these rare features which continue to present even decades after abandonment of oil-based myelography.

CONCLUSION
Remnants and complications of Myodil / Pantopaque can still be seen in clinical practice and may be misinterpreted as disease. When atypical radiological findings similar to our patients are encountered, physicians should consider that they may be a rare presentation of remnants of Myodil/Pantopaque. Proper history confirms residual contrast media.

REFERENCES
Assessment of the Utilization Pattern and Related Knowledge of Nasal Decongestants among University Students in Ajman, UAE

Gill SN1, Al Sallom JM1*, Adamu NS1, Ferej RA1, Alagheband Z1, Mustapha H1, Al-Sharbatti S2, Jing M3, Annie S4

1College of pharmacy/Pharm D student, 2College of Graduate Study/ Department of Community Medicine, 3College of medicine/Department of Community Medicine, 4College of pharmacy, Gulf Medical University, Ajman, UAE

*Presenting Author

ABSTRACT

Objectives: 1. To assess the utilization pattern of nasal decongestants among University students in Ajman, UAE. 2. To assess the students’ knowledge related to the use of nasal decongestants. 3. To evaluate the factors related to the nasal decongestant use.

Materials and Methods: A cross sectional study was carried out using a validated, self-administered questionnaire which addressed socio-demographic details and information about knowledge and practice related to use of nasal decongestants. A scoring system assessed knowledge; median knowledge score was used as a cut-off value to identify adequacy of knowledge.

The SPSS version 21 was used to analyze the data and Chi-square test was used to test the significance of association. A p-value of <0.05 was accepted as a significant level.

Results: The study included 440 respondents who were mostly females (75%), medical students (34%), from junior batches (53%), students living with their family (57%) and students without health insurance (52%). Majority of the respondents admitted that they had no knowledge or little knowledge regarding the use of nasal decongestants (64%). A lower knowledge score was observed in females as compared to males (54% Vs 51%, P>0.05). This was observed to be similar with junior students (p=0.001). Significant association was found between knowledge score and program (P=0.02). The use of nasal decongestants as reported by 70% of respondents was found to be almost the same for participants below and above 20 years (70% Vs 69% ), for junior students (P=0.002) and for those with health insurance ( 74% Vs 68%). Significant association was found between nasal decongestants use and program of study (P<0.001).

Conclusion: Majority of the respondents had poor knowledge about nasal decongestants. The knowledge and the usage were significantly associated with the program of study. Junior students displayed lower knowledge and higher usage of nasal decongestants as compared to their seniors.

Keywords: Nasal decongestant, knowledge, use, related factors
INTRODUCTION

Nasal decongestants are medications commonly used for the relief of nasal and sinus congestion, seasonal rhinitis, common cold and allergic rhinitis. Allergic rhinitis is an illness that affects around 10% to 20% of the world’s population, and 15% to 25% of children and adolescents.

In some patients, a change in humidity, temperature, or exposure to cold or dry air can cause the nasal symptoms that cause congestion and rhinitis such as nasal blockage, sneezing, running nose, and irritation. There are different dosage forms of nasal decongestants, viz. topical, spray, tablets and syrups, which are all used in relieving pain and stuffiness of nose, the oral nasal decongestants take approximately 15-30 minutes to produce their action, while the topical decongestants are much faster.

Over-the-counter nasal decongestants are most frequently used to overcome symptoms like sneezing and running nose. Decongestants improve the nasal ventilation and drainage by causing vasoconstriction, thereby reducing congestion and edema of the nasal mucosa. Oral and topical decongestants such as pseudoephedrine/phenylephrine may in short-term relieve nasal blockage associated with the common cold. A 2007 meta-analysis on the effects of this type of decongestants in common cold evaluating five studies that involved 286 adult patients suggested a net (6%) decrease in the subjective symptoms after a single dose of decongestant comparable to the use of a placebo. This result was further supported by a net significant reduction in nasal airways resistance in patients who have been treated with decongestants. Repeated doses of the nasal decongestants produced a small and perhaps clinically insignificant benefit (around 4%) from repeated use continued over 3-5 days.

The most effective drugs used for nasal congestion include phenylephrine, pseudoephedrine, oxymetazoline, naphazoline, and xylometazoline. Tablet dosage forms, mostly a combination of decongestants and antihistamines (e.g. Cetirizine, tripolidine, and dimethindene) provide symptomatic relief in allergic conditions. The utilization of nasal decongestants differs from person to person and depends on the brand. Most commonly used brands include, Actifed, Cirrus, Panadol cold & flu day, Sapofen, Ocean Spray, and Clarinase.

Many clinical trials done to test the validity of nasal decongestants action also show a range of side effects that may occur patients using these drugs. Common side effects that may occur are headache, nausea, tachycardia and change in blood pressure (phenylephrine action), nervousness, tinnitus, sedation and drowsiness (tripolidine action), and stinging of nasal mucosa. Prolonged use of nasal decongestants may have harmful side effects, e.g. iatrogenic rhinitis. Studies have shown that prolonged use of either topical or systemic nasal decongestants for more than 3-5 days may cause rebound congestion.

Studies have shown that the utilization pattern differs from patient to patient depending on the patients’ knowledge about the nasal decongestant being used, their background information about the medication and its side effects and regarding the number of days for which it can be taken.

A study by the School of Health and Related Research has shown that nasal decongestants are a group of drugs that have been misused or abused by patients. This study has recognized that such drugs under the term of over-the-counter (OTC) medicines have the potential for harm as a result of misuse. Among the nasal
decongestants used, Phenylephrine was observed to be the most frequently used decongestant (72.2%) followed by Pseudoephedrine (12.9%).

Despite the fact that people use nasal decongestants, little consideration has been given to the pattern of utilization or to the magnitude with which nasal decongestants could affect the health of individuals. Available data show a high frequency of nasal decongestants over-use among universal student from health sciences and although researchers found that self-medication among people using nasal decongestants is common in UAE, little data are available from the UAE regarding the utilization pattern of nasal decongestants. Moreover, health care professionals have the obligation to educate people while they practice their jobs, and to do so they should have prior knowledge about the nasal decongestant used by them, so as to tackle related misconceptions.

This study will increase the awareness of health science students about the nasal decongestants, and can help in developing future education session that will focus on the identified gap in knowledge and related education needs.

MATERIALS & METHODS

- Research design: A cross-sectional study
- Study population: The study involved the students of Gulf Medical University, Ajman.
- Inclusion criteria
  - Male and female students from MBBS, Pharm D, DMD, BPT, BHS & BBMS Programs in GMU who are available in GMU Campus at the time of data collection.
  - Age ≥ 18 years.
  - Students that accept to give informed consents
- Exclusion criteria
  - Age <18 years.
  - Students that refuse to sign the consent form
- Sample size calculation
  - The sample size required was calculated based on the frequency of correct knowledge of nasal decongestants (32.9%) reported in another study from the Brazilian Journal of Pharmaceutical Sciences. A minimum sample size of 339 students using the convenience sampling technique was calculated using the formula:

\[
n = p(1 - p)\left(\frac{Z^2}{E}\right)^2
\]

Where
- P: Population Proportion (0.3)^2
- E: Marginal Error of estimate
- Z: Z value at the 95% Confidence level=1.96
- Study settings: Gulf Medical University Campus
- Duration of study: 3 months (October-December 2014)
- Study instrument & validation procedure
  - Self-administered questionnaires were used as a tool.
  - The questionnaires included 3 domains: socio-demographic factors, knowledge and utilization pattern.
• Validation of the questionnaire was done by two faculties from the Community Medicine Department and the College of Pharmacy.
• After validation, the tool was pilot tested for feasibility and for clarity of questions including 5-10 students.
• Data from the pilot study was included in the final results.

❖ Ethical issues

• The study was conducted after getting the approval from the Ethics committee of GMU.
• An informed consent was taken from the participants before they take part in the study.
• Confidentiality of the participants and the research information was assured.
• The information collected will only be used for research purpose.
• Only the Research team, Ethics Committee of GMU, Community Medicine Department and Statistical Support Division CABRI will have access to the information collected.
• The study related documents will be kept locked for 3 years as per GMU policy in the Department of community medicine.

❖ Methodology

• After the approval of our research proposal by the Ethics Committee of GMU, official approval for data collection was taken from the identified Colleges. Dates were assigned for data collection.
• After explaining the purpose of our study, self-administered questionnaires were handed out to the participants, using the convenience sampling technique.

DATA ANALYSIS
The data collected were compiled into an Excel spreadsheet, analyzed using the SPSS version 21 and finally, the data were presented in the form of tables and graphs. For associations, Chi square test was used. A scoring system was used to assess the knowledge; Participants whose knowledge score ≥ the average score were considered to have adequate knowledge.

RESULTS
The study included 440 participants who were mostly females (75%), from Eastern Mediterranean Region countries (37%), students in the MBBS programs (34%), students of the junior batches (53%), living with their families (57%), and have no insurance (52%), as shown in table-1.

Table 1: Socio-demographic characteristics of the participants

<table>
<thead>
<tr>
<th>Socio-demographic factor</th>
<th>Sub-category</th>
<th>Number of students</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nationality</td>
<td>African Region</td>
<td>110</td>
<td>25.5</td>
</tr>
<tr>
<td></td>
<td>South-East Asia Region</td>
<td>120</td>
<td>27.8</td>
</tr>
<tr>
<td></td>
<td>Eastern Mediterranean Region</td>
<td>159</td>
<td>36.9</td>
</tr>
<tr>
<td></td>
<td>Other*</td>
<td>42</td>
<td>9.7</td>
</tr>
<tr>
<td>Programs</td>
<td>MBBS</td>
<td>148</td>
<td>33.8</td>
</tr>
<tr>
<td></td>
<td>Pharm D</td>
<td>98</td>
<td>22.4</td>
</tr>
</tbody>
</table>
Figure 1: Shows the student perception of their nasal decongestant knowledge. Majority of the respondents admitted that they had no knowledge or little knowledge (63.8%).

Analysis of knowledge scores showed that the number (%) of student who had low and adequate knowledge scores were 382 (86.8%) and 58(13.2%) respectively.

Distribution of participants by socio-demographic characteristics and the knowledge scores was shown in table 2. Low knowledge was found more commonly in males in comparison to females (88.5% Vs. 85.6%, P>0.05), junior students (p=0.014). Higher proportion of adequate knowledge was found among students in the Pharm D program.

Only 30% of participants knew the recommended duration of nasal decongestants’ use, which is 3-5 days, and 10.7% thought it can last 2 weeks / one month. Only 59 respondents (13.7%) had heard about rebound congestion.

Nasal decongestants were used by 304 respondents (69.9%). Fig 2 shows the
most common indications for using the nasal decongestants. Common cold was the most common reason and reported by 50% of the respondents.

Table 3 shows the association between the use of nasal decongestant and socio-demographic factors. The use of nasal decongestant was found to be more common by participants aged <20 Y (70.2% Vs 68.9%), junior students (P=0.002) and those who had health insurance (74.1% Vs 67.5%). Significant association was found between nasal decongestants use and program of study (P<0.001).

Table 2: The association between knowledge and socio-demographic factors.

<table>
<thead>
<tr>
<th>Socio-demography</th>
<th>Knowledge</th>
<th></th>
<th></th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>Adequate</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Age</td>
<td>≤20</td>
<td>293</td>
<td>88.0</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>&gt;20</td>
<td>89</td>
<td>83.2</td>
<td>18</td>
</tr>
<tr>
<td>Nationality</td>
<td>African</td>
<td>59</td>
<td>90.0</td>
<td>51</td>
</tr>
<tr>
<td>(WHO Region)</td>
<td>South-East Asia</td>
<td>93</td>
<td>84.5</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>Eastern Mediterranean</td>
<td>108</td>
<td>90.0</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>European</td>
<td>137</td>
<td>86.2</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>36</td>
<td>85.7</td>
<td>6</td>
</tr>
<tr>
<td>Program</td>
<td>MBBS</td>
<td>136</td>
<td>91.9</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>DMD</td>
<td>67</td>
<td>91.8</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>PHARMD</td>
<td>78</td>
<td>79.6</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>BHS</td>
<td>20</td>
<td>83.3</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>BBMS</td>
<td>43</td>
<td>82.7</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>BPT</td>
<td>36</td>
<td>83.7</td>
<td>7</td>
</tr>
<tr>
<td>Gender</td>
<td>Males</td>
<td>92</td>
<td>88.5</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Females</td>
<td>273</td>
<td>85.6</td>
<td>46</td>
</tr>
<tr>
<td>Batch</td>
<td>Forth Year</td>
<td>18</td>
<td>66.7</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Third Year</td>
<td>79</td>
<td>87.8</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Second Year</td>
<td>76</td>
<td>90.5</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>First Year</td>
<td>200</td>
<td>87.3</td>
<td>29</td>
</tr>
<tr>
<td>Health Insurance</td>
<td>Yes</td>
<td>168</td>
<td>90.3</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>164</td>
<td>82.8</td>
<td>34</td>
</tr>
<tr>
<td>Accommodation</td>
<td>With family /relative</td>
<td>223</td>
<td>88.1%</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>With friends/hostel/others</td>
<td>141</td>
<td>84.9%</td>
<td>25</td>
</tr>
</tbody>
</table>
DISCUSSION

Nasal decongestants are commonly used medication for common cold and for allergic rhinitis with congestion and although they are safe for most patients, but their are some precautions and essential knowledge that are needed to be considered by users\textsuperscript{12,13}. Most of the current respondents evaluated themselves to have low or little knowledge with regard to nasal decongestants and this is consistent with a study from Brazil which identified insufficient knowledge among the studied participants\textsuperscript{2}. A Study
from Australia showed that 67% of respondents stated they had no or little knowledge about intranasal corticosteroid treatment for allergic rhinoconjunctivitis14.

Having correct knowledge about the recommended duration for use of the nasal decongestant is important to prevent overuse of these drugs2. Extended use of nasal decongestants can increase probability of associated side effects. Rebound congestion is one of the complications for extended use of the decongestants15. Graf P defined Rebound Congestion as “A deterioration of the feeling of nasal congestion for which topical nasal decongestants were initially prescribed during repeated use or after stopping this treatment”16.

In this study, a minimal number of the respondents (13.7%) were aware of rebound congestion. Nasal decongestants were used by about 70% of the respondents indicating the popular use of these medications. In the United Arab Emirates, nasal decongestants, at 4% were among the most commonly prescribed12. The most common indication for using nasal decongestants is common cold which is in agreement with another study that was carried out in India4.

The pattern for utilization of OTC nasal decongestants can be affected by different factors such as age, health insurance, and level of education. However, the influence of the general practitioners, (GPs) and other physicians who are treating medical condition where a nasal decongestant is part of the management; are of special importance. A study done in Singapore investigating the management of Allergic Rhinitis by general practitioners (GPs) showed that nasal decongestants were frequently prescribed by all physicians. In addition, the frequency of prescribing nasal decongestants was higher among GPs with less than 5 years of experience (96%) as compared to GPs with more than 10 years of practice (77%) (P = 0.015)17. In this study 50.4% of the students admitted that nasal decongestants were mainly recommended by the physician. Another study from Malaysia18, on the use of nonprescription medications by the general public, showed that the use of nasal decongestants ranked the third most common type (11.7%) preceded only by oral analgesics (35.9%) and cough preparations (17.2%). Similar to our finding, an aforementioned study from Malaysia did not find significant associations between the utilization of nonprescription medications and age, gender, health expenses payment (by insurance or other sources; self/government/private company).

LIMITATION

Result of this study cannot be generalized because of the nonprobability sampling method used to recruit the participants.

CONCLUSION

Majority of the respondents had poor knowledge about nasal decongestants. The knowledge and the usage were significantly associated with the program of study. Junior students displayed lower knowledge and higher usage of nasal decongestants as compared to their seniors.
REFERENCES


Prevalence and Factors Affecting Nasobronchial Allergy Among University Students In Ajman, UAE

Mohamed Tanweer Baksh1, Syed Taha Ali1, Abdel Rahman Erfan Abu Ramadan1, Hassan Jamil1, Shihab Shahidullah1, Rizwana Burhanuudin Shaikh2

1Student Phase II College of Medicine, 2Department of Community Medicine, Gulf Medical University, Ajman, UAE

* Presenting author

ABSTRACT

Objectives: The study was conducted to explore the most common allergens and common symptoms of naso-bronchial allergies and to determine the prevention and management practices of students with naso-bronchial allergies.

Materials and Methods: A cross sectional survey was conducted among 186 students of Gulf Medical University in Ajman, U.A.E. A standardized self-administered questionnaire was used to find out the prevalence of naso-bronchial allergies, allergens, aggravating factors/relieving factors, medications and preventions. Data were analyzed using SPSS-21.

Results: The majority of the students that participated in the questionnaire were of Arab and Asian ethnicity, mostly unmarried, of age group <20. 60 (30%) had some form of allergy. And 18.5% of the candidates had Naso-bronchial allergies. The leading type of Allergens was Dust accounting for 70% of the participants followed by exposure to tobacco smoke around 50-60%; and food & pollen with a rate of 31% & 30% respectively. Majority had symptoms of sneezing and runny nose followed by nose block, sore throat and throat irritation. Most of them had significant maternal history of nasobronchial allergy. 40.5% of the participants also confirmed that they had consulted a physician for their allergy in the past, while the rest 59.5% did not consult a physician. Majority of the candidates confirmed the use of nose spray and anti-histamine drugs for allergies. For the prevention methods of NBA majority of the candidates claimed to have avoided dust & sand as a prevention method, followed by keeping house clean and ventilated.

Conclusion: A larger study can be conducted to estimate the prevalence of naso bronchial allergies. And awareness should be spread to address the underlying allergen, so that it can aid people to plan better methods of preventions and help them to avoid exposure to factors which aggravate the condition.

Keywords: Nasobronchial Allergy, allergens, UAE
INTRODUCTION

The Prevalence of Naso-bronchial allergy (NBA) has drastically increased globally over the past 2-3 decades due to an alteration in the indoor and outdoor environment\textsuperscript{1,2}. And the most vital factors triggering naso-bronchial allergies are the various allergens. More than 20% of the world suffers from IgE associated allergic diseases\textsuperscript{3}. The prevalence of allergic rhinitis was 30.2% in the US and the prevalence of asthma was 22%\textsuperscript{4}. Total prevalence of allergic rhinitis in the gulf region is 36%. In the 13–19 years age group the self-reported value was greater (41%). The researchers attribute the rise in allergic rhinitis in the Gulf Arab population on the discovery of oil and the concomitant industrialized changes, rise in pollution and variations in the environmental landscape\textsuperscript{5}.

A large study initiated in the UAE (United Arab Emirates) showed an increase in the risk factors that cause allergic rhinitis and asthma in the country. Rising economy and increased population growth results in a surge of carbon emission and air pollutants leading to the deterioration of the quality of air\textsuperscript{6}. Studies of Patel A. et al\textsuperscript{1} and BH Giridhar et al\textsuperscript{2} showed the most predominant allergens to be insects following pollen and dusts and fungi\textsuperscript{1,2}. Cockroaches and mosquitoes are recognized as the most common allergen in tropical countries\textsuperscript{7}.

A study conducted in the garden city of Al Ain showed a 32% prevalence of allergic rhinitis.\textsuperscript{5} Another study conducted in the city showed that reported cases of food allergy in children was 8% with foods such as eggs, fruits and fish decidedly the main contributing factors. These allergies were also associated with a history of other atopic illnesses\textsuperscript{8}. The factors that exacerbate or aggravate the condition include psychological dysfunction, gastro-esophageal reflux, severe chronic sinus disease, recurrent respiratory infections and Obstructive Sleep Apnoea (OSA)\textsuperscript{9}.

Data on prevalence and pattern of naso-bronchial allergies is present mainly from Al Ain, however there is no published data on the prevalence of naso-bronchial allergies in the northern emirates. Therefore, the goal of the present study is to assess the prevalence of the naso-bronchial Allergy in Ajman and all the factors that induce allergy.

MATERIALS AND METHODS

A Cross sectional survey was conducted among 185 university students in Ajman UAE. Data were collected using a self-administered questionnaire The questionnaire has 4 parts: Socio-demographic details of participants, Allergens, Aggravating factors / Relieving factors, Medications and Preventions and the items on asthma were used from the ISAAC standard (free to use) questionnaire. The questionnaire was validated by subject expert from Internal Medicine and one from the Department of Community Medicine, GMU. Pilot Study was conducted on 10 participants, the results of which were used to modify and finalize the questionnaire. Anonymity was observed for all participants and their names and identity were not disclosed in the course of the study. Data were collected only from subjects who signed the consent form. The study was conducted only after getting an approval from the ethics and Research Committee of GMU.

After the approval from the Deans of all the colleges and the ethics committee, we contacted the class representatives of each college and batche and arranged an appropriate time for handing in the questionnaires in each classroom, the researchers were present during completion of the forms by the participants to clarify the doubts if any.

Data were entered on Excel and Analysis was done by SPSS program as description and inferential statistics, Chi square test was done for associations.
RESULTS
The majority of the students that participated in the questionnaire were of Arab and Asian ethnicity. Majority of the participants were mostly unmarried of age group 20 and below in their first year or second year of either MBBS, Pharm D or DMD.

Figure 1: Prevalence of Nasobronchial allergies (NBA) in the study population

Figure 1 shows that out of the 200 participants, 60 (30%) had some form of allergy. And 37 (18.5%) out of the 60 candidates have had NasoBronchial Allergy and the rest that was classified as others had skin Allergy, which hits to a count of 23 (11.5%).

Figure 2: Types of allergens

The most common allergens that caused nasobronchial allergies was found to be Dust, followed by Passive Smoking, Food and Pollen respectively.
Table 1: Association between the various allergens and nasobronchial allergy (N=37)

<table>
<thead>
<tr>
<th>NBA Allergy</th>
<th>Yes No. (%)</th>
<th>No No. (%)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pollen</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>3 (12)</td>
<td>22 (88)</td>
<td>0.978</td>
</tr>
<tr>
<td>No</td>
<td>4 (11.8)</td>
<td>30 (88.2)</td>
<td></td>
</tr>
<tr>
<td>Cats</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>8 (30.8)</td>
<td>18 (69.2)</td>
<td>0.103</td>
</tr>
<tr>
<td>No</td>
<td>29 (16.7)</td>
<td>145 (83.3)</td>
<td></td>
</tr>
<tr>
<td>Dogs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>8 (38.1)</td>
<td>13 (61.9)</td>
<td>0.032</td>
</tr>
<tr>
<td>No</td>
<td>29 (16.2)</td>
<td>150 (83.8)</td>
<td></td>
</tr>
<tr>
<td>Birds</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>3 (30.0)</td>
<td>7 (70.0)</td>
<td>0.397</td>
</tr>
<tr>
<td>No</td>
<td>34 (17.9)</td>
<td>156 (82.1)</td>
<td></td>
</tr>
<tr>
<td>Animal fur/hair</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>10 (37.0)</td>
<td>17 (63.0)</td>
<td>0.011</td>
</tr>
<tr>
<td>No</td>
<td>25 (14.6)</td>
<td>146 (85.4)</td>
<td></td>
</tr>
<tr>
<td>Smoke</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>15 (27.8)</td>
<td>39 (72.2)</td>
<td>0.040</td>
</tr>
<tr>
<td>No</td>
<td>22 (15.1)</td>
<td>124 (84.9)</td>
<td></td>
</tr>
<tr>
<td>Tobacco &amp; Smoke</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>6 (26.1)</td>
<td>17 (73.9)</td>
<td>0.391</td>
</tr>
<tr>
<td>No</td>
<td>31 (17.6)</td>
<td>145 (82.4)</td>
<td></td>
</tr>
<tr>
<td>Dust</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>28 (41.2)</td>
<td>40 (58.8)</td>
<td>0.000</td>
</tr>
<tr>
<td>No</td>
<td>9 (6.8)</td>
<td>123 (93.2)</td>
<td></td>
</tr>
<tr>
<td>Food</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>11 (35.5)</td>
<td>20 (64.5)</td>
<td>0.008</td>
</tr>
<tr>
<td>No</td>
<td>26 (15.4)</td>
<td>143 (84.6)</td>
<td></td>
</tr>
</tbody>
</table>

Table 1 shows the Cross Tabulation of all the allergens with naso-bronchial allergies showed that dust, smoke, food items and dog dander were significantly associated with naso-bronchial allergies.

The most frequent symptom was sneezing and runny nose followed by nose block, sore throat and throat irritation. Table 2 shows that majority of the participants had significant maternal history of naso-bronchial allergy and the P-Value was significant for Paternal and Sibling Family History. 40.5% of the participants also confirmed that they had consulted a physician for their allergy in the past, while the rest 59.5% did not consult a physician. Amongst the candidates that consulted a physician for their allergy, 9 out of 37 underwent a procedure to diagnose their allergy. The multiple response analysis of our research showed that majority of the people had taken medications for their allergy. The highest frequency was Ketotifen, Chlorphenaramine maleate, Brompheniramne and Pseudoephedrine followed by loratidine, majority of the participants confirmed the use of nose spray and anti-histamine drugs. For the prevention methods of NBA majority of the candidates claimed to have avoided dust & sand as a prevention method, followed by keeping house clean and ventilated (Figure 3).
Table 2: Association between family history of allergies and naso-bronchial allergy (N=37)

<table>
<thead>
<tr>
<th></th>
<th>With NBA</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>P-Value</td>
<td></td>
</tr>
<tr>
<td>Mother</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>12 (50.0)</td>
<td>12 (50.0)</td>
</tr>
<tr>
<td>No</td>
<td>8 (22.9)</td>
<td>27 (77.1)</td>
</tr>
<tr>
<td>Father</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>4 (33.3)</td>
<td>8 (66.7)</td>
</tr>
<tr>
<td>No</td>
<td>16 (34.8)</td>
<td>30 (65.2)</td>
</tr>
<tr>
<td>Sibling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>9 (31.0)</td>
<td>20 (69.0)</td>
</tr>
<tr>
<td>No</td>
<td>11 (37.9)</td>
<td>18 (62.1)</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2 (18.2)</td>
<td>9 (81.8)</td>
</tr>
<tr>
<td>No</td>
<td>2 (11.1)</td>
<td>16 (88.9)</td>
</tr>
</tbody>
</table>

Figure 3: types of medications used for allergy

Table 3: Methods of prevention adopted by participants with NBA

<table>
<thead>
<tr>
<th>Prevention</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ventilation &amp; House Clean</td>
<td>20</td>
<td>54.1</td>
</tr>
<tr>
<td>Avoid Pets (animals &amp; birds)</td>
<td>10</td>
<td>27.0</td>
</tr>
<tr>
<td>Avoid Carpets &amp; Curtains</td>
<td>8</td>
<td>21.6</td>
</tr>
<tr>
<td>Avoid Perfumes &amp; Air Fresheners</td>
<td>10</td>
<td>27.0</td>
</tr>
<tr>
<td>Avoid Cold Drinks &amp; Ice Cream</td>
<td>5</td>
<td>13.5</td>
</tr>
<tr>
<td>Avoid Dust &amp; Sand</td>
<td>23</td>
<td>62.2</td>
</tr>
<tr>
<td>Avoid Food of any type</td>
<td>3</td>
<td>8.1</td>
</tr>
</tbody>
</table>

DISCUSSION
The study was conducted among 200 university students showed that majority of the participants were under the age of 20 years and lived with their family and were single. Most candidates were from MBBS, Pharm D and DMD programs respectively.

The Association between socio-demographic variables and naso-bronchial allergy showed that NBA was higher among females and more common in South Asians and Arabs. A study by Alsowaidi S et al. on allergic Rhinitis in the Gulf Arab population reported a greater percentage of affected individuals below the age of 20. This well correlates with our study, but another fact to be mindful of is that this study had 66.3% of participants below the age of 20 where as 33.7% were 20 and above.
Out of 200 participants, 30% (60) had some form of allergy, of which 18.5% (37) had Naso-bronchial Allergies and the remaining 11.5% (23) had other forms of allergy of which skin allergy was the most frequent. In India, approximately 20% of the population suffers from allergic rhinitis and 15% from bronchial – asthma1. In another study in the US, the prevalence of allergic rhinitis and bronchial asthma was 30.2% and 22% respectively4. A study in Al Ain showed the prevalence of asthma and allergic rhinitis was 7.3%, while another study from Al Ain showed a 32% prevalence of Allergic Rhinitis5. This correlates with our results of having 30% out of the whole with some form of allergy.

The results show that the leading type of Allergens was dust accounting to effect around 70% (percent) of the participants. This was followed by exposure to tobacco smoke around 50-60%; and food and pollen with a rate of 31% and 30% respectively. Finally, followed by animal fur/hair & animals alone (ie cats, dogs and birds respectively) falling below 30%. Direct Tobacco and smoke are also considered here, which account for less than 25% in the graph. In a study in India, 45% of patients were diagnosed with naso-bronchial Allergy, and 79% allergic patients were positive for house dust allergen7.

Other studies of Patel A. et al and BH Giridhar et al. showed the most predominant allergens to be insects following pollen and dusts and fungi1,2. Also a local study by Tawam Hospital in Al Ain, UAE showed 61.6% positive patients with pollen. A reason why pollen was not amongst the most common allergen can be due to the fact that majority of the studies consider skin prick test, where our research was based on self-administered questionnaires. Animal fur/hair has also shown a positive response, this correlates with study by Tawam Hospital in Al Ain, which also had some percentage of rat, mouse, cat & goat hair10. Inclusion of food as an allergen in our research has also shown a positive response, this correlates with the BH Giridhar et al. study where in rice, mustard and milk were also listed amongst the common offending factors for naso-bronchial Allergy2. The results obtained from our questionnaire showed that majority of the participants that were positive for naso-bronchial allergy had common symptoms of runny nose and sneezing, followed by nose block, sore throat and throat irritation. Irrespective of the region where a study is conducted, the majority of the people suffer from similar symptoms which are caused by naso-bronchial allergies11.

Out of the 18.5% of the participants who had NBA, only 9 underwent a diagnostic test or procedure to diagnose their allergy. A study to find the common aero-allergens at Tawam Hospital in UAE showed that 263 UAE citizens who attended Tawam Hospital suspected as a provisional diagnosis to have allergies were submitted for skin prick test10. Most people do not generally undergo a procedure to diagnose their naso-bronchial allergies, even when they suffer from naso-bronchial allergic symptoms or respiratory diseases. The most common reason for this to occur can be due to lack of understanding and knowledge about naso-bronchial allergies and their symptoms amongst the general population in UAE.

Other studies showed that the most efficient, effective and quick method of diagnosing naso-bronchial allergies can be done by performing the skin prick test3,6,11,12,14,15. Majority of participants used anti-histamine drugs for naso-bronchial allergies. Other studies also show that majority of people mostly use nose sprays and H1-antihistamines to avoid naso-bronchial allergies such as allergic rhinitis7,16. Also nasal corticosteroids in the form of spray was also used according to previous studies which were also effective in preventing asthma exacerbations in patients with asthma and co-existing allergic rhinitis6,17.

Various methods that were used by the participants to prevent naso-bronchial allergies were avoiding dust and sand and to keep the house clean and ventilated, followed by other measures such as avoiding pets and avoiding perfumes & air
fresheners. Other studies also showed that people avoided dust mites, pets, animal dander and kept houses clean as methods in order to prevent their naso-bronchial allergies from becoming aggravated\textsuperscript{5,10,16,18}.

Majority of the participants that had naso-bronchial allergy had a positive family history of naso-bronchial allergy. Another study from India confirmed that a high percentage of people with nasobronchial allergy had family history of nasobronchial allergy as well\textsuperscript{3}.

In conclusion, 18.5\% of the participants had NBA, the common allergens were dust, tobacco smoke, food and pollen NBA was associated with a positive family history. The results of this study cannot be generalized due to the small sample size and the fact that it was done in one medical university. A larger study can be conducted to estimate the prevalence of naso bronchial allergies. And awareness should be spread to address the underlying allergen, so that it can aid people to plan better methods of prevention and help them to avoid exposure to factors that aggravate this condition.

**ACKNOWLEDGMENTS**

We would like to thank Ms. Aji Gopakumar and Prof. Jayadevan Sreedharan for helping us with data analysis.

**REFERENCES**


The knowledge, attitude and behavioral-intent regarding cervical cancer and the human papillomavirus (HPV) vaccine: A cross-sectional study among female university students in Ajman, UAE

Ifrah Mohamed Artan¹, Maria Bortnik¹, Zain Elahi¹*, Hiba Muneeb¹, Ali Bilal¹, Shatha Al Sharbatti², Joyce Jose³

¹College of Medicine/ MBBS Students, ²College of Graduate Study/ Department of Community Medicine, ³College of Medicine/ Department of Pathology, Gulf Medical University, Ajman, UAE

*Presenting Author

ABSTRACT

Objective: (1) Assess the knowledge towards the various aspects of the HPV, cervical cancer & the HPV vaccine. (2) Determine the percentage of participants who have received the vaccine. (3) Determine the attitude and behaviour-intent of participants regarding cervical cancer and the HPV vaccine.

Materials and Methods: A cross-sectional study was conducted amongst female university students in Ajman, UAE. Participants aged >18 years completed a self-administered validated, pilot-tested questionnaire. The knowledge was assessed in four domains: general knowledge, knowledge on prevalence and etiology, prevention, and risk factors. A scoring system was used and participants were identified to have low scores, if they scored < 50% of the corresponding total score. The SPSS version 21 was used to analyze the data, X² test and Fisher’s test were used to test the significance of association. A p value of <0.05 was accepted as significant.

Results: The study included 226 participants who were mostly ≥20 years of age (57%), Non-Arabs (67%), medical students (52%), first year university students (33%), single (96%), without health insurance (52%), and having stable financial status (58%). The proportion of participants who scored low for general knowledge, prevalence and etiology, prevention and risk factors were 63%, 59%, 79% and 98% respectively. Low knowledge score was significantly associated with age, for the general knowledge (P=0.04) and the knowledge on prevalence & etiology (P=0.001). Junior in comparison to senior student had significantly higher proportion of low scores for the general knowledge (P<0.001), knowledge on prevalence and etiology (P=0.001), and for Prevention (P=0.02). The non-medical students had significantly higher proportion of low scores for the general knowledge (P=0.04) and prevalence and etiology (P<0.01) compared to medical students. Receipt of HPV vaccine was only reported by 16 participants (7.3%) and the majority of the respondents (72%) reported their willingness to take the vaccine. Positive attitude was found in 67% of respondents.

Conclusion The prevalence of low knowledge is high. The main gap in knowledge was for the risk factors for cervical cancer. Majority of students have positive attitude towards the vaccine and its usage.

Keywords: Human Papilloma Virus, vaccine, cervical, cancer, knowledge, behavior, attitude
INTRODUCTION

Yearly, around 500,000 cases of invasive cervical carcinoma are diagnosed worldwide\(^1\). The causal role of human papillomavirus infection in women associated with the development of cervical carcinoma was identified 36 years ago\(^2\). Over 100 types of HPV are in existence and approximately 40 types can infect the genital tract. The two most carcinogenic genotypes of HPV are HPV16 and HPV18, which account for over 70% of cervical and vaginal cancers. Aside from cervical cancer, HPV contributes to other diseases such as genital warts, oropharyngeal, vaginal, vulvar and anal cancers\(^3\).

As of 2008, worldwide, cervical cancer is the third most common cancer in women and the fourth leading cause of cancer death (275,100) in females. It accounts for 9% (529,800) of total new cancer cases among females\(^4\). The incidence is highest in developing countries and this was attributed to lack of screening and lack of early detection of precancerous lesions and early stage cervical cancer\(^5\). Cervical cytology, or Pap smear, can greatly reduce the incidence and mortality of cervical cancer in women\(^2\).

There is very limited data on cervical cancer and HPV infection incidence in the UAE which has been linked by some researchers to strong cultural taboos\(^6\).

As of 2012, the Health Authority of Abu Dhabi (HAAD) reported 50–55 cases each year in the UAE with an incidence of 7 per 100,000 women, most of which were aged 35 to 55 years\(^7\). In February 2014, UAE Nationals reported 39 cases of cervical cancer and the average age of diagnosis was 47 years\(^8\).

The awareness and general knowledge with regard to HPV infection and its vaccine is low in most countries, including the Middle East\(^9\). A study done in Saudi Arabia found that out of 500 women, 339 (67.8%) were Saudi women and the rest being expatriates living in Saudi Arabia, only 14.4% were aware, that HPV can cause cervical cancer and only 9.8% knew of the HPV vaccine. Out of all the participants, 109 females stated to have a medical university degree. The awareness of the HPV vaccine didn’t seem to vary between older and younger age groups\(^10\).

In the UAE, Ortashi O. et al (2013) has surveyed 640 women, aged 18-50, of which only 29% have heard of HPV infection and only 22% have heard of the HPV vaccine. Few women seemed to recognize HPV as a sexually transmitted infection (15.3%), the authors speculated that this is mostly due to cultural taboos\(^11\).

Currently there are two approved prophylactic vaccines against HPV infection for young women, Gardasil® approved in 2006, and Cervarix® approved in 2009\(^12\). HPV vaccination has shown high efficacy in preventing high-grade cervical lesions (cervical intraepithelial neoplasia, adenocarcinoma in situ or cervical cancer). The observed efficacy of the quadrivalent HPV vaccine (Gardasil®), in a pooled analysis of three randomized, double-blind, placebo-controlled, multicenter trials in healthy girls and women aged 15-26 years, showed 98%\(^13\). With an expected eradication of the most prevalent types of HPV, due to vaccination (primary prevention), the need for intense screening (secondary prevention) will also decrease, lowering the financial burden of treating clinically relevant lesions\(^12\).

It is recommended that the HPV vaccine should be given to girls early, preferably to those who are between 11 and 17 years old, in order to prevent HPV infection before they become sexually active. In one study, the reasons given by 44% of parents for refusing to let their daughters given HPV vaccine, or delaying the vaccination, was that the vaccine has not been offered by their healthcare provider. The authors also found that some parents (21%) lacked knowledge about the vaccine and 13% believed that their daughters were too young for the vaccine. The previous study indicated that there are some misconceptions about the HPV vaccine, given to adolescents\(^14\). If young girls are not vaccinated at a younger age, they are at a risk of contracting the HPV infection later when they get married.
The HPV infection is mainly transmitted through sexual contact, but there is evidence of non-sexual transmission, since mothers can transmit HPV to their newborn perinatally and there is growing evidence of oral transmission as well. Several factors are associated with an increased risk of HPV infection as shown by Xavier Castellsagué et al. The researchers found that cervical cancer was more common in HPV-positive women with no education, poor hygiene, low socioeconomic status, multiple sexual partners, long-term use of hormonal contraception, herpes simplex virus-2 seropositivity. The study of Kahn JA et al showed that early age of first sexual intercourse increase the risk of HPV infection. Brassard P et al, found that the risk of HPV infection was significantly increased with current smoking and increased number of sexual partners, and not associated with the history of a previous sexually transmitted infection.

The present study was done to assess the awareness and knowledge of women in university about the prevention of HPV infection and cervical cancer through the HPV vaccine. We also want to determine their willingness to accept the HPV vaccine. This study may help to identify misconceptions related to this topic in the UAE. It is hoped that this research will provide basic information which can be used in future educational programs in medical schools which provide education and training for future healthcare providers, since it has been shown that the health care providers can play a key role in decision making related to the allowance of parents to their children to receive the HPV vaccine.

**MATERIALS AND METHODS**

**Study Design:** Cross Sectional study design.

**Target Population:** Female university students in Ajman, UAE

**Study population:** Female students of Gulf Medical University

**Inclusion criteria:**
- Female students aged ≥18 years
- Acceptance to give informed consent
- Female students from BPT, MBBS, DMD, BBMS, BHS programs in GMU who are available in the GMU Campus during the period of data collection

**Exclusion Criteria:**
- Male students
- Female students aged <18 years
- Female students in all GMU programs, who are not available on GMU campus during the duration of data collection

**Sample size:**
The following formula was used to calculate sample size for this cross-sectional study:

\[ N = \frac{Z^2 \cdot p \cdot q}{L^2} \]

\[ Z^2 = (1.96)^2 = 3.84 \text{ (fixed variable)} \]

\[ p = 0.18 \text{ (proportion of people who have the knowledge; estimated from a study done in Yemen, in which the proportion of those who knew about the vaccine was 0.18) } \]

\[ q = 0.82 (100-0.18) (1-p) \]
L² = 0.05^2 (Marginal Error)

Calculation:

3.84 x 0.18 x 0.82/(0.05)^2 = 226.71

**Study setting:** Gulf Medical University

**Duration of study:** 4 months, from September to December 2014.

**Study instrument & validation procedure:** Questionnaire, self administered questionnaire was used in this study, the questionnaire (draft) is shown in annex 1.

**Validation procedure:** Questionnaire was validated by a faculty of community medicine, a faculty from pathology and a faculty from microbiology department.

**Pilot test:** Included 5 students from the same target population.

**Ethical issues:** Ethical approval was obtained from the GMU Ethics Committee. Informed consent was taken from participants. Confidentiality of the information was ensured and the questionnaire was anonymous. Data were stored as per the GMU policy (see below).

**Methodology:** Final approval for data collection was taken from the various colleges in GMU (BPT, MBBS, DMD, BBMS, and BHS) and date of data collection was specified. Questionnaires were distributed to the participants after explaining the objectives and their rights. Informed consent was obtained from all participants. The knowledge was assessed in four domains: general knowledge, knowledge on prevalence and etiology, prevention, and risk factors. A scoring system was used and participants were identified to have low or adequate knowledge, if they scored < 50% or > 50% of the corresponding total score respectively.

**Data storage:** As per GMU policy data were stored in community medicine department.

**Data management and analysis:** Data were entered on a spread sheet and SPSS version 21. Data were presented in numbers, percentage, tables and figures. Chi-square was used to test association between variables.

**RESULTS**

The study included 226 participants. Their demographic characteristics are shown in table 1. Participants were mostly ≥20 years of age (57%), Non-Arabs (67%), medical students (52%), first year university students (33%), single (96%), without health insurance (52%), and having stable financial status (58%).

Figure 1 shows the proportion of participants who have low scores in different knowledge domains. The main gap in knowledge is found regarding cervical cancer risk factor.
Table 1: Socio-demographic distribution of participants

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Subclass</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>&lt;20</td>
<td>95</td>
<td>42.6</td>
</tr>
<tr>
<td></td>
<td>≥20</td>
<td>128</td>
<td>57.4</td>
</tr>
<tr>
<td>Nationality</td>
<td>African</td>
<td>37</td>
<td>16.9</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>29</td>
<td>13.2</td>
</tr>
<tr>
<td></td>
<td>East. Mediterranean</td>
<td>122</td>
<td>55.7</td>
</tr>
<tr>
<td></td>
<td>South East Asian</td>
<td>31</td>
<td>14.2</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>Arab</td>
<td>74</td>
<td>32.9</td>
</tr>
<tr>
<td></td>
<td>Non-Arab</td>
<td>151</td>
<td>67.1</td>
</tr>
<tr>
<td>Educational program</td>
<td>MBBS</td>
<td>116</td>
<td>52.0</td>
</tr>
<tr>
<td></td>
<td>Pharm D</td>
<td>30</td>
<td>13.5</td>
</tr>
<tr>
<td></td>
<td>DMD</td>
<td>44</td>
<td>19.7</td>
</tr>
<tr>
<td></td>
<td>BPT</td>
<td>33</td>
<td>14.8</td>
</tr>
<tr>
<td>Year of study</td>
<td>1</td>
<td>71</td>
<td>33.2</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>63</td>
<td>29.4</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>39</td>
<td>18.2</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>41</td>
<td>19.2</td>
</tr>
<tr>
<td>Marital Status</td>
<td>Married</td>
<td>8</td>
<td>3.6</td>
</tr>
<tr>
<td></td>
<td>Single</td>
<td>217</td>
<td>96.4</td>
</tr>
<tr>
<td>Health Insurance</td>
<td>Yes</td>
<td>106</td>
<td>47.5</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>117</td>
<td>52.5</td>
</tr>
<tr>
<td>Working outside the University</td>
<td>Yes</td>
<td>20</td>
<td>8.9</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>204</td>
<td>91.1</td>
</tr>
<tr>
<td>Financial Status</td>
<td>Excellent</td>
<td>84</td>
<td>37.8</td>
</tr>
<tr>
<td></td>
<td>Stable</td>
<td>128</td>
<td>57.7</td>
</tr>
<tr>
<td></td>
<td>Struggling/Falling behind</td>
<td>10</td>
<td>4.5</td>
</tr>
<tr>
<td>Religion</td>
<td>Muslim</td>
<td>196</td>
<td>87.1</td>
</tr>
<tr>
<td></td>
<td>Non-muslim</td>
<td>29</td>
<td>12.9</td>
</tr>
</tbody>
</table>

* missing data in some variables; 1 Americas, Europe, Western Pacific

The association between the demographic characteristics of participants and the Total knowledge is shown in table 2. It can be seen that only age has significant association with total knowledge scores. Higher percentage of adequate knowledge scores was noticed among younger age participants, students from the Eastern Mediterranean countries, Arabs, students in the MBBS program, and students in the third year.

Figure 1: The proportion of participants who have low scores in different knowledge domains (n=226)
Table 2: The association between total knowledge scores and the demographic characteristics of participants

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Subclass</th>
<th>Total Knowledge Scores</th>
<th>Total</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Low n (%)</td>
<td>Adequate n (%)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>&lt;20</td>
<td>89 (93.7)</td>
<td>6 (6.3)</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>≥20</td>
<td>127 (99.2)</td>
<td>1 (0.8)</td>
<td>128</td>
</tr>
<tr>
<td>Nationality</td>
<td>African</td>
<td>36 (97.3)</td>
<td>1 (2.7)</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>Other¹</td>
<td>29 (100)</td>
<td>0 (0)</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>East. Mediterranean</td>
<td>116 (95.1)</td>
<td>6 (4.9)</td>
<td>122</td>
</tr>
<tr>
<td></td>
<td>South East Asian</td>
<td>31 (100)</td>
<td>0 (0)</td>
<td>31</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>Arab</td>
<td>70 (94.6)</td>
<td>4 (5.4)</td>
<td>74</td>
</tr>
<tr>
<td></td>
<td>Non-Arab</td>
<td>148 (98)</td>
<td>3 (2)</td>
<td>151</td>
</tr>
<tr>
<td>Educational program</td>
<td>MBBS</td>
<td>111 (95.7)</td>
<td>5 (4.3)</td>
<td>116</td>
</tr>
<tr>
<td></td>
<td>PharmD</td>
<td>30 (100)</td>
<td>0 (0)</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>DMD</td>
<td>44 (100)</td>
<td>0 (0)</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>BPT</td>
<td>32 (97)</td>
<td>1 (3)</td>
<td>33</td>
</tr>
<tr>
<td>Year of study</td>
<td>1</td>
<td>69 (97.2)</td>
<td>2 (2.8)</td>
<td>71</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>62 (98.4)</td>
<td>1 (1.6)</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>36 (92.3)</td>
<td>3 (7.7)</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>40 (97.6)</td>
<td>1 (2.4)</td>
<td>41</td>
</tr>
<tr>
<td>Marital Status</td>
<td>Married</td>
<td>8 (100)</td>
<td>0 (0)</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Single</td>
<td>210 (96.8)</td>
<td>7 (3.2)</td>
<td>217</td>
</tr>
<tr>
<td>Health Insurance</td>
<td>Yes</td>
<td>103 (97.2)</td>
<td>3 (2.8)</td>
<td>106</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>113 (96.6)</td>
<td>4 (3.4)</td>
<td>117</td>
</tr>
<tr>
<td>Working outside University time</td>
<td>Yes</td>
<td>20 (100)</td>
<td>0 (0)</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>197 (96.6)</td>
<td>7 (3.4)</td>
<td>204</td>
</tr>
<tr>
<td>Financial Status</td>
<td>Excellent</td>
<td>83 (98.8)</td>
<td>1 (1.2)</td>
<td>84</td>
</tr>
<tr>
<td></td>
<td>Stable</td>
<td>122 (95.3)</td>
<td>6 (4.7)</td>
<td>128</td>
</tr>
<tr>
<td></td>
<td>Struggling/Falling behind</td>
<td>10 (100)</td>
<td>0 (0)</td>
<td>10</td>
</tr>
<tr>
<td>Religion</td>
<td>Muslim</td>
<td>189 (96.4)</td>
<td>7 (3.6)</td>
<td>196</td>
</tr>
<tr>
<td></td>
<td>Non-muslim</td>
<td>29 (100)</td>
<td>0 (0)</td>
<td>29</td>
</tr>
</tbody>
</table>

* Fisher’s test was used to determine the p-value; ** Fisher’s test and Chi-squared test not applicable in determining the p-value; ¹ Americas, Europe, Western Pacific

Table 3 shows the association between the demographic characteristics of participants and the general knowledge scores. Significant association was noticed between general knowledge scores and age, educational program and years of study. Higher percentage of adequate general knowledge scores was found among participants: younger age group, from Americas/Europe/ Western Pacific countries, Arabs, DMD program, 1st year students, married, health insured, not working, stable financially, and non-Muslim.

Figure 2 shows the proportion of participants who gave correct answers for General Knowledge questions. Only 45% of the participants knew that the HPV infection can be transmitted from mother to the baby.
Table 3: The association between general knowledge scores and the demographic characteristics of participants

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Subclass</th>
<th>General Knowledge</th>
<th>Total n</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Low n (%)</td>
<td>Adequate n (%)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>&lt;20</td>
<td>53 (55.8)</td>
<td>42 (44.2)</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>≥20</td>
<td>88 (68.8)</td>
<td>40 (31.3)</td>
<td>128</td>
</tr>
<tr>
<td>Nationality</td>
<td>African</td>
<td>26 (70.3)</td>
<td>11 (29.7)</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>Other ¹</td>
<td>16 (55.2)</td>
<td>13 (44.8)</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>East Mediterranean</td>
<td>77 (63.1)</td>
<td>45 (36.9)</td>
<td>122</td>
</tr>
<tr>
<td></td>
<td>South East Asian</td>
<td>21 (67.7)</td>
<td>10 (32.3)</td>
<td>31</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>Arab</td>
<td>43 (58.1)</td>
<td>31 (41.9)</td>
<td>74</td>
</tr>
<tr>
<td></td>
<td>Non-Arab</td>
<td>100 (66.2)</td>
<td>51 (33.8)</td>
<td>151</td>
</tr>
<tr>
<td>Educational</td>
<td>MBBS</td>
<td>81 (69.8)</td>
<td>35 (30.2)</td>
<td>116</td>
</tr>
<tr>
<td>program</td>
<td>PharmD</td>
<td>20 (66.7)</td>
<td>10 (33.3)</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>DMD</td>
<td>20 (45.5)</td>
<td>24 (54.5)</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>BPT</td>
<td>20 (60.6)</td>
<td>13 (39.4)</td>
<td>33</td>
</tr>
<tr>
<td>Year of study</td>
<td>1</td>
<td>32 (45.1)</td>
<td>39 (54.9)</td>
<td>71</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>36 (57.1)</td>
<td>27 (42.9)</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>34 (87.2)</td>
<td>5 (12.8)</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>32 (78)</td>
<td>9 (22)</td>
<td>41</td>
</tr>
<tr>
<td>Marital Status</td>
<td>Married</td>
<td>6 (75)</td>
<td>2 (25)</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Single</td>
<td>136 (62.7)</td>
<td>81 (37.3)</td>
<td>217</td>
</tr>
<tr>
<td>Health Insurance</td>
<td>Yes</td>
<td>62 (58.5)</td>
<td>44 (41.5)</td>
<td>106</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>79 (67.5)</td>
<td>38 (32.5)</td>
<td>117</td>
</tr>
<tr>
<td>Working outside the University time</td>
<td>Yes</td>
<td>15 (75)</td>
<td>5 (25)</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>128 (62.7)</td>
<td>76 (37.3)</td>
<td>204</td>
</tr>
<tr>
<td>Financial Status</td>
<td>Excellent</td>
<td>60 (71.4)</td>
<td>24 (28.6)</td>
<td>84</td>
</tr>
<tr>
<td></td>
<td>Stable</td>
<td>75 (58.6)</td>
<td>53 (41.4)</td>
<td>128</td>
</tr>
<tr>
<td></td>
<td>Struggling/Falling behind</td>
<td>7 (70)</td>
<td>3 (30)</td>
<td>10</td>
</tr>
<tr>
<td>Religion</td>
<td>Muslim</td>
<td>125 (63.8)</td>
<td>71 (36.2)</td>
<td>196</td>
</tr>
<tr>
<td></td>
<td>Non-muslim</td>
<td>17 (58.6)</td>
<td>12 (41.4)</td>
<td>29</td>
</tr>
</tbody>
</table>

* Fisher’s test was used to determine the p-value; ** Chi-squared test not applicable, Fischer’s test not applicable. See description under graph for financial status; ¹ Americas, Europe, Western Pacific

Figure 2. The proportion of participants who have correct answers of General Knowledge questions. (n=226)
Table 4: The association between cervical cancer prevalence and etiology knowledge scores and the demographic characteristics of participants

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Subclass</th>
<th>Prevalence &amp; Etiology, knowledge scores</th>
<th>Total n</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Low n (%)</td>
<td>Adequate n (%)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>&lt;20</td>
<td>68 (71.6)</td>
<td>27 (28.4)</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>≥20</td>
<td>64 (50)</td>
<td>64 (50)</td>
<td>128</td>
</tr>
<tr>
<td>Nationality</td>
<td>African</td>
<td>22 (59.5)</td>
<td>15 (40.5)</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>Other¹</td>
<td>13 (44.8)</td>
<td>16 (55.2)</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>East. Mediterranean</td>
<td>74 (60.7)</td>
<td>48 (39.3)</td>
<td>122</td>
</tr>
<tr>
<td></td>
<td>South East Asian</td>
<td>19 (61.3)</td>
<td>12 (38.7)</td>
<td>31</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>Arab</td>
<td>46 (62.2)</td>
<td>13 (17.6)</td>
<td>74</td>
</tr>
<tr>
<td></td>
<td>Non-Arab</td>
<td>86 (57)</td>
<td>65 (43)</td>
<td>151</td>
</tr>
<tr>
<td>Educational program</td>
<td>MBBS</td>
<td>50 (43.1)</td>
<td>66 (56.9)</td>
<td>116</td>
</tr>
<tr>
<td></td>
<td>Pharm D</td>
<td>20 (66.7)</td>
<td>10 (33.3)</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>DMD</td>
<td>34 (77.3)</td>
<td>10 (22.7)</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>BPT</td>
<td>27 (81.8)</td>
<td>6 (18.2)</td>
<td>33</td>
</tr>
<tr>
<td>Year of study</td>
<td>1</td>
<td>52 (73.2)</td>
<td>19 (26.8)</td>
<td>71</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>41 (65.1)</td>
<td>22 (34.9)</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>17 (43.6)</td>
<td>22 (56.4)</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>17 (41.5)</td>
<td>24 (58.5)</td>
<td>41</td>
</tr>
<tr>
<td>Marital Status</td>
<td>Married</td>
<td>2 (25)</td>
<td>6 (75)</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Single</td>
<td>130 (59.5)</td>
<td>87 (40.1)</td>
<td>217</td>
</tr>
<tr>
<td>Health Insurance</td>
<td>Yes</td>
<td>59 (55.7)</td>
<td>47 (44.3)</td>
<td>106</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>72 (61.5)</td>
<td>45 (38.5)</td>
<td>117</td>
</tr>
<tr>
<td>Working outside University time</td>
<td>Yes</td>
<td>12 (60)</td>
<td>8 (40)</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>119 (58.3)</td>
<td>85 (41.7)</td>
<td>204</td>
</tr>
<tr>
<td>Financial Status</td>
<td>Excellent</td>
<td>45 (53.6)</td>
<td>39 (46.4)</td>
<td>84</td>
</tr>
<tr>
<td></td>
<td>Stable</td>
<td>79 (61.7)</td>
<td>49 (38.3)</td>
<td>128</td>
</tr>
<tr>
<td></td>
<td>Struggling/Falling behind</td>
<td>6 (60)</td>
<td>4 (40)</td>
<td>10</td>
</tr>
<tr>
<td>Religion</td>
<td>Muslim</td>
<td>119 (60.7)</td>
<td>77 (39.3)</td>
<td>196</td>
</tr>
<tr>
<td></td>
<td>Non-muslim</td>
<td>13 (69)</td>
<td>16 (55.2)</td>
<td>29</td>
</tr>
</tbody>
</table>

Table 4 shows the association between the demographic characteristics of participants and the prevalence and etiology knowledge scores. Significant associations are found between the knowledge scores and age, education program and years of study. Higher percentage of adequate knowledge scores have been found in participants of younger age group, from Eastern Mediterranean countries, Non-Arabs, MBBS students, 4th year, married, health insured, working, excellent financially and non-Muslims.

Figure 3 shows the proportion of participants who have correct answers of the prevalence & etiology questions.
Vaccine can also be oores.

In the UAE, cervical cancer is the 3rd most common cancer among women 15-44 Y age.

HPV can cause cervical cancer.

HPV is transmiable through sexual contact.

**Figure 3:** The proportion of participants who have correct answers of the prevalence & etiology of cervical cancer questions. \(n=226\)

* Fisher’s test was used to determine p-value; **Fisher’s test and chi-squared test not applicable; \(^1\) Americas, Europe, Western Pacific.

Table 5 shows the association between prevention knowledge scores and the demographic characteristics of participants. We observe significant association between prevention knowledge scores and nationality, ethnicity and year of study. Higher percentage of above average knowledge scores was seen among participants in the older age group, from Southeast Asian countries, Non-Arabs, pharmD students, 3rd year, single, health insured, not working, excellent financially, and non-Muslims.

Figure 4 shows the proportion of participants who gave correct answers of the Prevention Knowledge questions. Only 28.8% know that the HPV vaccine can also be given to males.

Table 5: The association between prevention knowledge scores and the demographic characteristics of participants

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Subclass</th>
<th>Prevention Knowledge</th>
<th>Total n</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Low (n (%))</td>
<td>Moderate (n (%))</td>
<td>High (n (%))</td>
</tr>
<tr>
<td>Age</td>
<td>&lt;20</td>
<td>77 (81.8)</td>
<td>18 (18.9)</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>≥20</td>
<td>98 (76.7)</td>
<td>30 (23.4)</td>
<td>128</td>
</tr>
<tr>
<td>Nationality</td>
<td>African</td>
<td>28 (75.7)</td>
<td>9 (24.3)</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>Other(^1)</td>
<td>21 (72.4)</td>
<td>8 (27.6)</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>East. Mediterranean</td>
<td>103 (84.4)</td>
<td>19 (15.6)</td>
<td>122</td>
</tr>
<tr>
<td></td>
<td>South East Asian</td>
<td>19 (61.3)</td>
<td>12 (38.7)</td>
<td>31</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>Arab</td>
<td>64 (86.5)</td>
<td>10 (13.5)</td>
<td>74</td>
</tr>
<tr>
<td></td>
<td>Non-Arab</td>
<td>113 (74.8)</td>
<td>38 (25.2)</td>
<td>151</td>
</tr>
<tr>
<td>Educational</td>
<td>MBBS</td>
<td>91 (78.4)</td>
<td>25 (21.6)</td>
<td>116</td>
</tr>
<tr>
<td>program</td>
<td>Pharm D</td>
<td>22 (73.3)</td>
<td>8 (26.7)</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>DMD</td>
<td>34 (77.3)</td>
<td>10 (22.7)</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>BPT</td>
<td>28 (84.8)</td>
<td>5 (15.2)</td>
<td>33</td>
</tr>
<tr>
<td>Year of study</td>
<td>1</td>
<td>59 (83.1)</td>
<td>12 (16.9)</td>
<td>71</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>52 (82.5)</td>
<td>11 (17.5)</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>23 (59)</td>
<td>16 (41)</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>32 (78)</td>
<td>9 (22)</td>
<td>41</td>
</tr>
<tr>
<td>Marital Status</td>
<td>Married</td>
<td>7 (87.5)</td>
<td>1 (12.5)</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Single</td>
<td>171 (78.8)</td>
<td>46 (21.2)</td>
<td>217</td>
</tr>
<tr>
<td>Health Insurance</td>
<td>Yes</td>
<td>80 (75.5)</td>
<td>26 (24.5)</td>
<td>106</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>96 (82.1)</td>
<td>21 (17.9)</td>
<td>117</td>
</tr>
<tr>
<td>Working outside</td>
<td>Yes</td>
<td>16 (80)</td>
<td>4 (20)</td>
<td>20</td>
</tr>
<tr>
<td>University time</td>
<td>No</td>
<td>160 (78.4)</td>
<td>44 (21.6)</td>
<td>204</td>
</tr>
</tbody>
</table>
between breast cancer risk factor knowledge scores and the demographic characteristics of participants.

Table 6 shows the association between the demographic characteristics of participants and cervical cancer risk factor knowledge scores. No significance was observed between risk factor knowledge scores and the demographic characteristics of participants. Higher percentage of above average knowledge scores were noticed among participants who are <20 years of age, from South East Asian countries, Arabs, DMD students, 2nd year student, married, non-health insured, not working, excellent financially and Muslims.

Figure 5 shows the proportion of participants who gave correct answers to the cervical cancer risk knowledge questions. Most of the participants knew that multiple sex partners increase the risk of cervical cancer.

Table 6: The association between breast cancer risk factor knowledge scores and the demographic characteristics of participants

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Subclass</th>
<th>Risk Factors</th>
<th>Total n</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Below average n (%)</td>
<td>Average and above n (%)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>&lt;20</td>
<td>92 (96.8)</td>
<td>3 (3.2)</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>≥20</td>
<td>127 (99.2)</td>
<td>1 (0.8)</td>
<td>128</td>
</tr>
</tbody>
</table>

* Fisher’s test was used to determine p value; ** Chi-squared test & Fisher’s test was not applicable for the p-value; Americas, Europe, Western Pacific.
The majority of participants reported their willingness to encourage their friends to get vaccinated. The proportion of participants who gave correct answers to the questions on Risk Factor Knowledge is shown in Figure 5. Fisher's test was used to determine the p-value; **Chi-square & Fisher's test is not applicable; * Americas, Europe, Western Pacific

With regard to Behaviour and Attitude, only 16 participants (6.3%) had received HPV vaccine and 72% (n=152) of unvaccinated participants want to take the HPV vaccine. The majority of participants reported their willingness to encourage their friends to get vaccinated.

Figure 5. The proportion of participants who gave correct answers to the of Risk Factor Knowledge questions. (n=226)
young female relatives to get vaccinated against HPV infection (79.1%) and to encourage other women to get screened by PAP smear (88.1%). Positive attitude was found in 67% of respondents.

**DISCUSSION**

In this study low knowledge scores were seen. Similar finding was found in a study from Turkey that included women from different socioeconomic status and showed that 55% of the participants had no knowledge about HPV\(^ {21}\).

Achievement of the adequate knowledge among the target population is very essential since they are the future health care providers and parents of girls who need to receive the HPV vaccine. Evidence showed that acceptability of the parents towards the HPV vaccination of adolescent girls is increased significantly when they are educated about the vaccine\(^ {22}\) and when the vaccine is recommended by healthcare providers\(^ {19}\).

In this study, the knowledge score was significantly associated with age, for the general knowledge (P=0.047) and the knowledge on prevalence and etiology (P=0.001). This is in agreement with Di Giuseppe et al study\(^ {23}\) which showed that age was a significant predictor of the knowledge related to the HPV vaccine.

The study results indicated that junior in comparison to senior student had significantly higher proportion of low knowledge scores for cervical cancer prevalence and etiology (P=0.001), and for Prevention (P=0.02), which suggest possible acquisition of information through educational courses received by senior students. The absence of consistency of the previously mentioned observation for all studied knowledge domains suggested that there is a need to plan for comprehensive education session that includes all relevant information.

In this study no significant association was noticed between knowledge and ethnicity except for the knowledge on prevention of cervical cancer. Data showed that participants from minority ethnicity have lower knowledge regarding HPV and cervical cancer\(^ {24}\). With the analyses used in this study, it is difficult to control for the confounding effect of other factors that can make knowledge of one ethnic group significantly higher than the other.

In the current study, no significant association was noticed between marital status and knowledge scores. This is inconsistent with a prior study which showed that married women are more likely to have good knowledge\(^ {25}\).

Socioeconomic status, health insurance and knowledge, are associated with the uptake of HPV vaccine\(^ {26}\) and cervical cancer screening practice\(^ {27}\). The present results showed no significant association between knowledge and health insurance, and socioeconomic status.

Remarkably, low awareness about the HPV infection among adolescents and young women was reported in a study from Italy\(^ {23}\), in which only 23.3% of participants had heard of HPV. More awareness (58%) was reported in a study including university students in the UK\(^ {28}\). In this study, better awareness than aforementioned studies was noticed and 68.8% of participants had heard about HPV infection.

In this study, 63.4% of the respondents recognized that HPV infection is transmitted through sexual contact. This is higher than that reported earlier in a study done in the UAE, Al-Ain\(^ {29}\) with only (15.3%) having that knowledge. This is possibly due to the absence of sexual education of the public.

The knowledge that the body can clear the HPV virus was only documented in 10.7% of respondents this is higher than 6% reported by Drewry J et al\(^ {30}\).

An important aspect of this study is the knowledge related to the risk factors and prevention of cervical cancer. Although 71% of respondent knew that the disease can be prevented, only 64% and 60.4% had heard about PAP smear and HPV vaccine
respectively. Slightly lower values were reported by Di Giuseppe et al study\textsuperscript{23}, with a 60.2 \% for PAP smear and 42.1\% for the HPV vaccine. Much lower proportions were presented by Assoumou et al\textsuperscript{25} with a 27.9\% for the former and only 8\% for the later.

Only 16 participants (6.3\%) had received HPV vaccine, and 72\%, of those who were not vaccinated reported their willingness to receive the vaccine. A study including university student in Turkey showed that almost all students had not received HPV vaccine (99.7\%) and only 32.6\% wanted to get an HPV vaccination.\textsuperscript{31} High willingness to receive HPV vaccine observed in this study is inline with results reported by Dursun P et al\textsuperscript{21} (70\%) and Di Giuseppe G et al (81.7 \%)\textsuperscript{23}.

CONCLUSION

The prevalence of Low knowledge is high. The main gap in knowledge was for the risk factors for cervical cancer. Majority of students have positive attitude towards the vaccine and its usage.

ACKNOWLEDGEMENT

We would like to thank Professor Shatha Al-Sharbatti and Dr. Joyce Jose, Gulf Medical University, Department of Community Medicine and Pathology for their guidance and support for the completion of this study. We would also like to thank Dr. Jing Ma and Mrs. Aje; Gulf Medical University, Department of community medicine and CABRI and the students for their guidance and support for the development of this study.

REFERENCES

13. McCormack PL, Joura EA. Spotlight on quadrivalent human papillomavirus (types 6, 11, 16, 18) recombinant vaccine(Gardasil®) in the prevention of premalignant genital lesions, genital cancer, and


Presence of Test Anxiety and Association with Forms of Assessment among Health Sciences students in Ajman, UAE

Mariam Syed\textsuperscript{1}, Areeba Memon\textsuperscript{1}, Amna Ashraf\textsuperscript{1}, Amnah Sheikh\textsuperscript{1}, Alya Al Suwaidi\textsuperscript{1}, Dr Rizwana B Sheikh\textsuperscript{2}

\textsuperscript{1}MBBS Year 3, \textsuperscript{2}Department of Community Medicine, Gulf Medical University, Ajman, UAE

*Presenting Author

ABSTRACT

\textbf{Introduction:} Test anxiety is a psychological condition that results in extreme fear of poor performance on examinations and is commonly found among medical students. A study was conducted on the proportion of test anxiety among medical university students and the factors affecting it, determining the types of test anxiety and associating it with grades and forms of assessment.

\textbf{Materials and Methods:} A cross-sectional study was done on the students of Gulf Medical University, Ajman by using self-administered questionnaires, which included the Westside Test Anxiety Scale, socio demographic variables and symptoms of anxiety with the type of assessment. Data was analyzed using the SPSS program. A Chi square test was done for association.

\textbf{Results:} 43\% of those surveyed had high anxiety levels. Test Anxiety was found to be high among medical university students especially in the age group of below 20 years, females, and the early years of medical training. The symptoms experienced were also surveyed with the largest number of students having trouble sleeping (n=75). The results showed that viva and seminar invoked the most severe responses in students, while OSPE, OSCE, MCQs and SAQs resulted in fewer symptoms. Students with high levels of test anxiety scored less than their low anxiety peers. However the study in general was inconclusive about the facilitative or debilitative effect of test anxiety on students, though certain parts of the study indicated a rather debilitative effect on academic performance.

\textbf{Conclusions:} Overall, test anxiety was found to be high among medical university students. Various coping strategies are recommended, including counseling by experienced healthcare professionals, and proper time management. A modification of forms of assessment which cause severe and debilitating forms of test anxiety was also suggested.

\textbf{Key words:} Test anxiety; students, medical
INTRODUCTION

Test anxiety is a psychological condition that results in extreme fear of poor performance on examinations and is commonly found among medical students. This type of anxiety usually arises during assessments such as oral examinations, written examinations, standardized tests, etc. It can be defined as feelings of fear accompanied with cognitive deficits.

Too often, Test Anxiety is not considered as an educational issue despite its consequences. A survey was conducted among other medical students, in an attempt to determine the presence of test anxiety, which is bound to be seen in medical students. As there is no published research on Test Anxiety in this region, it was thought that the results of the study would shed light on an otherwise marginalized aspect of student welfare. The study conducted also analyzes the factors associated with test anxiety, which would help determine the vulnerable groups of students. The study we have carried out would also help suggest methods of coping with the problem of Test Anxiety.

Research suggests that around 25-40% of students suffer from test anxiety. Intensity of test anxiety varies from one person to another making it imperative to determine its intensity. Regarding anxiety symptoms, the literature shows that young people who study biomedical sciences are more prone to anxiety related symptoms than those who study humanities. The same fact was mentioned in a U.S.-based systematic review by Dyrbye et al. in which the prevalence of anxiety symptoms among medical students appeared to be higher than in students taking other courses. These figures were similar among cross-sectional and longitudinal studies using different instruments. Sahoo and Khess showed a 24.4% prevalence of anxiety among students aged 17 to 22 years who attended various colleges.

The primary role of educational institutes is to assess their students on the knowledge imparted. The main goal behind assessing the students is to establish whether they have perceived the knowledge correctly or have failed to do so, in which case, they will be faced with certain consequences such as repeating the course or the exam. As certain standardized criteria arise for the methods of assessment and the intensity of each form, almost all students feel apprehensive before taking an exam or during it. It is considered rather normal to experience a mild form of anxiety before an exam; however, some students experience an extreme form of test anxiety which interferes with their performance and seriously affects their grades. It is important to note that these students obtain the skills and knowledge to perform well, yet fail to do so due to the severity of the anxiety.

Due to the importance of performing well on tests in educational institutes, a lot of pressure is placed upon students. The primary objective of this research is to assess the occurrence and severity of test anxiety among university students in Ajman. The choice of subjects was not a coincidence; this research specifically targets college students because regardless of how common other mental health problems are, anxiety disorders are most common in college students. Research suggests that around 25 to 40% percent of students suffer from test anxiety. Due to the high prevalence of test anxiety among college students, more students should be aware of the condition and should be familiar with the symptoms, the factors related how to cope with it, and how to treat it.

While most studies imply an unfavorable education outcome due to test anxiety, a few studies propose that it is more an association rather than a fixed correlation between anxiety and accomplishment.

As cited by Kahan, one study brought up a difference between the traits of promoting and impeding test anxiety. Consequently, the anxiety can either stimulate
academic performance (facilitating) or inhibit performance (debilitating). In consonance with the two-dimensional outlook suggested by Kahan\textsuperscript{13}, facilitating and debilitating test anxiety are perceived as being considerably independent pillars of a sequence, and they are both evaluated separately\textsuperscript{12}. Research explains that these two sides of anxiety are inversely proportional and nearly equal with regard to performance\textsuperscript{8}.

In agreement with this two-dimensional outlook, a student can have one type of anxiety and not the other or have a large amount of both types or have virtually none of the types. Studies show that pupils with elevated levels of debilitating test anxiety do not do well in their exams, while pupils with elevated levels of facilitating test anxiety do comparatively well\textsuperscript{13,16,17}. Additionally, the research by Munz et al\textsuperscript{16} proposes the idea that college undergraduates be classified as “facilitators” (i.e. those who acquired higher exam scores), “debilitators” (i.e. those who acquired lower exam scores), and “non-effected”\textsuperscript{4}.

**MATERIALS AND METHODS**

A cross-sectional study was conducted among the health sciences students of Gulf Medical University, Ajman. The tool for data collection was a self-administered questionnaire which consists of three parts. The first part consisted of demographic related questions such as: age, gender, ethnicity, living accommodations, socio-economic status, education level and occupation of parents. The second part focused on the forms of assessment and the anxiety level present with each and the symptoms experienced. The third part was the “Westside Test Anxiety Scale” which consists of ten statements scaled from one to five depending on how the participant agrees or disagrees with each item. A pilot study was done on five students to assess the clarity of the questionnaire’s directions. Validity of this study was confirmed by a medical expert from the Community Medicine Department of Gulf Medical University. Approval was obtained by the Research and Ethics Committees of Gulf Medical University. Anonymity and confidentiality was maintained by not including the names or any identity of the participants and keeping the data only with the researchers, the supervisors and the statisticians. Data collection was initiated only after obtaining the Ethics Committee approval. Data was entered on MS Excel. Data was analyzed using the SPSS program. The results are presented in tables and graphs and Chi square test was done for associations.
RESULTS

Figure 1: Proportion of health sciences students with test anxiety (N=195)

The above pie chart shows the proportion and extent of test anxiety among participants. 42% of participants had moderate/extremely high anxiety levels indicating a high proportion of students are anxious. 19% of participants experienced low anxiety levels.

Figure 2: Participants grades and the level of anxiety (<80%N=71; >80% N=120) * Non response=4
Figure 2 shows the participant’s level of anxiety with their respective grades. 25% had low test anxiety among those who scored >80% when compared to 9.8% who had low test anxiety among those who scored <80%

![Figure 2: Participant's Anxiety Level with Grades](image)

This chart sums up the pattern and frequency of symptoms prevalent among participants in accordance with test anxiety. It shows the extent of test anxiety experienced by participants in order of highest to lowest in frequency. A vast majority of the participants had trouble sleeping (75). Similarly a higher proportion of participants also experienced having cold hands (59) and blanking (50). A moderate number of people experienced other symptoms like sweating (41), palpitations (37) and shaking (36). A lower fraction of participants had nausea (24), difficulty in breathing (14) and other symptoms (eg. Diarrhea; psychological disturbances, etc).

![Figure 3: Symptoms of Test Anxiety among Participants](image)

Figure 3: Symptoms of Test Anxiety among the participants (N=195)

![Figure 4: Forms Assessment Related to Severity of Symptoms](image)

Figure 4: Forms Assessment Related to Severity of Symptoms (N=195)
Figure 3 shows the different forms of assessment in relation to the severity of symptoms. For MCQs, 40.7% of the participants declared to have no symptoms. For SAQs, OSPE, and OSCE most of the participants had mild symptoms. For viva 44.5% and seminar 25.9% of the participants reported to have moderate to severe symptoms.

Table 1: Association between participant’s Socio-demographic characteristics and Anxiety Level

<table>
<thead>
<tr>
<th>Socio-demographic Characteristics</th>
<th>Groups</th>
<th>Anxiety Level</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Low (1.0-1.9)</td>
<td>Normal (2.0-2.9)</td>
</tr>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Age in years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;20 years</td>
<td>23</td>
<td>19.0</td>
<td>44</td>
</tr>
<tr>
<td>≥20 years</td>
<td>14</td>
<td>20.0</td>
<td>29</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>14</td>
<td>24.1</td>
<td>25</td>
</tr>
<tr>
<td>Female</td>
<td>23</td>
<td>17.3</td>
<td>48</td>
</tr>
<tr>
<td>Living Accommodation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With Family/guardian</td>
<td>25</td>
<td>22.7</td>
<td>40</td>
</tr>
<tr>
<td>Hostel</td>
<td>8</td>
<td>15.7</td>
<td>17</td>
</tr>
<tr>
<td>Separate</td>
<td>4</td>
<td>13.8</td>
<td>16</td>
</tr>
<tr>
<td>Nationality</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local</td>
<td>0</td>
<td>0.0</td>
<td>2</td>
</tr>
<tr>
<td>Non-Local</td>
<td>37</td>
<td>20.4</td>
<td>70</td>
</tr>
<tr>
<td>Course</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MBBS</td>
<td>26</td>
<td>22.4</td>
<td>41</td>
</tr>
<tr>
<td>DMD</td>
<td>3</td>
<td>8.6</td>
<td>17</td>
</tr>
<tr>
<td>Pharm D</td>
<td>3</td>
<td>21.4</td>
<td>7</td>
</tr>
<tr>
<td>BPT</td>
<td>5</td>
<td>26.3</td>
<td>7</td>
</tr>
<tr>
<td>BHS</td>
<td>0</td>
<td>0.0</td>
<td>1</td>
</tr>
<tr>
<td>Year of Study</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤2nd Year</td>
<td>27</td>
<td>19.9</td>
<td>46</td>
</tr>
<tr>
<td>3rd – 5th Year</td>
<td>10</td>
<td>18.2</td>
<td>27</td>
</tr>
<tr>
<td>Mother’s Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High School</td>
<td>6</td>
<td>15.0</td>
<td>17</td>
</tr>
<tr>
<td>Undergraduate</td>
<td>4</td>
<td>14.8</td>
<td>12</td>
</tr>
<tr>
<td>Graduate</td>
<td>13</td>
<td>16.3</td>
<td>32</td>
</tr>
<tr>
<td>PG</td>
<td>13</td>
<td>30.2</td>
<td>12</td>
</tr>
<tr>
<td>Undergraduate &amp; Less</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graduate</td>
<td>7</td>
<td>14.9</td>
<td>21</td>
</tr>
<tr>
<td>Father’s Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graduated</td>
<td>12</td>
<td>17.1</td>
<td>25</td>
</tr>
<tr>
<td>Grade</td>
<td>17</td>
<td>23.3</td>
<td>27</td>
</tr>
<tr>
<td>&lt;70</td>
<td>2</td>
<td>7.7</td>
<td>12</td>
</tr>
<tr>
<td>70-79</td>
<td>5</td>
<td>11.1</td>
<td>22</td>
</tr>
<tr>
<td>80-89</td>
<td>21</td>
<td>26.3</td>
<td>28</td>
</tr>
<tr>
<td>&gt;90</td>
<td>9</td>
<td>22.5</td>
<td>11</td>
</tr>
</tbody>
</table>

Various factors were found to be influencing Test Anxiety levels and Table 1 shows the association of socio-demographic factors and anxiety levels, our main concern being the participants with high levels of Anxiety.

44% of participants below the age of 20 were found to have high levels of anxiety, compared to 38.6% in those above 20 years of age. High Anxiety levels were found to be higher in females. Those living in the hostel accommodation showed a higher level of anxiety followed by those living with family and those living separately.
The highest level of test anxiety (85.7%) was found in those in the BHS course followed by about 40% in MBBS and DMD students, BPT students with 36.8% and the least in Pharm D students (28.6%).

High levels of test anxiety was also found in those in the early years of the MBBS course (year 1 and 2) compared to students of 3rd, 4th, and 5th year.

Of the participants who had scored above 90% in their previous exam, 50% showed high level of test anxiety, 27.5% with normal levels of test anxiety and 22.5% with low levels of test anxiety indicating facilitative effects of test anxiety.

Parent’s educational level showed no significance in the determination of different levels of test anxiety among participants.

Table 2: Association of Westside Anxiety Scores with Severity of Symptoms (N=195)

<table>
<thead>
<tr>
<th>Forms of Severity Assessment</th>
<th>Westside Score</th>
<th>Total</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low (1.0-1.9)</td>
<td>Normal (2.0-2.9)</td>
<td>High (3.0-5.0)</td>
</tr>
<tr>
<td>MCQs</td>
<td>Moderate to Severe symptoms</td>
<td>3 (8.3)</td>
<td>7 (19.4)</td>
</tr>
<tr>
<td>SAQs</td>
<td>Moderate to Severe Symptoms</td>
<td>4 (7.5)</td>
<td>14 (26.4)</td>
</tr>
<tr>
<td>OSPE</td>
<td>Moderate to Severe symptoms</td>
<td>4 (11.1)</td>
<td>7 (19.4)</td>
</tr>
<tr>
<td>OSCE</td>
<td>Moderate to Severe symptoms</td>
<td>0 (0)</td>
<td>7 (25)</td>
</tr>
<tr>
<td>VIVA</td>
<td>Severe to Moderate Symptoms</td>
<td>5 (9.6)</td>
<td>16 (30.8)</td>
</tr>
<tr>
<td>Seminar</td>
<td>Severe to Moderate Symptoms</td>
<td>3 (4.3)</td>
<td>23 (33.3)</td>
</tr>
</tbody>
</table>

Table 2 shows the cross tabulation of Westside anxiety scores with symptoms experienced in different methods of assessment. The maximum amount of moderate to severe symptoms was experienced by the students during seminar followed by viva.

Table 3: Westside Table Frequencies

<table>
<thead>
<tr>
<th>Question</th>
<th>Not at all</th>
<th>Slightly seldom true</th>
<th>Moderately sometimes true</th>
<th>Highly usually true</th>
<th>Always true</th>
</tr>
</thead>
<tbody>
<tr>
<td>The closer I am to a major exam, the harder it is for me to concentrate on the material.</td>
<td>45 (23.1%)</td>
<td>44 (22.6%)</td>
<td>69 (35.4%)</td>
<td>16 (8.2%)</td>
<td></td>
</tr>
<tr>
<td>When I study for my exams, I worry that I will not remember the material on the exam</td>
<td>21 (10.8%)</td>
<td>38 (19.5%)</td>
<td>52 (26.7%)</td>
<td>29 (14.9%)</td>
<td></td>
</tr>
<tr>
<td>During important exams, I think that I am doing awful or that I may fail.</td>
<td>30 (15.4%)</td>
<td>45 (23.1%)</td>
<td>69 (35.4%)</td>
<td>17 (8.7%)</td>
<td></td>
</tr>
<tr>
<td>I lose focus on important exams, and I cannot remember material that I knew before the exam</td>
<td>48 (24.6%)</td>
<td>56 (28.7%)</td>
<td>51 (26.2%)</td>
<td>15 (7.7%)</td>
<td></td>
</tr>
<tr>
<td>I finally remember the answer to exam questions after the exam is already over</td>
<td>33 (16.9%)</td>
<td>56 (28.7%)</td>
<td>51 (26.2%)</td>
<td>19 (9.7%)</td>
<td></td>
</tr>
<tr>
<td>Worry so much before a major exam that I am too worn out to do</td>
<td>41 (21.0%)</td>
<td>61 (31.3%)</td>
<td>47 (24.1%)</td>
<td>13 (6.7%)</td>
<td></td>
</tr>
</tbody>
</table>
my best on the exam. I feel out of sorts or not really myself when I take important exams. I find that my mind sometimes wanders when I am taking important exams. After an exam, I worry about whether I did well enough. I struggle with written assignments, or avoid doing them, because I feel that whatever I do will not be good enough. I want it to be perfect.

<table>
<thead>
<tr>
<th>Statement</th>
<th>59 (30.3%)</th>
<th>49 (25.1%)</th>
<th>50 (25.6%)</th>
<th>7 (3.6%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>41 (21.0%)</td>
<td>53 (27.2%)</td>
<td>49 (25.1%)</td>
<td>19 (9.7%)</td>
</tr>
<tr>
<td></td>
<td>18 (9.2%)</td>
<td>25 (12.8%)</td>
<td>54 (27.7%)</td>
<td>56 (28.7%)</td>
</tr>
<tr>
<td></td>
<td>78 (40.0%)</td>
<td>45 (23.1%)</td>
<td>33 (16.9%)</td>
<td>16 (8.2%)</td>
</tr>
</tbody>
</table>

The Westside Test Anxiety Scale is a brief questionnaire on the factors that are self-assessed by the student which can impair their performance and was a form of assessment for the students who participated. For each question, most of the student’s answers fell under the moderately sometimes true category with the slightly seldom true category coming in second. The remaining answers were distributed among the Not at all, highly usually true and extremely always true categories, varying with each question.

DISCUSSION

Test anxiety is a common condition that lowers the student's performance in 10% of the school-aged population, which establishes the relation between participants’ level of anxiety and their grades. Most studies statistically show an inverse relationship between the participants’ academic performance and symptoms of test anxiety.

The presence of Test Anxiety in this study was based on the Westside Test Anxiety Scale. 42% of the participants were found to suffer from high levels of test anxiety. This is worrying when compared to other test anxiety studies. A study on Indian children concluded that about 25% of the students have experienced test anxiety. The younger age group (below 20 years of age) and those in the initial years of medical education (years 1 and 2) showed higher levels of test anxiety. This was similar to a study conducted in Rawalpindi, Pakistan in Wah medical college. This finding can be explained by an increase in the adaptive response of the students and better study techniques in their later years of medical education (years 3, 4, 5).

This research also focused on the type of test anxiety, i.e. whether it was facilitating or debilitating to the students. The data on the type of test anxiety was inconclusive in our study.

Over the years, research has consistently shown the involvement between test anxiety and academic performance. The previous studies have shown that the association between the two is negative. This particular study was in disagreement to that of Chapell et al. whose study revealed that there is an inverse relationship in which the students who were slightly anxious outscored the students with elevated levels of anxiety.

In conclusion, it was seen that test anxiety was present among 42% of the participants and was affected by various socio-demographic factors with females and those below 20 years of age showing higher levels of test anxiety. Our study as a whole was inconclusive about the facilitating or debilitating effects of test anxiety on student performance, however it was established that test anxiety affects an individual’s performance negatively.
The majority of participants reported reduced symptoms of test anxiety with certain forms of assessment such as MCQ’s, SAQ’s, OSPE and OSCE, but significantly increased symptoms with other forms of assessment such as Viva and seminars. Thus, we suggest modifying this form of assessment to make it less intimidating to the students. Counseling by an experienced health care professional is recommended for students with debilitating form of test anxiety.

REFERENCES

6. Kahan, Lawrence M. The correlation of test anxiety and academic performance of community college students., Capella University: School of Psychol; 2008:76.
The Effect of Anemia on Pregnancy and Fetal Outcome: GMC Hospital, Ajman, UAE

Anam Ahmed1*, Hareem Naasir1, Quraatul-ain Shafiq1, Baheer Naeem1, Yousif Ghelani,1 Rizwana Burhanuddin Shaikh2.

1Student Phase II College of Medicine, 2Department of Community Medicine, Gulf Medical University, Ajman, UAE

*Presenting Author

ABSTRACT

Objective: Anemia in pregnancy is a major public health problem globally. The aim of this study is to assess the effect of anemia on pregnancy and its effect on fetal outcome in mothers attending OPD in GMC Ajman, UAE.

Materials and Methods: A cross-sectional study was conducted from the records of 100 mothers with anemia and 100 non-anemic mothers who had delivered in the past 2 years at GMC Hospital, Ajman. Details of the mother and the newborn were collected in data extraction forms. Chi square test was done for associations. T-test est was done to compare mean values. P value <0.05 was considered as significant.

Results: Anemia was more common among women ≤30 years of age (59.6%), among non-Arabs (56.3%, p=0.02;), in women who are not insured (54.7%, p =0.02) and those who are booked cases (50%). The risk of anemia was found to be higher in unigravida and primipara. Anemia was classified as mild, moderate and severe, of which majority of the women had mild anemia (45%). Mothers with associated systemic conditions were more prone to anemia as compared to normal mothers (Diabetes-60%, Excessive vaginal bleeding-72%, (p=0.01) and Thalassemia-100%). More women with anemia underwent caesarian section (39%) and preterm deliveries were higher in mothers with anemia (77.8%, p=0.01). In terms of the fetal outcome, there was no significant difference in the birth weight of the babies of anemic and non-anemic mothers however the mean birth weight of the baby was lower in mothers with moderate to severe anemia.

Conclusion: This study demonstrated that there are more cases of mild anemia, the rate of caesarian section was higher and the mean birth weight of the baby is lower in anemic mothers. It is recommended that cases of anemia should be diagnosed early and be undergoing immediate management to prevent any further complications.

Keywords: Anemia, pregnancy, maternal outcome, fetal outcome
INTRODUCTION
Maternal anemia has become one of the major health concerns worldwide. It is associated with adverse maternal and fetal outcomes such as increased rates of maternal and prenatal mortality, premature delivery, low birth weight and certain anomalies. Anemia is a condition in which the number of red blood cells or their oxygen carrying capacity is insufficient to meet physiologic needs, which may vary by age, sex, altitude, smoking and pregnancy status. Normal levels of hemoglobin ranges from 13.5-17.2g/dl in men and 12.0-15.0g/dl in women. Anemia in pregnancy is as a hemoglobin concentration below 11 g/dl defined by the World Health Organization (WHO)\(^1,2\). Amongst several causes of anemia in pregnancy, Iron Deficiency Anemia (IDA) is the most prevalent.

Globally, overall prevalence of maternal anemia is 47.4\(^3\). The incidence is highest in developing countries and predominantly seen in Africa. Furthermore, the incidence of maternal anemia in the Eastern Mediterranean Region (EMR) ranges from 23\%- 54\(^4\). Locally in the UAE, the incidence is fairly low, it is estimated to be approximately 27.94\(^5\).

Besides Iron Deficiency Anemia, there are many other risk factors associated with maternal anemia that contribute to adverse fetal outcomes. Malnutrition, unhealthy lifestyle, hemoglobinopathies, age (<20 years or >35 years old), twin or multiple pregnancies, smoking or alcohol use, history of menstrual disorders or past infections are examples of these risk factors\(^5,6\).

There are numerous effects of anemia on pregnancy that may lead to adverse fetal and maternal outcomes. Iron and folic acid deficiency are the two most prevalent causes of anemia in pregnancy, which may lead to fetal complications such as low birth weight, preterm deliveries, developmental anomalies and even neonatal death. Globally the overall prevalence for low birth weight infants due to Iron deficiency anemia is 15.5\%- 20\(\%\), in which the levels are found to be higher in developing countries by 16.5\(\%\), especially Asia and Africa\(^7\). In the U.A.E, the overall prevalence of the effect of Iron Deficiency Anemia in pregnancy is higher than folate deficiency. As a result, the rates of low birth weight infants are more common than neural tube defects in infants. Moreover, maternal complications that are related to anemia include vaginal bleeding during the first trimester (18\%) and around 1.6 increases in the risk of preterm delivery\(^8\). Therefore, anemia during pregnancy has shown to cause quite substantial consequences.

Prevention and management of maternal anemia is crucial, especially Iron deficiency anemia that accounts for the most cases of anemia in pregnancy. There are four strategic approaches that have been established to prevent anemia and iron deficiency\(^9\). These include dietary change in order to increase iron intake, weekly iron supplementation regime to prevent gestational anemia, food fortification such as wheat and rice and lastly general public health measures. The last intervention is a highly crucial approach that includes child spacing, improving the nutritional status of women, sanitation, immunization, control of diarrheal diseases, etc\(^9,10\). Therefore, imposing a strengthened intervention program will not only improve the health of pregnant mothers but also the present and upcoming generation. The aim of this study is to assess the prevalence of anemia in pregnancy and its effect on fetal outcome in the U.A.E.
MATERIALS AND METHODS

This research study is a cross sectional record based study conducted in the GMC hospital, Ajman with the duration of the study being 6 months. It consisted of a study population of women who had delivered in GMC hospital, Ajman. The sample size involved all mothers with anemia who delivered in GMC Hospital, Ajman from 1st July 2012- 30th July 2014 and an equal number of mothers with no anemia who delivered in the same time period.

The study instrument used for data collection is a Performa prepared by the researchers after extensive review of literature. The Performa had three broad areas mainly, which includes socio-demographic profile of the mother, obstetrics, gynecological and medical history and details of the delivery, and lastly the details of the baby. Subject experts in OBG in Community Medicine then validated the Performa. A pilot test was conducted using 10 records; many of the variables had to be deleted from the Performa as such details were not available in the records.

The study was conducted only after getting the approval from the Research and Ethics Committee of the Gulf Medical University. Anonymity was maintained by not including the patient’s name in the Performa. Confidentiality was also maintained by allowing only the researchers and the statistical support unit access to review the data. Permission was taken from the academic office in the GMC Hospital, Ajman to gain access to previous medical records. Then relevant data were collected from the Medical Records Department based on the ICD-10 definition of anemia in pregnancy from all the records of deliveries during 1st July 2012- 30th July 2014.

The data management and analysis were initiated by presenting data in the Excel and were transferred into the IMB SPSS statistics software for further analysis. The data were presented by tables, graphs and charts. Chi-square test was done for associations. T-test was done to compare mean values. P value <0.05 was considered as significant.

RESULTS

![Pie Chart showing the Frequency of Severity of Anemia. (N=200)](chart)

Figure 1: Pie Chart showing the Frequency of Severity of Anemia. (N=200)
Table 1: Cross tabulation between maternal factors and the Level of Hb (N=200)

<table>
<thead>
<tr>
<th></th>
<th>Normal (Hb &gt;11g/dl)</th>
<th>Mild (Hb: 8-11g/dl)</th>
<th>Moderate-Severe (Hb &lt;8.0g/dl)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤30</td>
<td>40(40.4)</td>
<td>52(52.5)</td>
<td>7(7.1)</td>
<td>0.021</td>
</tr>
<tr>
<td>&gt;30</td>
<td>60(59.4)</td>
<td>38(37.6)</td>
<td>3(3)</td>
<td></td>
</tr>
<tr>
<td><strong>Nationality</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arab</td>
<td>55(60.4)</td>
<td>33(36.3)</td>
<td>3(3.3)</td>
<td>0.057</td>
</tr>
<tr>
<td>Non- Arab</td>
<td>45(43.7)</td>
<td>51(49.5)</td>
<td>7(6.8)</td>
<td></td>
</tr>
<tr>
<td><strong>Gravida</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1(5)</td>
<td>16(80)</td>
<td>3(15)</td>
<td>---</td>
</tr>
<tr>
<td>2-4</td>
<td>51(47.2)</td>
<td>55(50.9)</td>
<td>2(1.9)</td>
<td>---</td>
</tr>
<tr>
<td>≥5</td>
<td>48(66.7)</td>
<td>19(26.4)</td>
<td>5(6.9)</td>
<td></td>
</tr>
<tr>
<td><strong>Parity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uniparity (0-1)</td>
<td>12(20.7)</td>
<td>40(69)</td>
<td>6(10.3)</td>
<td></td>
</tr>
<tr>
<td>Multipara (2-4)</td>
<td>59(57.3)</td>
<td>42(40.8)</td>
<td>2(1.9)</td>
<td>---</td>
</tr>
<tr>
<td>GrandMultipara(≥5)</td>
<td>29(74.4)</td>
<td>8(20.5)</td>
<td>2(5.1)</td>
<td></td>
</tr>
<tr>
<td><strong>Live</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>12(25.5)</td>
<td>32(68.1)</td>
<td>3(6.4)</td>
<td>0.001</td>
</tr>
<tr>
<td>2-4</td>
<td>60(60)</td>
<td>38(38)</td>
<td>2(2)</td>
<td></td>
</tr>
<tr>
<td>≥5</td>
<td>28(53.8)</td>
<td>19(36.5)</td>
<td>5(9.6)</td>
<td></td>
</tr>
<tr>
<td><strong>Abortion</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-1</td>
<td>30(54.4)</td>
<td>23(41.8)</td>
<td>2(3.6)</td>
<td>0.528</td>
</tr>
<tr>
<td>2-4</td>
<td>6(60)</td>
<td>3(30)</td>
<td>1(10)</td>
<td></td>
</tr>
<tr>
<td><strong>Type of Delivery</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>100(100)</td>
<td>53(58.9)</td>
<td>8(80)</td>
<td>---</td>
</tr>
<tr>
<td>Caesarian Section</td>
<td>0(0)</td>
<td>37(41.1)</td>
<td>2(20)</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Cross tabulation between fetal factors and mean birth weight of the baby. (N=200)

<table>
<thead>
<tr>
<th></th>
<th>Mean Birth Weight</th>
<th>Standard Deviation</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level of Hb</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate-Severe (Hb &lt;8.0g/dl)</td>
<td>3.1178</td>
<td>0.47050</td>
<td>0.001</td>
</tr>
<tr>
<td>Mild (Hb:8-11g/dl)</td>
<td>2.8238</td>
<td>0.35444</td>
<td></td>
</tr>
<tr>
<td>Normal(Hb &gt;11gd/dl)</td>
<td>3.2875</td>
<td>0.38905</td>
<td></td>
</tr>
<tr>
<td><strong>Gestation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preterm</td>
<td>2.8150</td>
<td>0.53474</td>
<td></td>
</tr>
<tr>
<td>Term</td>
<td>3.2162</td>
<td>0.41506</td>
<td></td>
</tr>
<tr>
<td>Post Dated</td>
<td>3.4109</td>
<td>0.35439</td>
<td></td>
</tr>
<tr>
<td><strong>Booked</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>3.2379</td>
<td>0.42687</td>
<td>0.568</td>
</tr>
<tr>
<td>No</td>
<td>3.2020</td>
<td>0.39931</td>
<td></td>
</tr>
<tr>
<td><strong>Insured</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 1: Comparison of delivery type and anemia severity

<table>
<thead>
<tr>
<th>Type of Delivery</th>
<th>Yes</th>
<th>No</th>
<th>0.382</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal Delivery</td>
<td>3.2443</td>
<td>0.44880</td>
<td></td>
</tr>
<tr>
<td>Caesarian Section</td>
<td>3.1781</td>
<td>0.43532</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1 shows that the majority of cases of anemia are of mild severity (45%). Table 1 concluded that cases of anemic women of ≤30 years of age (52.5%) and those who are non-Arab (49.5%) are significantly of mild severity. Moreover, mild anemia is significantly higher in mothers with gravida 1 (80%), unipara (69%), live one (68.1%) and abortion one (41.8%). Our study also depicted that majority of cases of anemia underwent normal deliveries (58.9%). However, only cases of anemia underwent caesarian deliveries (41.1%). Table 2 showed that the mean birth weight of the baby is lowest in women with mild anemia, those who delivered at preterm gestation and in those who underwent caesarian section.

DISCUSSION

The prevalence of anemia assessed at a global scale demonstrates that it is highly prevalent among pregnant women. A study extracted from the WHO Vitamin and Mineral Nutrition Information System for 1993-2005 concluded that out of a survey data covering 48.8% of global population, 41.8% (56 million) of pregnant women were anemic amongst the estimated anemia prevalence being 47.4%. In our study (Table 1), anemia in pregnancy was the essential focus as pregnant women are among the most vulnerable group to get anemia as in the aforementioned study. While considering the age group among the anemic pregnant women, we found out that mothers below or equal to the age of thirty years were most affected as opposed to women above thirty years of age. Likewise, when comparing it to a study conducted in Ethiopia, 27.6% of women aged between 18 to 26, 30.7% women aged from 26 to 34 and the least being (11.8%) women above or equal to 34 years of age were categorized as anemic. This socio-demographic data precisely favors the finding of our study when assorting anemic pregnant women into particular age groups. Our results also coincide with another study on anemia and pregnancy-related mortality that states that the risk of anemia is more in teenage primigravida women in both developing and developed countries. Therefore, younger females are more prone to anemia than women more than thirty years of age.

In our study, women who were of non-Arab ethnicity were more likely to be affected by anemia during pregnancy as compared to Arab pregnant women. However, the World Health Organization (WHO) review of nationally representative surveys conducted from 1995 to 2005 stated that amongst the 42% of pregnant women having anemia worldwide, 90% of them live in Africa or Asia. This clarifies that African women are amongst the majority of pregnant women who are affected with anemia, but a large amount of Asian pregnant women are also anemic collectively involving Arab and non-Arab women. Hence, making it ambiguous whether Arab or non-Arab women contribute most to being anemic during their pregnancy. However, another study executed in Northern Nigeria claim that amongst the 58.27 million women who have anemia during their pregnancy, 55.75 million (95.7%) of those are from a developing country. Additionally, recent studies show that an estimate of 60% of pregnant women residing in developing nations is likely to be anemic with around 7% of them falling under severe anemia. This can be denoted as Arab countries having a lower prevalence of anemia since most Arab countries are developed countries.

Furthermore, our results concluded that women who were not insured (54.7%) and were booked (50%) had higher frequency of anemia. On contrary to our results, a study performed at a hospital in Northern Nigeria observed that pregnant women who
did late booking for antenatal care had a higher risk for anemia. Women who booked in their first trimester had a lower risk for developing anemia than those who booked during their second and third trimester (around 83% of pregnant women). On the other hand, our study showed that nearly half of the women who booked had a higher frequency of anemia than those who had not booked (28% had anemia while 48% did not have anemia) suggesting it to be not as significant.

Another study was conducted in southwest Nigeria, observed that a higher frequency of anemia was noted in women who booked during their 2nd or 3rd trimester, signifying that women in our study most probably registered in for booking during mid-late pregnancy. In terms of women who were not insured had higher frequency of anemia indicating that there might be an association between socio-economic status and pregnancy. This might be because patients who are not insured may not be comfortable in paying the amount of treatment and supplements and this factor must have contributed to this finding.

Another study was conducted in southwest Nigeria, observed that a higher frequency of anemia was noted in women who booked during their 2nd or 3rd trimester, signifying that women in our study most probably registered in for booking during mid-late pregnancy. Another study based on the effect of high parity on the occurrence of anemia during pregnancy observed that as the parity increases, the risk of getting anemia also increases. These findings are not consistent with our results. However, this may be because as we derived from our findings that even though anemia was substantially higher in mothers with gravida one (80%), para one (69%), live (birth) one (68.1%) and abortion one (41.8%), they had the mild form of anemia (Figure 1). Moreover, our results depicted that cases of mild anemia decreased as the number of obstetric history (GPLA) increased, suggesting that women with high parity and/or gravida will most likely suffer from moderate to severe anemia.

Moving onto to the effect of anemia in pregnancy on fetal outcome, the results were as follows (Table 2): From the results of our study, we concluded that majority of the cases of mild anemia, the most prevalent type, underwent normal deliveries (58.9%). However, only cases of anemia underwent caesarian deliveries (41.1%). Furthermore, regarding the gestation time, there was a significantly higher number of preterm deliveries (77.8%) in cases of anemia. A similar study on independent risk factors during maternal anemia was conducted in Beer-Sheva, Israel. A sample of 153,396 deliveries that have occurred in the Soroka University Medical Center was analyzed. Out of which 13,204 (8.6%) were anemic mothers. Results showed that the rates of both caesarian and preterm deliveries in anemic mothers were higher (20.4% and 10.7% respectively) compared to non-anemic mothers.

Another complication of anemia in pregnancy is low birth weight of the baby (<2.5kg), since majority of anemic cases delivered are of preterm gestation. In our study, we observed that the mean birth weight of the baby was significantly lower, but still within the normal ranges, in mothers with moderate-severe anemia and in those who delivered on preterm gestation. A study on the effect of severity of maternal anemia on various perinatal outcomes was held in Tanzania. A sample of 1721 mothers was evaluated. It was concluded that the prevalence of anemia was 68%. Out of which 5.8% were of moderate-severe anemia and the prevalence of preterm deliveries and low birth weight of the baby were 17% and 14% respectively. Similarly, a study conducted in India stated that increase in severity of anemia is associated with decrease in birth weight of the baby due to increased rate of preterm delivery, eventually, leading to an increase in the rate of fetal mortality.

Furthermore, regarding the mode of delivery, our study concluded that mean birth weight of the baby is slightly higher in normal deliveries than in caesarian section. A study of all low birth weight infants (213) conducted in the UK recorded that 103 infants were born through vaginal delivery and the remaining 110 were born by caesarian. The same study also concluded that the rate of caesarian deliveries is slightly higher due to increased rate of premature deliveries.
Lastly, according to our study it was also concluded that the cases of anemia significantly increased with systemic complications. Out of which, anemia was seen in Diabetes (60%), Thalassemia (100%) and excessive vaginal bleeding (72%) were the most common conditions noted in our study. A study conducted in Hong Kong on a sample size of 242 mothers, stated that the incidence of anemia in diabetes and thalassemia was 4.6% and 9.4% respectively. Another study of 240 mothers was held in Tanzania, which interpreted that the rate of anemia in mothers with excessive vaginal bleeding was 20.5%.

One limitation of this study is the small sample size and the fact that it was done in one tertiary hospital and hence the results cannot be generalized. This study demonstrated that there are more cases of mild anemia, the rate of caesarian section done in one tertiary hospital and hence the res...

REFERENCES

5. Fareh I, Rizk DEE. Obstetric impact of anemia in pregnant women in the United Arab Emirates. 2005;440-444
Unrecognized dyslipidemia among patients presented with first attack of acute coronary syndrome (ACS) in a multi-ethnic population in GMC hospital, Ajman, UAE (Dyslipidemia-ACS UAE Study)

Mohammed A. Fathi¹, Ehab M Esheiba¹, Ani Purushothaman²*

¹Departments of Cardiology, ²Department of Intensive Care, Gulf Medical College Hospital and Research Centre, Ajman, UAE

*Presenting Author

ABSTRACT

Introduction: Acute coronary syndrome (ACS) is a major reason for hospitalization in our country. Dyslipidemia has been identified as one of the major modifiable risk factors for Coronary Artery Disease (CAD). Our clinical observation was that many patients presenting with first ACS in Ajman, had no known risk factors, yet their routine investigations revealed lipid derangements. The aim of this study was to determine the prevalence of unrecognized dyslipidemia and its relation to other modifiable risk factors in an Ajman cohort of patients with first ACS.

Materials and Methods: All patients who visited the Department of Cardiology during the period of January 2006 to December 2012 with first attack of ACS without history of previous coronary artery disease or dyslipidemia were studied through a descriptive epidemiological approach. Case records of these were first reviewed, data collected and questionnaires were filled. From this, data was entered into excel spread sheet and was transformed to SPSS 21 version for statistical analysis.

Results: A total of 438 case records were studied and 169 patients met inclusion criteria. Out of these, 141 patients (83.4%) were unrecognized dyslipidemics and 28 patients (16.6%) were non-dyslipidemics. We documented the demographic and clinical characteristics of the 141 unrecognized dyslipidemics along with other comorbid conditions. We found that most of the patients (54/141, 38.3%) were less than 40 years, 40/141 (28.4%) were between 41-50 years, and 47/141 (33.4%) were above 50 years. Majority of our patients were males (109/141, 77.3%) and Asians (74/141, 54%) were the major ethnic group being affected, followed by the Arabs (52/141, 38%). We also found that smoking was the most common risk factor encountered in our population (57/141, 40.4%), followed by family history of early coronary artery disease (40/141, 36.7%), hypertension (47/141, 33.3%) and diabetes (29/141, 20.6%). 82 patients out of the 141 patients presented with high systolic and diastolic BP. During presentation non ST-segment elevation-ACS was a more frequent diagnosis (120/141, 85.1%) than ST-segment elevation myocardial infarction (13/141, 9.2%) or unstable angina (8/141, 5.7%). The LDL levels >100 mg/dl in majority (123/141, 88.6%) of the patients.

Conclusion: Dyslipidemia was one the major risk factors which was widely prevalent and it went unrecognized until being detected during the first presentation with ACS. There were also other risk factors which contributed to the presentation of ACS at a young age, especially in males. This research implied the importance of creating more awareness and maintaining strict control of lipid levels in at risk patients. It provides useful information to health authorities, to design locally relevant interventions.

Keywords: Acute coronary syndrome (ACS), dyslipidemia
INTRODUCTION

Coronary heart disease (CHD) has become a true pandemic respecting no borders. In the coming years, it will be the greatest epidemic mankind has ever seen, unless we reverse the trend by concentrating research on its cause and prevention. Recent estimates by the World Health Organization (WHO) highlight cardiovascular disorders as one of the leading causes of death. Future projections of the global burden of disease indicate that ischemic heart diseases are becoming the most significant cause for disability adjusted life years. It has been projected that between 1990 and 2020, cardiovascular disease mortality in the Middle East countries will increase by 146% for women and 174% for men.

Dyslipidemia has been identified as one of the major modifiable risk factors for coronary artery disease; it is therefore a serious public health issue in the healthcare system, and in the nation at large. Over the past 4 decades, researches have consistently shown the burden of dyslipidemia to be very high, in terms of mortality, morbidity, and also medical costs. The W.H.O. has reported that dyslipidemia was associated with more than half of the cases of ischemic heart disease globally and lead to more than 4 million deaths every year.

With regards to dyslipidemia, the risk factors for atherosclerotic cardiovascular disease (ASCVD) are high total cholesterol (TC) or low-density lipoprotein cholesterol (LDL-C) levels and low high-density lipoprotein cholesterol (HDL-C) levels. Other risk factors are age, male sex, tobacco use, high blood pressure, and diabetes mellitus.

The Adult Treatment Panel III of the National Cholesterol Education Program (NCEP ATP-III) has issued evidence-based guidelines emphasized the significance of an intensified lipid-lowering treatment to improve outcomes. It highlighted the current gap in the treatment of CHD that existed in hospitals and in outpatient settings; recognized the high number of eligible patients who are not receiving any therapy; and correlated this with ample opportunity for reducing morbidity and mortality with appropriate treatment.

The epidemiological characteristics of ACS patients and the pattern of their management change over time, mainly due to temporal trends in the prevalence of coronary risk factors, differences in the availability of healthcare resources and facilities, and the varying degree of implementation of treatment guidelines. In this context, repeated surveys are needed to account for the dynamic nature of these variables and to provide relevant, comprehensive and updated information.

Although there is high prevalence of dyslipidemia and diabetes mellitus in the Gulf region, especially in the United Arab Emirates, probably due to the varied ethnic origins and sedentary lifestyle, there are not enough trials targeting this population. Our clinical observation was that many patients presenting with first ACS in Ajman, had no known risk factors. During their routine investigations on admission, different derangements were discovered which would include elevated lipid levels or undiagnosed diabetes mellitus.

The objective of this study was to determine the prevalence of unrecognized dyslipidemia and its relation to other modifiable risk factors in a cohort of patients who presented with first attack of acute coronary syndrome.

MATERIALS AND METHODS

Design

This was a retrospective study conducted by the department of Cardiology in the GMC hospital, Ajman. The population was studied through a descriptive epidemiological approach.

Study Population

This included patients, irrespective of age, nationality and gender, who presented with first attack of ACS to the Department of Cardiology during the period of 2006 to 2012. It included patients with any past history except those in the exclusion criteria. Exclusion criteria included patients with known history of coronary artery disease,
known dyslipidemia and case records with incomplete data. A total of 438 case records were studied, out of which 169 patients met the inclusion criteria.

**Methods**
A descriptive epidemiological study was conducted. The questionnaire included questions under the domains of socio-demographic characteristics, family history, clinical data and biochemical parameters. Co-morbidities were recorded based on the Charlson Co morbidity Index. Data was collected by reviewing the case records in the medical records department and questionnaires were filled. From this, data was entered into excel spread sheet and was transformed to SPSS 21 version for statistical analysis. Based on that, report was prepared and the findings were disseminated.

**RESULTS**

![Figure 1: Distribution of dyslipidemia among the ACS patients (N=169)](image)

Figure 1 shows that among the ACS patients, 141 patients (83%) were unrecognized dyslipidemic and 28 patients (17%) were non-dyslipidemic.

**Demographic characteristics and comorbid conditions**

Table 1: Distribution of demographic characteristics among the unrecognized dyslipidemic ACS patients (N=141)

<table>
<thead>
<tr>
<th>Socio-demographic characteristics</th>
<th>Groups</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age group in years</td>
<td>≤40 years</td>
<td>54</td>
<td>38.3</td>
</tr>
<tr>
<td></td>
<td>41-50 Years</td>
<td>40</td>
<td>28.4</td>
</tr>
<tr>
<td></td>
<td>51-60 years</td>
<td>39</td>
<td>27.7</td>
</tr>
<tr>
<td></td>
<td>&gt;60 years</td>
<td>8</td>
<td>5.7</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>109</td>
<td>77.3</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>32</td>
<td>22.7</td>
</tr>
<tr>
<td>Ethnicity*</td>
<td>Asians</td>
<td>74</td>
<td>54.0</td>
</tr>
<tr>
<td></td>
<td>Arabs</td>
<td>52</td>
<td>38.0</td>
</tr>
<tr>
<td></td>
<td>European/African</td>
<td>11</td>
<td>8.0</td>
</tr>
</tbody>
</table>
Table 1 shows the demographic characteristics: 54 patients (38.3%) were ≤40 years, 40 patients (28.4%) were between 41-50 years, 39 patients (27.7%) between 51-60 years and only 8 patients (5.7%) were more than 60 years. Regarding gender comparison, there was a male predominance, 109 patients (77.3%). Regarding, the ethnicity of our patients, 74 (54%) were Asians, followed by Arabs 52 (38%) and Europeans or Africans 11 (8%). There were 4 cases with missing data.

![Graph showing distribution of personal habits among unrecognized dyslipidemic ACS patients](image)

Figure 2: Distribution of personal habits among the unrecognized dyslipidemic ACS patients (N=141)

Figure 2 shows that smoking was a habit in 57 patients (40.4%). Alcohol consumption was found in only 18 patients (12.8%).

![Graph showing distribution of different co-morbid conditions among unrecognized dyslipidemic ACS patients](image)

Figure 3: Distribution of different co-morbid conditions among the unrecognized dyslipidemic ACS patients (N=141)

Figure 3 shows that a history of hypertension was recorded in 47/141 patients (33.3%). 29 patients were known diabetics (20.6% of patients). Other past medical history was noted among 6 patients (4.3%) and included anxiety, hypothyroidism, COPD, bronchial asthma and epilepsy among others.
Table 2: Distribution of dyslipidemia among ACS patients with and without family history of CAD

<table>
<thead>
<tr>
<th>Family History</th>
<th>Groups</th>
<th>Dyslipidemia</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Non Dyslipidemic</td>
<td>Unrecognized Dyslipidemic</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>CAD</td>
<td>Yes</td>
<td>3</td>
<td>7.0</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>19</td>
<td>21.6</td>
</tr>
</tbody>
</table>

*p value <0.05 (statistically significant)

In table 2, it was observed that 43 ACS patients had a family history of early coronary artery disease, and among them 40 patients (93%) were found to have unrecognized dyslipidemia. This was found to be statistically significant with a p value <0.05.

**Clinical characteristics**

Table 3: Distribution of the type of ACS during presentation (N=141):

<table>
<thead>
<tr>
<th>Variables</th>
<th>Groups</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Presentation</td>
<td>STEMI</td>
<td>13</td>
<td>9.2</td>
</tr>
<tr>
<td></td>
<td>NSTEMI</td>
<td>120</td>
<td>85.1</td>
</tr>
<tr>
<td></td>
<td>UA</td>
<td>8</td>
<td>5.7</td>
</tr>
</tbody>
</table>

Table 3 shows that NSTEMI was diagnosed in a majority of 120 patients (85.1%) as compared to STEMI in 13 patients (9.2%) and Unstable Angina in 8 patients (5.7%).

Table 4: Distribution of LDL values among the unrecognized dyslipidemic ACS patients (N=141):

<table>
<thead>
<tr>
<th>Variables</th>
<th>Groups</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDL</td>
<td>Optimal (&lt;100)</td>
<td>16</td>
<td>11.5</td>
</tr>
<tr>
<td></td>
<td>Near optimal (100-129)</td>
<td>56</td>
<td>40.3</td>
</tr>
<tr>
<td></td>
<td>Borderline (130-159)</td>
<td>45</td>
<td>32.4</td>
</tr>
<tr>
<td></td>
<td>High risk (160-189)</td>
<td>14</td>
<td>10.1</td>
</tr>
<tr>
<td></td>
<td>very high risk (&gt;=190)</td>
<td>8</td>
<td>5.8</td>
</tr>
</tbody>
</table>

Table 4 shows that the LDL values were <100 mg/dL for only 16 patients (11.5%); whereas it was >100mg/dL (88.5%) for the remaining, i.e. between 100-129 mg/dL for 56 patients (40.3%); and >130 mg/dL, for 67 patients (48.3%). There were only 3 missing data.
Table 5(A): Distribution of HDL levels among males with unrecognized dyslipidemia and ACS (N=141)

<table>
<thead>
<tr>
<th>Gender</th>
<th>HDL Total</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal (≥40)</td>
<td>Abnormal (&lt;40)</td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td></td>
<td>23</td>
<td>21.7</td>
<td>83</td>
</tr>
</tbody>
</table>

Table 5(B): Distribution of HDL levels among females with unrecognized dyslipidemia and ACS (N=141)

<table>
<thead>
<tr>
<th>Gender</th>
<th>HDL Total</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal (≥50)</td>
<td>Abnormal (&lt;50)</td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>12.5</td>
<td>28</td>
</tr>
</tbody>
</table>

Table 5 (A & B) shows that the HDL values were abnormal for 83 (78.3%) males and 28 (87.5%) females. There were only 3 missing data.

**DISCUSSION**

In our patients presenting with first ACS, there was underlying unrecognized dyslipidemia present in 83.4% of the cases. This finding revealed that dyslipidemia was highly prevalent in ACS patients and this has been confirmed in numerous other studies\(^\text{10-12}\).

On evaluating the epidemiological characteristics of these unrecognized dyslipidemic patients; it was alarming to find a major proportion to be young. In comparison to the results of UAE-ACS Registry\(^\text{13}\) and SPACE registry\(^\text{14}\) where the population age group was older and majority were below 40 years (38.3%) with decreasing incidence as the age progressed. This has important implications and could be partially explained by the large number of young adults who come to the UAE for employment. These young people have risk factors like smoking, dietary imbalance and stress leading to dyslipidemia, hypertension and diabetes, which are sufficient for them to suffer MI. This was recently shown in an analysis of young individuals with acute MI by Prashant Joshi et al\(^\text{15}\). Also supported by the study conducted by Andreas et al\(^\text{14}\) which reported that cardiovascular risk factors in the young ACS patients <35 years were different from older ACS patients and dyslipidemia was one of the most important predisposing factor. This calls for strict primary prevention especially in this particular segment of society.

We found that majority of our patients were males (77.3%), which confirmed male gender as one of the non-modifiable risk factors for coronary heart disease\(^\text{11,13}\). Rosengarten et al\(^\text{17}\) found fewer women than men, aged <65 years develop ACS. One should bear in mind that though women have lower CAD rates than men, environmental and lifestyle factors that cause high CAD rates in men can also influence women\(^\text{18}\).
It is worth notice that the ethnicity of our population was mainly Asian (54%) and followed by Arabs (38%). Recent studies found that South Asians have two-fold increased rate of ACS incidence; they were younger, had lower socio-economic status, with more social and occupational stresses, more cigarette smokers than other patients\textsuperscript{19,20}. This was supported by Prashant et al\textsuperscript{15} who reported that the South Asians have high rates of acute myocardial infarction (AMI) at younger ages compared with individuals from other countries. Also a cross sectional analysis of mortality by country of birth, done in England by S. Wild et al\textsuperscript{21}, found that South Asians had mortality mainly from CAD.

Recent studies have shown that there is an association of the apolipoprotein E (apoE) genotype with the incidence of acute coronary syndromes in young South Asians. This genotype also adversely affects LDL and HDL cholesterol levels, both of which contribute to premature atherosclerosis\textsuperscript{22}. This might necessitates further research about the genotypes of such population in our community.

Regarding the comorbid conditions present in our population, it was found that smoking was the most common risk factor encountered (40.4%), followed by family history of early coronary artery disease (36.7%), hypertension (33.3%) and diabetes (20.6%).

In CYPACS Study\textsuperscript{11} smoking is found as one of the most frequent risk factor for ACS (48%) in addition to dyslipidemia and others. Other studies like SPACE registry (66%)\textsuperscript{14}, Gulf RACE registry (36.6%)\textsuperscript{23}, UAE ACS registry (46.4%)\textsuperscript{13}, M. Parajuli et al. (55.2%)\textsuperscript{24}, and Abraham et al. (50.4%)\textsuperscript{25}. This goes in concordance with our study results.

Alcohol consumption was recorded in only 12.8% of our population which was compatible with some recent studies\textsuperscript{26}. Our finding was in contrast to the findings of Parajuli et al\textsuperscript{24} where they found a significant proportion (30.6%) had excessive use of alcohol.

One third of our study population where hypertensive. History of hypertension was observed in 37% of the ACS patients by Bhalli et al\textsuperscript{27} and in TARGET study\textsuperscript{12}, it constituted 67.9% of the total ACS patients.

Diabetes Mellitus is also one of the major risk factors for ACS\textsuperscript{28,29}. Our results (20.6%) agreed with the TARGET study (27.5%)\textsuperscript{12} and UAE ACS registry (38.9%)\textsuperscript{13}.

Family history of early coronary artery disease is considered one of the three most important risk factors in the young ACS patients, along with dyslipidemia and smoking, supported by Andreas et al\textsuperscript{16} and CYPACS Study\textsuperscript{11} where they documented 55% and 34.6 % respectively. This was similar to our observation of 36.7%. The disturbing fact is that despite having a positive family history, these patients had poor awareness which had prevented early detection of possible risk status. Therefore this clearly emphasizes the need for creating more awareness about the importance of positive family history.

Our study also documented the type of ACS presentation and it was revealed that NSTE-ACS patients were the majority (85.1%) as compared to STEMI (9.2%) and Unstable Angina (5.7%). Our findings are consistent with literature findings and with scientific data from recent surveys. They indicate that ACS episodes occur more commonly these days in the form of NSTE-ACS, as opposed to STEMI. Over the years, the relationship between STEMI and NSTE-ACS has changed, resulting in increasing presentation of NSTE-ACS, though there has been no clear explanation for this change. It is possibly due to the significant efforts aiming at prevention of coronary heart disease for the past 20 years\textsuperscript{30,31}. 
Contradicting our findings was the CYPACS study\textsuperscript{11} where STEMI (45\%) was found in patients with no previous CAD and NSTEMI (41.3\%) was found in previous CAD patients. Also, our data was against the findings of the UAE ACS registry\textsuperscript{13} which recorded more cases of STEMI than NSTEMI or unstable angina.

Laboratory findings revealed that LDL levels of more than 100 mg/dL were found in majority of the cases (88.6\%) with near optimal and borderline values occurring more frequently (40.3\% and 32.4\%, respectively). This pointed towards the significance of stringent control of lipids. Although optimal levels does not rule out the possibility of developing CAD yet it is an important modifiable risk factor. Comparably, high rate of dyslipidemia was found in the TARGET Study (57.4\%)\textsuperscript{12}, the CYPACS study (49\%)\textsuperscript{11} and in the study conducted by Addulla et al\textsuperscript{10}.

**Strength and Limitations**

Strength of our study is our population which was from a multiethnic background. A limitation of our study was the number of patients which was less which made it difficult to apply different tests of association.

Due to our study setting which did not have invasive management facilities, certain complicated cases were transferred to other facilities and therefore there were incomplete investigations. These records with incomplete data had to be excluded from the study.

**CONCLUSIONS**

Dyslipidemia is a highly predictable, independent, modifiable risk factor which is widely prevalent. In our population, it went unrecognized until being detected during the first presentation with ACS. This research was a step towards identifying the magnitude and trend of dyslipidemia in our local population. It implies the importance of maintaining strict control of lipid levels in at risk groups.

There were also other risk factors which contributed to the presentation of ACS at a young age, especially in males. Smoking is undoubtedly a major contributor which has to be curbed from this society. We also stress on creating awareness for early assessment of the risk status, especially in those with a family history of coronary artery disease and South Asian ethnic background. The alarmingly high rate of risk factors remains a cause for concern and a challenge that needs to be tackled. It provides ample opportunity for reducing mortality and morbidity.

In addition, our study also provides useful information for health authorities, to design locally relevant interventions, keeping in mind the socio-cultural factors, and can predict the impact of determinants on these patients. Thus it would make prevention, early detection and appropriate management of ACS possible.

**ETHICAL CONSIDERATIONS**

Approval was obtained from the Ethics and Research committees of Gulf Medical University and the management of GMC hospital to conduct this study. Anonymity of the study subjects were maintained by not identifying them by their names and confidentiality of the research data was maintained.
REFERENCES
10. Addulla A and Mohamed S. Prevalence and Pattern of Dyslipidemia In Acute Coronary Syndrome Patients Admitted to Medical Intensive Care Unit in Zagazig University Hospital, Egypt. World Journal of Medical Research 2014, 3:3.
23. Suwaidi JA, Khalid AH, Nidal A, Rajvir S, Ahmad H, Husam AF. In-hospital complications and one-year outcome of acute coronary syndrome in hypertensive subjects; findings from the 2nd Gulf registry of acute cardiac events(Gulf-Race 2).


A Unique Case of Upper and Lower Gi Bleeding In a Cirrhotic Patient

Sithara.K.Balagopal¹, Kalpana Golani²
¹Department of Gastroenterology, GMC Hospital & Research Centre, Ajman, UAE, ²Histopathology department, CABRI, Gulf Medical University, Ajman, UAE

*Presenting Author

ABSTRACT

Introduction: Cirrhotic patients are at a heightened risk for surgical and anesthesia related complications and particularly, these complications depend on the severity of liver dysfunction. Gastroenterologists are often very hesitant to perform invasive procedures because of bleeding and decompensation of the liver disease which are encountered in the postprocedural phase. However in certain situations, it is imperative to perform high risk procedures to prevent exsanguination. This case represents such a rare challenging situation when a patient presented with hematochezia and melena for the first time and was detected to be harbouring chronic liver disease complicated with large rectal polyp, Grade 3 esophageal varices and mesenteric cyst. The histopathology of the polyp showed colitis cystica profunda which is another unique feature.

Case Description: 54 year old lady presented for the first time with history of melena, severe colicky pain abdomen and frank hematochezia of 7 days duration. On evaluation, she had stigmata of CLD (chronic liver disease) further confirmed on imaging. Investigations confirmed child B cirrhosis. After hemodynamic stabilisation, colonoscopy was done which showed 2x1.5cm hyperemic pedunculated polyp in the rectosigmoid junction causing partial luminal obstruction. Upper GI endoscopy performed in view of melena, showed large esophageal varices and band ligation was done. Since she continued to have hematochezia despite plasma, platelet transfusions, polypectomy consent was taken under high risk and polyp removed enbloc using adrenaline injection at the base of the polyp coupled with endoloop, snare and cautery. The bleeding was controlled and the patient did not develop any immediate/delayed post-polypectomy bleeding (PPB) and is asymptomatic on follow up.

Conclusion: Cirrhosis by itself is not a contraindication for colonoscopic polypectomy. Nevertheless, Child Pugh class B, C cirrhotics are at a very high risk of Post-polypectomy bleeding(PPB) that occur immediately (IPPB) or even may be delayed up to 30 days(DPPB). Colonoscopic polypectomy with an endoloop is much safer than conventional polypectomy and should be considered in high risk patients with potential for PPB.

Keywords: Chronic liver disease (CLD), Post polypectomy bleeding (PPB), Immediate post polypectomy bleeding (IPPB), Delayed post polypectomy bleeding (DPPB).
INTRODUCTION

Patients with cirrhosis have demonstrated greater risks for surgical and anesthesia related complications. Majority of these patients (70-76%) have coagulopathy and coupled with thrombocytopenia increases the risk of bleeding during invasive procedures\(^1\). Particularly, these procedure-related complications are associated with the severity of liver dysfunction. Studies have reported mortality rates of 10%, 17%, and 63 % in cirrhotic patients with Child-Pugh class A, B, and C, respectively\(^2\). Gastroenterologists are often hesitant to perform major therapeutic procedures in these patients because of the increased risk of bleeding and the complications that occur in the post procedural phase, in the form of further decompensation of liver disease (increasing jaundice, encephalopathy, bleeding and ascites). Therefore major therapeutic procedures are usually contraindicated in these patients. However there are challenging situations when the therapeutic procedures will have to be taken up under high risk as in a case of frank bleeding from a large colonic polyp to prevent hemorrhagic shock. Post-polypectomy bleeding (PPB) is one of the most common complication after colonoscopic polypectomy. However, there is dearth of literature on the risk of post-polypectomy bleeding and related complications in cirrhotic patients. PPB can occur immediately following the procedure or can be delayed up to even 30 days. Rates of immediate PPB(IPPB) has been reported to range from 2.1 to 9% in healthy subjects. An age ≥60 years, chronic liver disease, a polyp size greater than 10 mm, hypertension, thrombocytopenia, coagulopathy etc are known risk factors for PPB\(^3\). This case highlights a very challenging situation where in a patient had to be taken up despite the presence of all the risk factors and comorbidities (considering liver disease, age, hypertension and the polyp size was > 20mm, coagulopathy) to prevent hemorrhagic shock and related mortality.

CASE DESCRIPTION

We discuss a case of 54 year old lady who presented with severe colicky lower abdominal pain followed by loose stools and frank hematochezia of 7 days duration. She was initially treated outside as colitis and given a course of antibiotics and analgesics, however as the symptoms worsened and she started developing melena and coffee ground vomiting, following medications, she was referred to our institute. On examination, her vital signs revealed pulse 100/min, BP 90/55 mm of Hg, respiratory rate 30/min and O\(_2\) saturation was 100% on room air. She had peripheral stigmata of liver disease and abdominal examination revealed firm hepatomegaly and ascites, therefore a possibility of chronic liver disease with variceal bleed was considered and she was further worked up. Investigations revealed hemoglobin -10.2gm/dl, Platelet count was 1.7 lakhs/ul, INR was 1.4, LFT showed bilirubin of 1.7mg/dl and albumin of 3.8mg/dl. Serum creatinine was 1.0 mg/dl. Transaminases were normal. Ascitic fluid analysis showed SAAG (serum Ascites albumin gradient) of 1.9 confirming portal hypertension. USG followed by Contrast enhanced CT abdomen confirmed chronic liver disease with portal hypertension and large mesenteric cyst. Since this patient had a strong family h/o liver disease, she was evaluated to rule out hereditary causes as well.(Viral markers, ANA, Copper, iron profile etc were noncontributary).After hemodynamic stabilisation, she was taken up for Upper GI endoscopy and colonoscopy under high risk consent since she had child B cirrhosis and high risk of decompensation subsequently. Upper GI endoscopy showed large (Grade111 x 2) columns of esophageal varices with stigmata of recent bleed. She underwent band
ligation of the esophageal varices (using Olympus Exera 111 CLV 190 Upper GI endoscope and multiband ligator, (Wilson Cook) and 6 variceal bands were deployed). Colonoscopy done in the same sitting showed large 2x1.5cm hyperemic pedunculated polyp in the rectosigmoid junction causing intussusception and partial luminal obstruction. Since she continued to have hematochezia even after plasma and platelet transfusions, a high risk informed consent was taken for polypectomy and the procedure was taken up in the second sitting with standard precautions, vitamin K injections, blood, plasma transfusions etc. Colonoscopic polypectomy was performed using a standard colonoscope (Olympus Exera 111 CLV 190). Pre injection of the polyp base with saline and adrenaline (1 in 10,000) was performed to prevent bleeding. An endoloop was placed around the base of the polyp and was slowly tightened to include the stalk to prevent the potential risk of post polypectomy hemorrhage. An electrosurgical unit was set according to the manufacturer’s instructions, and blended current was used for resection with a rotatable snare used above the endoloop. The polyp was removed en bloc using snare polypectomy forceps, endoloop (Olympus) and cautery and sent for histopathological evaluation. There was no bleeding from the polypectomy site and the patient tolerated the procedure without any complications. She improved, melena and hematochezia settled and did not develop any further decompensation of the liver disease and was discharged on ursodeoxycholic acid, lactulose, beta blocker prophylaxis etc. She was followed up 1 week and 4 weeks after the procedure, was asymptomatic and did not develop any immediate/delayed PPB. The histopathology report of the polyp showed mucosal prolapse syndrome (Colitis cystica profunda) and there was no evidence of dysplasia. Also CEA (carcinoembryonic antigen) was normal. Follow up Upper GI endoscopy done after 6 weeks showed obliterated esophageal varices.

Figure 1: Showing the large pedunculated polyp
Figure 2: Endoloop placed at the pedicle of the polyp

Figure 3: Band ligation of esophageal varix
DISCUSSION

Cirrhosis leads to a state of hyperdynamic circulation with increase in cardiac output associated with decreased systemic vascular resistance. Patients with cirrhosis have greater risks for invasive and anesthesia-related complications. Moreover, in cirrhotics, alterations in the systemic circulation occur due to arteriovenous shunting and reduced splanchnic circulation. The baseline decreased hepatic perfusion results in making them more susceptible to hypoxemia and hypotension during the perioperative phase. Anaesthetic agents and vasoactive drugs further diminish the hepatic blood flow by 30–50%. After any therapeutic procedure, patients with cirrhosis need stringent monitoring for the development of signs of hepatic decompensation, including encephalopathy, coagulopathy, ascites, worsening jaundice and renal dysfunction. When any of these adverse indicators are noted, prompt supportive therapy should be started.

Post-polypectomy bleeding (PPB) is the most commonly encountered complication in polypectomy. Several studies have demonstrated that the incidence of delayed PPB ranges between 0.4% to 10.1% in normal individuals, however, the risk of PPB in liver cirrhosis is not known. Delayed PPB can turn more serious clinically because the volume of blood loss is much more significant than that in immediate PPB, and appropriate treatment may be delayed. Therefore, delayed PPB is a serious complication that usually requires urgent hospitalization, transfusion, and repeat endoscopy.

Some colonic polyps create distinct challenges that call for the utilisation of approaches other than the conventional polypectomy techniques. Techniques like injection of saline /epinephrine (1:10 000) into the base of the polyp helps in controlling bleeding during the procedure as injecting these large stalks before snare polypectomy may provide prophylactic hemostasis and reduce the risk of a post-polypectomy bleed. Epinephrine is a potent vasoconstrictor, and both saline and epinephrine can exert a tamponade effect on blood vessels as the injected fluid also acts as a safety cushion increasing the distance between the mucosa and the muscle layer and serosa. Alternative options for prevention of post-polypectomy bleed include the placement of endoloop. The endoloop is a detachable oval-shaped nylon snare deployed in the same way as a standard snare around the stalk or base of the polyp prior to polypectomy. Paspatis et al found that the combination of epinephrine injection with placement of the endoloop was associated with only 1% rate of delayed bleeding whereas epinephrine use alone was associated with 11% rate of delayed bleeding. However certain problems with endoloops such as slipping off the polyp stalk, inadequate tightening, and persistence of bleeding despite endoloop placement were described in a retrospective study by Matsushita et al.

Another rare and interesting fact in our patient is that the polyp histopathology confirmed colitis cystica profunda which is a benign and inflammatory condition. She presented with bleeding per rectum and severe colicky pain due to intussusception and partial luminal narrowing by the polyp which is not a common presentation of inflammatory polyp. Colitis cystica profunda is a benign disease characterized by mucin filled cysts beneath the muscularis mucosa. The importance lies in differentiating this entity from mucus-secreting adenocarcinoma. It can present in a localized form, as a polyposid lesion, or as a diffuse process. Both the forms occur in the setting of acquired conditions resulting in mucosal ulceration and inflammation. The localized form is commonly associated with solitary rectal ulcer syndrome (SRUS).
whereas diffuse types are seen in ulcerative colitis, Crohn’s disease, radiation colitis, infectious colitis and so on. Solitary rectal ulcer syndrome (SRUS) is a rare disorder that has a wide spectrum of clinical presentation and variable endoscopic findings. This wide spectrum of clinical features, endoscopic findings, and histological features make SRUS a great mimicker of other serious conditions, including adenocarcinoma, inflammatory bowel disease, dysplasia, and adenomatous polyp. Endoscopically, mucosal prolapse syndrome (SRUS) appears as multiple ulcers, patchy erythematous mucosa or as a polypoid lesion. The macroscopic appearance of SRUS is described as ulcerative (55%), polypoid (24%) flat (21%). Endoscopically, the polyps are well-circumscribed, hyperemic masses with striking contrast to the normal appearing adjacent mucosal lining. Colonoscopic findings are important for the diagnosis of SRUS. Tjandra et al reported that 29% of their series had ulcers and 44% presented with polyps. Series by Torres et al etc reported that 65.3% of SRUS have ulceration. In contrast, Tendler et al reported that all of his 15 patients had polypoid lesions. Based on these findings, it is obvious that all kinds of rectal lesions can be expected in patients with SRUS, from mild erythema of the mucosa to a solitary ulcer, multiple ulcers, and polyps. Thus, it is obvious that the designation ‘solitary ulcer’ is a misleading. Clinicians should be aware of this fact and, in the right clinical setting, should consider SRUS in the differential diagnoses of all kinds of rectal lesions. To the best of our knowledge this unique presentation in a cirrhotic patient has not been reported before and ours is the first of its kind presenting with simultaneous variceal bleed and bleeding from polyp secondary to solitary rectal ulcer.

**CONCLUSION**

Cirrhosis by itself is not a contraindication for colonoscopic polypectomy. Nevertheless, cirrhotic patients with Child Pugh class B and C have a greater risk of Post-polypectomy bleeding (PPB). With advances in endoscopic tools such as endoclips and endoloops, it has become safer to perform endoscopic resection of large polyps even in high risk cases. Since clinically delayed PPB can be more serious because the volume of blood loss is much more than that in immediate PPB, endoscopists should be cautious of this entity and patients have to be closely followed up even after discharge to avoid complications.

**REFERENCES**


Spontaneous Intracranial Hypotension: An Interesting Cause of Intractable Headache

Kiran Kumar¹, Himanshi Singh²*, Rifah Anwar Assadi², Sameh Saied³, Mohammed Hamdy Ibrahim⁴, Mohammed Khalid¹, Shaikh Altaf Basha¹

¹Department of Internal Medicine, ²MBBS Students, ³Department of Radiology, ⁴Department of Neurology, GMC Hospital and Research Centre, Ajman, UAE

*Presenting Author

ABSTRACT

Intracranial hypotension (ICH) is a benign syndrome which is often under-diagnosed. It is characterized by orthostatic headache which is predominantly occipital. ICH is diagnosed in the presence of a typical history and characteristic imaging findings. Further confirmation by Lumbar Puncture to document low CSF pressure is necessary in some cases. Treatment is mainly conservative. However, surgical intervention might be required if conservative measures fail. In this report we present a case of 42 year old male patient who presented with symptoms of orthostatic occipital headache of three months duration and was subsequently diagnosed with Intracranial Hypotension based of characteristic MRI findings.

Keywords: Intracranial hypotension, Headache
INTRODUCTION

Intracranial hypotension is a rare condition characterized by orthostatic headache which relieves with supine position. It is due to reduced CSF volume/pressure occurring as result of CSF leakage; either primary/spontaneous or secondary due to lumbar puncture, trauma or surgery. The symptoms are mainly headache which is worse in standing position. Diagnosis is based on characteristic pachymeningeal enhancement on Gadolinium Enhanced MRI of the Brain. Lumbar puncture might be necessary in certain patients.

CASE REPORT

A 42 year male from Afghanistan, presented to our out-patient department with compliant of occipital headache of three months duration. Headache was severe and used to become worse on standing and walking, and was relieved on lying down. There was no history of any fever, nausea or vomiting, visual blurring or any focal neurologic deficits. Patient also denies any nasal discharge or blockage. There was no history of previous surgical procedure, lumbar puncture or trauma. On examination, blood pressure was 130/80 millimeters of mercury, pulse rate was 80 beats per minute, respiratory rate was 16 per minute, axillary temperature was 36.5 degrees centigrade and oxygen saturation was 99 % on room air. Patient was alert and oriented to time, place and person. There were no cranial nerve abnormalities. Motor and sensory system examination was unremarkable. There was no neck stiffness. Romberg sign was negative and gait of the patient was normal. Fundoscopic examination did not show any abnormality. Patient has been on Tab Paracetamol, two tablets four times a day since the past three months. His headache however, remained the same without any sustained improvement.

MRI of brain showed sagging of the midbrain, pachymeningeal thickening both supratentorial and infratentorial, enhancement and engorgement of the dural venous sinuses. (Figure 1 a, b & c).
Based on the clinical features and MRI findings a diagnosis of Intra Cranial Hypotension was considered. Patient was managed with bed rest, intravenous hydration and analgesics. Patient had partial symptomatic relief with conservative management. A need for further evaluation with diagnostic lumbar puncture for cerebrospinal fluid pressure testing and possibly a surgical intervention with epidural blood patch (if symptoms persisted) was discussed with the patient. Patient however, did not agree for either lumbar puncture or any surgical intervention and remained on conservative measures. Patient symptoms improved remarkably on conservative treatment and he is on regular follow up.

Figure 1. MRI of the brain before and after IV Gd-DTPA injection.
(a & b) Post contrast axial and coronal T1 Weighted Images with fat suppression showing diffuse pachymeningeal thickening and enhancement and engorgement of the dural venous sinuses (arrows in b).  
(c) Sagittal T2 Weighted Image showing sagging of the midbrain (Solid Arrow).

Based on the clinical features and MRI findings a diagnosis of Intra Cranial Hypotension was considered. Patient was managed with bed rest, intravenous hydration and analgesics. Patient had partial symptomatic relief with conservative management. A need for further evaluation with diagnostic lumbar puncture for cerebrospinal fluid pressure testing and possibly a surgical intervention with epidural blood patch (if symptoms persisted) was discussed with the patient. Patient however, did not agree for either lumbar puncture or any surgical intervention and remained on conservative measures. Patient symptoms improved remarkably on conservative treatment and he is on regular follow up.

DISCUSSION

Intracranial hypotension (ICH) is generally a benign syndrome and is often under-diagnosed. It is characterized by an orthostatic headache (headache worse at erect posture) and low cerebrospinal volume/pressure. The estimated incidence of spontaneous intracranial hypotension is 5 per 100,000 per year, with a peak age of around 40 years and females are affected thrice as men. Hypo-secretion, hyper-absorption and leakage of CSF are the three different mechanisms causing reduction of CSF volume. Recent studies suggest that leakage of CSF is the main cause of ICH. Leakage may result from surgical procedures such as Dural puncture, spinal anesthesia, placement of ventricular peritoneal shunt, trauma or with connective tissue disorder such as Marfan syndrome and Ehlers Danlos Syndrome type 3,3. It may also result from various reformer exercises such as Pilates and Yoga when done incorrectly. On the basis of etiology ICH syndrome can be further classified into five categories: 1) primary/ spontaneous 2) post-operative 3) post-traumatic 4) post lumbar puncture and nerve sleeve tear following a fall on buttock 5) secondary to other systemic condition such as diabetic coma, uremia, dehydration, hyperpnoea, cerebral arteriosclerosis. Spontaneous CSF leakage is uncommon, usually occur at cervico-thoracic or upper lumbar spine level.

All patients with intracranial hypotension present with headache. Although there may be variation in location and nature of headache in patients, majority have headache which is postural. Headache may be at frontal or occipital region or can even...
be diffuse. Headache is worse at erect position and relieved in supine position. The nature of pain is severe, dull or throbbing and frequently aggravated by upright position, head-shaking, laughing, jugular venous compression, coughing, sneezing and valsalva. Headache is resistant to analgesic. It is often associated with symptoms like vertigo, nausea, vomiting, dizziness, anorexia, neck stiffness, horizontal diplopia, hearing changes, galactorrhea, facial numbness, upper limb radicular symptoms; most of these symptoms are orthostatic in nature. Our patient had the characteristic orthostatic headache which was resistant to analgesic. He however did not have any other associated symptoms such as nausea/vomiting or visual abnormalities.

Diagnosis of ICH is made by lumbar puncture, showing decrease in intracranial pressure often less than 60 mm of H2O. In cases of very low ICP, Valsalva maneuver or gentle aspiration with syringe may also be used to withdraw CSF. CSF analysis is often normal but it may show rise in protein concentration, lymphocytic pleocytosis, increased RBC count, which is due to diapedesis of RBC into the CSF due to mechanical disruption and xanthochromia.

Magnetic resonance imaging has revolutionized the diagnosis of ICH. The major abnormalities demonstrated on MR imaging studies in patients with ICH are diffuse thickening of the pachymeninges with Gadolinium enhancement, engorgement of venous sinuses, subdural fluid collections, enlargement of the pituitary gland, and downward displacement of the brain. Meningeal enhancement in ICH is thick, linear, without nodularity, and involves the pachymeninges of both the infra- and supratentorial compartments without evidence of involvement of the leptomeninges (no abnormal enhancement around the brainstem, within the sylvian fissures, or in the depth of cerebral sulci). Our patient had characteristic MRI findings of enhancement of pachymeninges and brainstem descent. Intracranial hypotension if not controlled early, it can lead to cortical vein thrombosis, hyperprolactinemia, subarachnoid hemorrhage, subdural hematoma, cranial nerve palsy.

ICH can be managed in most patients with conservative measures. This includes bed rest (Supine Position) to reduce CSF pressure at the site of leakage and therefore allowing healing of the underlying meningeal defects, hydration, analgesic and steroids (Corticosteroids and fludrocortisone). When conservative treatment fails, invasive procedure such as autologous epidural blood patch (EBP) or surgical closure should be considered. Spontaneous intracranial hypotension can be improved when patients are positioned to 20 degree of trendelenberg. Initial clinical trials have shown that administration of factor XIII promotes the repair of CSF leak sites resulting in improvement of orthostatic headache in patients who were resistant to conservative therapy.

Our patient presented with characteristic postural headache which was not relieved with multiple courses of analgesics. Patient had symptomatic relief with conservative treatment; strict bed rest and intravenous followed by oral hydration which was combined with Tab paracetamol/caffeine.

CONCLUSION

Intracranial Hypotension is a rare cause of headache. The characteristic orthostatic headache which relives with supine position should raise the suspicion of ICH. Although a rare condition, diagnosis can be easily established with typical history and specific MRI findings of pachymeningeal enhancement and brain stem descent. Lumbar Puncture although confirmatory is not required in all cases and sometimes can aggravate the headache.
REFERENCES

Recurrent Venous Thrombo-Embolism in a Young Adult Female: Case Report with Review of Literature

Ehab M. Esheiba¹, Ani Purushothaman²*

¹Department of Cardiology, ²Department of Intensive Care Unit, Gulf Medical College Hospital and Research Centre, Ajman, UAE

*Presenting Author

ABSTRACT

Venous thromboembolism (VTE), including both deep vein thrombosis (DVT) and pulmonary embolism (PE) is the third most common cardiovascular illness after acute coronary syndrome and stroke. VTE is a multi-causal disease that results from multiple interactions between genetic, acquired, and circumstantial risk factors.

A 31 year old female patient presented with acute DVT at six weeks of her second pregnancy. She was managed accordingly with low-molecular weight Heparin throughout pregnancy; however, she developed multiple DVTs during the peri-partum period, after discontinuing the treatment for one week. Thrombophilia screening revealed that she has two strong thrombophilic states: Factor V Leiden and Protein S deficiency, in addition to other circumstantial risk factors (Obesity and Dyslipidemia).

The combination of these two inherited diseases presents a challenge to the treating physician, especially during pregnancy. In this article, we discussed this clinical case and the management plan that was followed with her till the current time with a review of literature in the same context.

We believe that addressing VTE as a public health problem should take a multi-dimensional approach targeting the epidemiology of the disease with implementation of cost-effective preventive and therapeutic programs.

Keywords: Venous Thrombo-Embolism, Deep Vein Thrombosis, Pulmonary Embolism, Congenital Thrombophilia
INTRODUCTION

Venous thromboembolism (VTE) is a condition including deep vein thrombosis (DVT) and pulmonary embolism (PE). It remains a common cause of mortality and morbidity in hospitalized or bedridden patients, as well as in healthy individuals. It is the third most common cardiovascular disease after acute coronary syndrome and stroke. It has been estimated that 1 to 2 per 1,000 people are affected each year. Approximately 1 out of 20 people develop a DVT during their lifetime. Pulmonary embolism is considered third most common cause of hospital-related deaths and the most common preventable among them.

VTE is a multifactorial disease resulting from interactions between genetic, acquired, and circumstantial risk factors. Factor V Leiden leading to activated protein C-resistance is the most commonly occurring genetic risk factor for VTE. Inherited antithrombin, Protein C, and Protein S deficiencies are relatively rare.

Here we report the case of a young female patient who suffered from multiple thrombotic events due to combination of inherited mutation of Factor V Leiden and deficiency of protein S, which has been considered a rare combination.

CASE REPORT

A 31 year old Egyptian female, obese, nonsmoker, pregnant G2P1 with 6 weeks gestation, presented with left lower limb pain and swelling of 2 day duration. Her past history was not significant apart from a family history of deep vein thrombosis in mother. On clinical examination, her vital signs showed BP 124/88mmHg, PR 90/min, regular, SpO2 98%, weight 122.6kg. On local examination of left lower limb, there was mild swelling of the left calf muscle with tenderness. Urgent venous Doppler study of lower limbs showed acute deep venous thrombosis of left gastrocnemius vein. She was immediately started on a therapeutic dose of anticoagulation with low-molecular weight Heparin (LMWH) for 12 weeks along with elastic stockings. Her condition improved and a repeat venous Doppler 12 weeks later showed partially resolved thrombus in the left gastrocnemius vein.

While she was on LMW heparin during pregnancy, she underwent a thrombophilia screening which revealed the presence of two thrombophilias, firstly, a homozygous inherited Factor V Leiden mutation, detected by PCR DNA sequencing and secondly, a low protein S activity, determined by plasma clotting time-based assay. Other thrombophilia screen showed a normal protein C activity, normal antithrombin activity, normal homocysteine levels and negative antiphospholipid antibodies. Her echocardiography was found to be normal. She continued to be on LMWH till her delivery and a normal progression of pregnancy was noted during the antenatal visits to obstetrics department.

At term, the patient was in her home country and she underwent elective caesarean section owing to her risk status and delivered a healthy baby. On subsequent OPD visit, it was learnt that she had discontinued the anticoagulant for a little more than 1 week following which there was recurrence of DVT symptoms. At that time, venous Doppler had revealed a DVT in the proximal right lower limb involving the external iliac, common and superficial femoral veins. She then continued to be on oral anticoagulation (Warfarin) guided by INR monitoring. During her subsequent visits; she had been diagnosed as having mild mixed dyslipidaemia and vitamin D deficiency, for which appropriate treatment had been initiated.

After three months on oral anticoagulation therapy, a repeat venous Doppler showed progressive recanalization of the thrombosed right common and superficial femoral veins, popliteal vein and posterior tibial vein. Due to inadequate INR
monitoring, therapy with new oral anticoagulant (Rivaroxaban) was started. She was counselled regarding breast feeding and she opted for feeding her child with artificial formulas after consulting the pediatrician.

One month later, she developed some weight gain and on prolonged standing, she had recurrence of lower limb swelling with mild pain. Venous Doppler showed near complete recanalisation of right femoro-popliteal veins, therefore her symptoms were attributed to a post-thrombotic syndrome.

This patient had a recurrent unprovoked proximal venous thromboembolism, secondary to combined thrombophilia due to Factor V Leiden mutation and protein S deficiency.

**DISCUSSION**

The pathophysiology of thrombosis is composed of three main components, endothelial injury, venous stasis, and hypercoagulability (Virchow’s triad). Hypercoagulability caused by thrombophilic disorders, can be inherited or acquired.

Inherited thrombophilia has been identified in 30% of idiopathic VTE patients. Primary deficiencies of clotting inhibitors like antithrombin, protein C, and protein S have been associated with approximately 5-10% of all thrombotic events. The two most common hereditary thrombophilia are the factor V Leiden and prothrombin 20210 gene mutations.

Activated protein C (APC) is a natural anticoagulant which inactivates factor Va and factor VIIIa in the coagulation cascade. Factor V Leiden is a variant form of Factor V that cannot be inactivated by the APC, thereby causing hypercoagulability. It is the most common genetic risk factor for VTE, found in 20–25% of VTE patients, in 50% of familial VTE and in 60% of pregnancy associated VTE. The resistance to APC was discovered by Dahlback et al in 1993 and the molecular defect was identified as a point mutation in Factor V by Bertina et al in Leiden (Netherlands), one year later. The FV Leiden mutation has autosomal dominant inheritance in more than 90% of APC resistance cases with incomplete penetrance. Homozygous individuals have a relative risk of 80-fold compared to 7-fold in heterozygous for thrombosis. Also homozygous experience VTE at a younger age (31 vs. 44 years). Regarding ethnicity, Jody et al reported that FV Leiden occurred in 12–14% of the Arab nationalities, 3–15% of the European population and was extremely rare in African, Asian, and indigenous Australian populations.

Decreased levels or decreased function of protein S leads to reduced degradation of clotting factors and an increased propensity to venous thrombosis and it was found to be prevalent in 0.03-0.13% of the normal population. About 0.8–3% of VTE are considered to be due to protein S deficiency. VTE is its most common manifestation, though stroke, aortic and coronary thrombosis, and renal vein thrombosis have also been reported.

The combination of FV Leiden and protein S deficiency has been estimated to be ~0.004%. A few cases with this combination have been reported from 1995-1997. Marie-Anne et al in 1996, had commented that among cerebral venous thrombosis patients, factor V Leiden was almost always associated with other predisposing factors. Another study in 1998 by Mustafa et al had suggested that among protein C or protein S deficient VTE patients, an increased incidence of a second thrombophilic defect, particularly factor V Leiden was found. Ivaylo et al had reported in 1999 about a haemodialysis patient with recurrent A-V shunt thrombosis who was found to have a combination of APC resistance and acquired protein S deficiency.

Some researches demonstrated no correlation between APC resistance and protein S level, although Koeleman et al had reported a high prevalence of this combination. There could have been possible misdiagnosis of APC resistance as protein
S deficiency prior to discovery of APC resistance; nevertheless, this combination seems to be a very rare event\textsuperscript{43}.

Acquired causes of thrombophilia include protein S deficiency secondary to vitamin K deficiency or treatment with warfarin, pregnancy, systemic sex hormone therapy, liver disease and nephrotic syndrome, anti-phospholipid antibodies and certain chronic infections (for example Human Immuno-deficiency virus). During pregnancy, the protein S levels fall progressively\textsuperscript{25} predisposing to recurrent VTE and/or fetal loss in pregnancy\textsuperscript{44}. Also, acquired APC resistance (without FV Leiden) is another VTE risk factor and this is possibly due to high factor VIII levels or antiphospholipid antibodies\textsuperscript{45,46}. Antiphospholipid antibodies (cardiolipin or Lupus Anticoagulant antibodies) are present in 2\% of the population, and can also lead to a hypercoagulable state; however, these may be asymptomatic and could be detected in infections or administration of certain drugs like Hydralazine, Quinine or some antibiotics\textsuperscript{11}. Another acquired factor is the presence of high homocysteine level, which may be seen in 10\% of VTE patients can increase relative risk by 2- to 3-fold\textsuperscript{21,47}.

Genetic thrombophilia also interacts with environmental factors to increase VTE risk, for example, at least 50\% of VTE in FV Leiden patients are triggered by additional predisposing factors\textsuperscript{48}. The VTE risk increased with age with incidence being lower in the young and higher in the elderly\textsuperscript{2,49}. Obesity (BMI >30 kg/m\textsuperscript{2}) increased VTE risk by 2.5-fold\textsuperscript{50}. Another major risk factor was pregnancy, where trials have shown that during pregnancy and puerperium, FV mutation increased VTE risk by 8- to 52-fold, as compared with non-pregnant women without thrombophilia\textsuperscript{51,52}. Major surgeries were complicated by VTE in 13\%, suggesting an approximately 20-fold increase in risk\textsuperscript{53}. Our patient was pregnant and also had undergone elective caesarean section which might have added to the risks and predisposed to another VTE episode. Air travel in a thrombophilic patient increased VTE risk by 14- to 16-fold\textsuperscript{54,55}. In addition, a prior history of DVT still remains single most powerful risk marker, with an acute VTE incidence being 25\%;\textsuperscript{56,57} The recurrent episodes of VTE in our patient might be supported by this.
CONCLUSION

In our case, the patient had multiple thrombotic episodes due to a combination of two thrombogenic disorders. Patients risk profile included an inherited homozygous FV Leiden mutation, though protein S deficiency could have been an acquired condition rather than an inherited disorder, owing to her state of pregnancy. She also had other circumstantial risk factors favorable for VTE like obesity and previous history of DVT. Since she had undergone a surgery, the postoperative immobilization and her postpartum state could also have been additional risk factors for the DVT recurrences. Hypercholesterolemia also could have contributed to the vascular damage.

This proves that any suspected VTE patients should be assessed for all likely causes (genetic, acquired, circumstantial). The presence of one abnormality should not refrain us from searching for other underlying causes. The detection of such abnormalities has major consequences on the long-term prevention and management. The combination of FV Leiden and protein S deficiency in a pregnant female posed a challenge for the treating physician. Important concerns were regarding safety in pregnancy, further investigation for pulmonary embolism, termination of pregnancy, life-long anticoagulation therapy versus bleeding risks.

In at-risk population, prophylaxis is the most effective means to prevent DVT complications. Drugs which predispose to thrombosis (like combined oral contraceptives) should be avoided. Prophylactic anticoagulation should be started after bleeding risks assessment. Special consideration should be given to women who have unexplained recurrent pregnancy loss as future pregnancy outcomes can be improved by anticoagulant and antiplatelet therapy in underlying documented thrombophilia. Nutritional replacement of folic acid, B12, and B6 in at-risk patients, may play a role in hypercoagulability related to homocysteine. The place of screening for asymptomatic relatives of VTE patients continues to be under debate. It is essential to have informed consent of all concerned before any screening. Some argue that tests should be restricted to young women when they consider pregnancy or hormonal contraception as these are known risk factors.

The prognosis of hereditary thrombophilia will depend on early diagnosis, effective prophylaxis and effective management of any VTE. The prognosis of acquired thrombophilia largely depends on nature of underlying cause.

Therefore, VTE has to be recognized as a public health problem which can be tackled with a multi-dimensional approach towards the multicausal factors and implementing cost-effective preventive and treatment programs.

REFERENCES

27. Clinical guidelines for testing for heritable thrombophilia; British Committee for Standards in Haematology (January 2010).


Accessory Pancreatic Lobe with Gastric Duplication Cyst- A Rare Case of Recurrent Acute Pancreatitis

Sithara.K.Balagopal¹*, Mohamed Ahmed Nabil El Shobary¹, Arundeepp Arora², Sameh Saied³, Bharani Anand⁴

¹Department of Gastroenterology, ²Department of Radiology, ³Department of Radiology, ⁴Department of Pediatrics, GMC Hospital & Research Centre, Ajman, UAE

*Presenting Author

ABSTRACT

Introduction: Hereditary anomalies of the pancreas and the pancreatic duct is not uncommon and can pose a diagnostic challenge. Accessory pancreatic lobe (APL) is a very rare and curable congenital anomaly of the pancreas which can present as recurrent acute pancreatitis (RAP) and association of APL with a gastric duplication cyst is even rarer. To the best of our knowledge, there are only 18 cases reported so far in the world literature and therefore the aim of this article is to highlight the significance of recognising these conditions in clinical practice for avoiding misdiagnosis.

Case Discussion We present an interesting case of 28-year old lady who presented with severe abdominal pain with similar episodes in the past but never evaluated before. A possibility of recurrent acute pancreatitis (RAP) was considered, further confirmed on serum amylase, lipase and imaging. CT pancreatography (CTP) followed by MRCP showed an accessory lobe in the head region of pancreas with a separate pancreatic duct associated with a gastric duplication cyst. She was managed as recurrent acute pancreatitis with conservative measures and she improved.

Conclusion Prompt identification and understanding of the congenital anomalies related to pancreas and pancreatic duct is imperative as these represent correctable causes of RAP. Moreover, as in our case, the pancreas can have lobulated contours, simulating a pancreatic tumor/tumor deposit or lymphadenopathy. Therefore it is prudent to be aware of this condition to avoid misdiagnosis and to offer appropriate treatment.

Keywords: Accessory pancreatic lobe (APL), computed tomography of pancreas, pancreatography (CTP), Recurrent Acute pancreatitis (RAP) MRCP (Magnetic resonance cholangiopancreatography)
INTRODUCTION

A 28-year old lady from Philippines presented with complaints of severe intensity epigastric pain followed by vomiting of 2 days duration. She had similar pain episodes in the past starting at the age of 14 years but was never evaluated before. At presentation, she was tachycardic (HR-124 beats per minute), BP 90/70 mm of hg and had shallow respiration of 24/minute. Skin was warm and diaphoretic and abdominal examination revealed diffuse tenderness, guarding and hypoactive bowel sounds. Investigations revealed neutrophilic leucocytosis (TLC 12,400/mm3), serum Amylase levels >1500 IU/l and serum Lipase levels >45,000 IU/l (normal upto to 300 IU/l). Urgent USG abdomen done was noncontributary. Since she had pain abdomen starting in her childhood, further evaluation was done to establish and rule out the cause of recurrent acute pancreatitis. Lipid profile, calcium, phosphorus and ANA were all within normal range. Since she had no definite identifiable risk factors for RAP, (due to the absence of alcohol, gall stones, surgery, use of corticosteroids etc) possibility of congenital anomalies of pancreas/pancreatic duct was considered and was advised further evaluation. Imaging studies CT pancreatography followed by MRCP was done to confirm the diagnosis and to rule out congenital anomalies of the pancreas. Contrast enhanced CT abdomen confirmed features of acute pancreatitis with an accessory pancreatic lobe located anteroinferior to the head region of pancreas with a separate dilated and tortuous pancreatic duct and possibility of associated gastric duplication cyst. There were no signs of chronic pancreatitis on CT. (Fig 1,2) . For further delineation and confirmation, MRCP (Figure 3) was done which confirmed the presence of accessory lobe of pancreas and irregular dilated duct with calculi within. The accessory pancreatic lobe was seen associated with a gastric duplication cyst with isodense contents within. (Fig 4) Therefore, the diagnosis of recurrent acute pancreatitis with accessory pancreatic lobe and gastric duplication cyst, an extremely rare anomaly was offered and she was managed with nil per oral status, Ryles tube aspiration, fluid resuscitation, proton pump inhibitors and supportive measures. She remarkably improved and was discharged on the 4th day after admission. She is advised surgery for further management.

Figure 1. Axial contrast enhanced CT (A and B) showing accessory pancreatic lobe with a dilated duct (white arrows, A) located anteroinferior to the main pancreatic tissue. Acute interstitial pancreatitis is evident by the increased bulk of the main pancreatic tissue (black arrows, B) and ascites (arrowhead, B).
Figure 2. Coronal (A and B) and sagittal (C) reformatted CT images depicting the accessory pancreatic lobe with dilated duct (white arrows). Note the accessory lobe is contiguous with the main pancreatic tissue (black arrow, A). Gastric duplication cyst with isodense contents (*) in B is seen associated with the accessory lobe (white arrows, B). Sagittal CT image showing the accessory pancreatic lobe and the main pancreatic tissue (black arrowhead, C).

Figure 3. Coronal T2W image (A) showing the dilated duct of the accessory lobe (white arrows, A) with irregular contour and intramural signal void representing ductal calculus (white arrowheads, A). Note the duct further extends into the main pancreatic duct (black arrows, A). Axial T2W MRI (B) showing accessory duct (white arrows, B) and the gastric duplication cyst (*) in B.
DISCUSSION

Recurrent acute pancreatitis (RAP) is defined as more than two episodes of acute pancreatitis without any features of chronicity¹. The estimated prevalence is approximately 1 in 10,000 and the disease predominantly affects males in their forties². RAP has multiple causes, alcohol and cholelithiasis being the most common (followed by hypertriglyceridemia, biliary tract infection, congenital anomalies, duodenal obstruction, medications, and neoplasms). In 10% to 40% of patients with RAP, the cause is not identifiable and the diagnosis ‘idiopathic’ RAP (IRAP) is given³. Most of the patients of RAP are at heightened risk of having frequent episodes unless the offending cause/agent is eliminated and these patients often develop chronic pancreatitis in due course of time if not properly evaluated and treated. Frequent episodes of inflammation can progress and lead on to chronic pancreatitis based on “necrosis-fibrosis hypothesis” ³. Very often the recurrence is predictable and there is a window of opportunity to identify and treat the cause to reduce recurrence. Therefore, if the common identifiable risk factors are not present (alcohol, gall stones, metabolic causes, infections, drugs, surgery etc), these patients must be further evaluated to find out the aetiology. With the advent of newer noninvasive imaging modalities like MRCP, the structural congenital anomalies are recognized more frequently with good specificity and sensitivity. Varied spectrum of anomalies of the pancreas and the ductal system are routinely encountered during radiologic procedures. These anomalies can simulate various neoplastic, inflammatory and posttraumatic conditions. Anatomic variants commonly encountered include developmental anomalies (e.g., pancreas divisum, annular pancreas, ectopic pancreas, pancreatic agenesis, congenital pancreatic cysts etc. Also not uncommon are potential imaging pitfalls (uneven fat distribution, “pseudo masses” etc). All these create a real diagnostic challenge for the treating physician and the radiologist. Therefore knowledge and recognition of the pancreas and pancreatic duct developmental anomalies is important as these anomalies may be a correctable cause of RAP. Congenital anomalies are usually not
detected until adulthood and often detected as incidental findings. With the advent of newer imaging modalities, MRCP, and CT pancreatography these anomalies are recognized more frequently. The common congenital variations of the pancreas are pancreatic divisum, annular pancreas, pancreatic agenesis, ectopic pancreas etc. Accessory pancreatic lobe (APL) is an extremely rare congenital anomaly and is defined as an accessory lobe of pancreatic tissue that originates from the main pancreatic gland and contains an aberrant separate duct. There is very limited literature on this entity and so far only 18 cases have been reported in the world literature. RAP is the commonest (66%) clinical manifestation of this anomaly. The accessory lobe can vary in size, with a wide or narrow communication to the main pancreas. This anomaly may be associated with a gastric duplication cyst. The aberrant duct in such cases communicates with the main pancreatic duct and along with the duplication cyst. The cause of RAP is hypothesized to be due to the blockade of the pancreatic duct by viscous mucus plugs/biliary sludge. In our patient, she had an accessory pancreatic lobe with a separate duct with stones within associated with a gastric duplication cyst.

Duplication cysts of the GI tract are very rare and usually occur in ileum and ileocecal region, gastric duplication cysts are the rarest (3.8%). Majority of these cysts are associated with other congenital anomalies like ectopic pancreas, spina bifida etc. Abnormalities in the foregut development is postulated to be responsible for the development of this congenital anomaly. McLetchie et al has suggested a neuroenteric hypothesis where in traction on the pancreatic duct by a neuroenteric band causes traction diverticula and pancreatic abnormalities. Most of these developmental anomalies were diagnosed only preoperatively, nevertheless, with newer imaging modalities these are picked up preoperatively as in our case. Although ERCP is the gold standard for evaluating pancreatobiliary anomalies, this procedure is invasive and has increased complications in these patients. Though the presentation of the gastric duplication cyst has been with abdominal pain, nausea and vomiting, rare cases of complications in the form of peritonitis, malignancy is also reported. However in patients with accessory pancreatic lobe associated with a gastric duplication cyst, the cause of abdominal pain is usually from acute pancreatitis as in our case as confirmed on serum amylase and lipase levels. Management of gastric duplication cyst with accessory pancreatic lobe includes surgery and endoscopic drainage. However since there have been reports of malignant transformation of the duplication cyst, resection is performed and surgery was performed in most of the cases reported so far. The surgery done was the ligation of the accessory pancreatic lobe with transection at its origin along with the local excision of the gastric duplication cyst.

In conclusion hereditary anomalies pertaining to the pancreas and the pancreatic duct are clinically of great importance as it usually creates a diagnostic dilemma. Physicians and radiologists ought to be aware of these varied presentations to distinguish them from other pancreatic conditions. Accessory pancreatic lobe with gastric duplication cyst is an extremely rare cause of recurrent acute pancreatitis and prompt identification of these developmental anomalies helps in surgical planning and prevention of inadvertent ductal injury.

REFERENCES


The Relationship between Oral Self-care and Oral Hygiene among Diabetic Patients in Ajman, United Arab Emirates

Sura A. A., Prathibhaprasad, Salwa Abdel Zaher Mabrouk Ibrahim, Jayakumary Muttappallymyalil

1Oral medicine, 2Oral pathology, College of dentistry, Gulf Medical University, Ajman, UAE.  
3Department of Internal Medicine, GMC Hospital and Research Centre, Ajman, UAE.  
4Community Medicine, Gulf Medical University, Ajman, UAE.

*Presenting Author

ABSTRACT

Objectives: The study looks into the relation of oral hygiene measures implemented by the diabetes patients and the presence of debris, calculus and gingivitis.  
Material and Methods: The study was conducted among 404 diabetic patients. All patients were confirmed diabetics for which they were being treated. After a written consent and completing a demographic questionnaire, an oral examination was done by the doctors to record the oral Hygiene status (the presence of debris, calculus and gingivitis) via the criteria of the gingival index by (Loe H.), for the gingival inflammation. The criteria used to score the oral debris and calculus indexes by (Green and Vermillion).  
Results: the majority of diabetic patient (86.0%) was with oral hygiene problems. 49.2% were using the brushing as the self-oral hygiene measure, 29%were using all methods. Only 29.2% of all the patients were free from gingivitis, debris and calculus. Supra gingival calculus, alone or along with gingivitis and debris was the less frequent finding. Whereas the debris was the highest frequent finding.  
Conclusion: As oral health is integral with general health, diabetes exaggerates the response of the periodontal tissues to the presence of debris and calculus. Good oral hygiene behavior, including brushing, flossing and using mouthwash, is important self-care measures and apart from regular dental office visits and motivation for this group of patients. It should be done in proper technique and adequate frequency.  
Keywords: Oral self-care measures, gingival index, oral debris index, calculus index, flossing.
INTRODUCTION

United Arab Emirates a rising country in the Middle East region is the financial hub connecting east and west. According to a report, there were 803,900 cases of diabetes in UAE in 2014\textsuperscript{1}.

Due to the changing lifestyle habits of people, obesity, a major risk factor for diabetes is on the rise globally and is responsible for the increasing incidence of the health crisis. According to the World Health Organization, nearly 30\% of the population globally is either overweight or obese. As per World health organization estimate of prevalence of obesity in men and women aged over 18 years in UAE was 64.6 in 2010 and has risen to 72.0 in 2014\textsuperscript{2}.

Periodontal disease is regarded as one of the important complications of diabetes by Eun-Kyong Kim et al and that periodontitis is preventable with adequate oral hygiene practice\textsuperscript{3}.

There are several reasons behind choosing the Greene and Vermillion calculus index and the oral debris index: no need for the use of disclosing agent, widely used in global clinical trials and national health surveys, with objective criteria thus easy to apply and is reproducible\textsuperscript{4}.

Thus Good oral health care at home has a major role. The study looks into the relation of oral hygiene measures implemented by the diabetes patients and the presence of debris, calculus and gingivitis.

MATERIALS AND METHODS

Patients were selected from the Internal Medicine department in GMC Hospital, Ajman. Ethics Committee and Research Committee of Gulf medical University, UAE approval was sought before the study began. 404 diabetic patients were taken as a sample.

SAMPLE SIZE CALCULATION

For this cross sectional study the sample size was estimated based on the assumption that the prevalence of Oral Manifestations in diabetes mellitus is 50\%.

\[
\text{Sample size} = \frac{4pq}{L^2}
\]

Where, \(p = 0.05\) (prevalence assumed as 50\%)

Thus, the sample size required for the current study is 400.

All patients were confirmed diabetics for which they were being treated. Patients signed an informed and written consent and completed a questionnaire, followed by oral examination done by the doctors using sterile disposable dental instruments kit for examination. They recorded the oral Hygiene status (the presence of debris, calculus and gingivitis) via the criteria of the gingival index by Loe H\textsuperscript{5,6} for the gingival inflammation. The criteria used to score the oral debris and calculus indexes by Green and Vermillion\textsuperscript{4}.

Data were entered on an Excel spreadsheet and statistical analysis was undertaken using SPSS version 21.

RESULTS

A total 404 subjects with Diabetes Mellitus with age ranged from 16-79 years. Majority (42.4\%) of the subjects were in the age group 46-60 years, 61.1\% were males and 38.9\% were females. In regards to diabetes type, 91.4\% of the subjects were diagnosed as having type II Diabetes. 32.1\% of the subjects were firstly diagnosed at age over 40 years. In regard to diabetes duration, 76.3\% of the patients had diabetes history less than 5 years, on the other hand only 5.3\% of the subjects had more than 16 years diabetes history.

Out of 404 patients, data of debris, calculus and gingivitis and oral hygiene habits were missing in 10 patients with Diabetes mellitus.
Table 1 shows oral hygiene methods used by diabetic patients. 49.2% of patients followed brushing as their main oral hygiene measure followed by flossing (1.8%). Some of them followed a combination of 16.8% followed up brushing with flossing their interproximal areas, whereas 2.5% followed up brushing with rinsing a mouthwash. 29.4% of the patients used all the methods.

Table 1: Distribution of Participants’ oral hygiene methods (N=404)

<table>
<thead>
<tr>
<th>Oral Hygiene Methods</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brushing</td>
<td>194</td>
<td>49.2</td>
</tr>
<tr>
<td>Flossing</td>
<td>7</td>
<td>1.8</td>
</tr>
<tr>
<td>Mouth wash</td>
<td>1</td>
<td>0.3</td>
</tr>
<tr>
<td>Brushing &amp; Flossing</td>
<td>66</td>
<td>16.8</td>
</tr>
<tr>
<td>Brushing &amp; Mouthwash</td>
<td>10</td>
<td>2.5</td>
</tr>
<tr>
<td>All methods</td>
<td>116</td>
<td>29.4</td>
</tr>
<tr>
<td>Total</td>
<td>394</td>
<td></td>
</tr>
</tbody>
</table>

*(Missing – 10)*

Of all the sample, 86% had a positive presence of debris/gingivitis/calculus in their oral cavity, table 2a. Among them 3.5% showed debris, 4.4% gingivitis and 4.9% showed presence of calculus. 23.3% showed debris with the presence of gingivitis. Debris and calculus were seen together in 6.7% of cases. Gingivitis in the presence of calculus was seen in 8.7% of patients, table 2b.

Table 2a: Presence of oral hygiene problems among DM Patients (N=404)

<table>
<thead>
<tr>
<th>Presence of Oral hygiene problems</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>56</td>
<td>14.0</td>
</tr>
<tr>
<td>Yes</td>
<td>344</td>
<td>86.0</td>
</tr>
<tr>
<td>Total</td>
<td>400</td>
<td></td>
</tr>
</tbody>
</table>

*(Missing – 4)*

Table 2b: Distribution of oral hygiene problems among DM Patients (N=344)

<table>
<thead>
<tr>
<th>Specified Oral problems</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debris</td>
<td>12</td>
<td>3.5</td>
</tr>
<tr>
<td>Gingival inflammation</td>
<td>15</td>
<td>4.4</td>
</tr>
<tr>
<td>Calculus</td>
<td>17</td>
<td>4.9</td>
</tr>
<tr>
<td>Debris&amp; Gingival inflammation</td>
<td>80</td>
<td>23.3</td>
</tr>
<tr>
<td>Debris&amp; Calculus</td>
<td>23</td>
<td>6.7</td>
</tr>
<tr>
<td>Gingival inflammation &amp; Calculus</td>
<td>30</td>
<td>8.7</td>
</tr>
<tr>
<td>Debris, Gingival inflammation &amp; Calculus</td>
<td>167</td>
<td>48.5</td>
</tr>
<tr>
<td>Total</td>
<td>400</td>
<td></td>
</tr>
</tbody>
</table>

*(Missing – 4)*
Table 3 explains the relationship of oral hygiene measures and the presence of oral hygiene problems in diabetic patients. Among patients who used brushing as their main oral hygiene measure, 89.6% showed presence of oral hygiene problems. All patients who used flossing showed oral hygiene problems. 81.3% of patients who used combined oral self-cares showed oral hygiene problems.

Table 3: Comparison between use of oral hygiene methods and presence of oral hygiene problems

<table>
<thead>
<tr>
<th>Oral Hygiene Methods</th>
<th>Oral Hygiene Problems</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Brushing</td>
<td>173</td>
<td>89.6</td>
</tr>
<tr>
<td>Flossing</td>
<td>6</td>
<td>100.0</td>
</tr>
<tr>
<td>Combined use</td>
<td>156</td>
<td>81.3</td>
</tr>
</tbody>
</table>

Table 4 explains the presence of debris, calculus and gingivitis in patients with Diabetes Mellitus who follow different oral hygiene measures.

**Oral hygiene measures and presence of debris on teeth**
Among patients who used brushing, 23.4% did not show any debris. 56.8% showed debris in proximal area. 19.8% showed debris in the 1/3, 2/3 of the exposed tooth surface, and none showed a presence of debris more than 2/3 of exposed tooth surface.

None of the patients who flossed showed the absence of any debris. 66.7% showed debris in proximal area. 33.3% showed debris in 1/3, 2/3 of exposed tooth surface and none showed a presence of debris more than 2/3 of exposed tooth surface.

In our sample, 36.6% of patients who used combined oral hygiene measures did not show any debris. 46.6% showed debris in proximal area. 15.7% showed debris in 1/3, 2/3 of exposed tooth surface, and 1% showed a presence of debris more than 2/3 of exposed tooth surface.

**Oral hygiene measures and presence of gingival inflammation**
18.8% of patients who brushed did not show any gingival inflammation. 62.5% showed mild-moderate gingival inflammation. 17.7% of people who brushed showed moderate to severe gingival inflammation and 1% showed severe gingival inflammation with redness, swelling and bleeding.

16.7% of patients who flossed did not show any gingival inflammation. 50% showed mild-moderate gingival inflammation. 33.3% of people who flossed showed moderate to severe gingival inflammation and none showed severe gingival inflammation with redness, swelling and bleeding.

36.5% of patients who used combined oral hygiene measures did not show any gingival inflammation. 41.7% showed mild-moderate gingival inflammation. 21.4% of patients who used combined oral hygiene measures showed moderate to severe gingival inflammation and 0.5% showed severe gingival inflammation with redness, swelling and bleeding.

**Oral hygiene measures and presence of calculus**
38.7% of patients who brushed did not show any dental calculus. 45% showed supragingival calculus. 15.2% of people who brushed showed moderate supragingival calculus and 1% showed abundant presence of supragingival calculus.
66.7% of patients who flossed did not show any dental calculus. 33.3% showed supra-gingival calculus. None of people who flossed showed moderate/abundant presence of supra-gingival calculus. 39.6% of patients who used combined oral hygiene measures did not show any dental calculus. 34.4% showed supra-gingival calculus. 26% of people who used combined oral hygiene measures showed moderate supra-gingival calculus and none showed abundant presence of supra-gingival calculus.

Table 4: Distribution of oral hygiene problems among DM Patients who follow different oral hygiene habits.

<table>
<thead>
<tr>
<th>Oral Problems</th>
<th>Groups</th>
<th>Oral Hygiene Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Brushing No.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>%</td>
</tr>
<tr>
<td>Debris</td>
<td>No dental debris</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>Debris in proximal area</td>
<td>109</td>
</tr>
<tr>
<td></td>
<td>1/3 - 2/3 of exposed surface of</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>tooth</td>
<td></td>
</tr>
<tr>
<td></td>
<td>more than 2/3 of exposed surface</td>
<td></td>
</tr>
<tr>
<td></td>
<td>of tooth</td>
<td></td>
</tr>
<tr>
<td>Gingival</td>
<td>No inflammation</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>Mild to moderate inflammation</td>
<td>120</td>
</tr>
<tr>
<td></td>
<td>Mild to moderate, severe</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>gingivitis</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Severe gingivitis, redness,</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>swelling, bleed</td>
<td></td>
</tr>
<tr>
<td>Calculus</td>
<td>No calculus</td>
<td>74</td>
</tr>
<tr>
<td></td>
<td>Supra gingival calculus</td>
<td>86</td>
</tr>
<tr>
<td></td>
<td>Moderate amount of Supra-</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>gingival calculus</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Abundance of supra- gingival</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>calculus</td>
<td></td>
</tr>
</tbody>
</table>

**DISCUSSION**

Diabetes mellitus is manifested as hyper glycaemia resulting from a defective insulin secretion/action/both. A group of disorders are commonly associated with it. Periodontal disease is one such association of diabetes\(^7\).

Individuals show different degrees of severity of periodontal disease and it happens to be more severe in people with diabetes when compared to non-diabetics and especially in patients with poorly controlled diabetes\(^8\). On the other hand, a well-controlled diabetic patient is considered as healthy dental patient. Given the fact that there are other severe complications of diabetes, patient’s last concern is their oral problems\(^9\). Cost is another major factor which prevents them from going to a dentist\(^10\).

As oral health is integral with general health, diabetes exaggerates the response of the periodontal tissues to the presence of debris and calculus. On the other hand, bacteremia induced by periodontitis cause elevated serum pro-inflammatory cytokines, leading to hyperlipidemia, and ultimately causing an insulin-resistance syndrome and contributing to destruction of pancreatic beta cells\(^11\). Thus treating chronic periodontal infections become essential for managing diabetes\(^12\).

Good oral hygiene behavior, including brushing, flossing and using mouthwash, is important self-care measures and apart from regular dental office visit and
motivation for this group of patients. According to Karikoski A. et al study of 420 systematically selected adults with diabetes, twice-daily tooth brushing is less common in diabetic patients than in non-diabetic patients and the main reason for the last dental visit was an emergency among almost one-fifth of those surveyed\textsuperscript{13}. In our study 49.2 % of patients followed brushing as their main oral hygiene measure followed by flossing (1.8%). Some of them followed a combination of 16.8 % followed up brushing with flossing their interproximal areas whereas 2.5 % followed up brushing with rinsing a mouthwash.

Among patients who used brushing as their main oral hygiene measure, 89.6% showed presence of oral hygiene problems. This could be attributed to the imperfect brushing technique or even inadequate frequency of teeth brushing. Debris was of a high percentage in proximal areas, in which brushing is insufficient to remove it, and that the majority of this group of patients were having mild gingival inflammation.

The majority of diabetic patients had no calculus that could be attributed to the oral self-care measures followed by the diabetic patients, though not all of them were followed and may be not in a proper technique. But it is sufficient to prevent the debris retention and hence the calculus formation.

All patients who used flossing showed oral hygiene problems as it was just one patient who used flossing. It is not a significant finding.

81.3% of patients who used combined oral self-care showed oral hygiene problems which could be attributed to the amplified reaction gingival response of the diabetic patient to the presence of the debris, or the patients could be poorly controlled.

There was a definite association between good oral hygiene measures and absence of any oral hygiene problems, and that the use of combined oral self-care measures together with optimal diabetes control result in better oral hygiene. Dentists should be able to identify the underlying condition, explain the integration to the patients, motivate and treat them appropriately.

REFERENCES
A Case Report: Management of Drug Induced Gingival Enlargement in a Kidney Transplant Patient

Aparna Pandey
Department of Super Specialty Dental Center, Gulf Medical Hospital and Research Center, Ajman, UAE

ABSTRACT

Gingival enlargement is a common manifestation of numerous underlying gingival and periodontal diseases. It is a known side effect of certain medications given for non-dental conditions. It has been documented with three main groups of drugs like calcium channel blockers (CCBs), immunosuppressants and anticonvulsants. The enlargement is more exaggerated in patients who take a combination of these drugs. Gingival enlargement becomes a major esthetic concern for the patients and interferes in their occlusion and function. It plays significant role in providing new niches for periodontopathogenic microorganisms. The pathogenesis of enlargement is attributed to be multifactorial. The management of gingival enlargement may require both nonsurgical and surgical approaches. Hereby, reporting a case of gingival enlargement in a patient with history of kidney transplant. He was on long term usage of immunosuppressants and CCBs (Nifedipine). The management involved the initial therapy followed by surgical phase. The surgical technique followed was gingivectomy based on his clinical and radiographic findings. The patient was monitored on scheduled maintenance visits.

Keywords: Drug induced gingival enlargement; phase I treatment; external bevel gingivectomy, Supportive periodontal therapy.
INTRODUCTION

Gingival enlargement is a common manifestation of numerous underlying gingival and periodontal diseases. It is a known side effect of certain medications given for non-dental conditions. It has been documented with three main groups of drugs like calcium channel blockers (CCBs), immunosuppressants and anticonvulsants. The enlargement is more exaggerated in patients who take a combination of these drugs. Gingival enlargement becomes a major esthetic concern for the patients and interferes in their occlusion and function. It plays significant role in providing new niches for periodontopathogenic microorganisms. The pathogenesis of enlargement is attributed to be multifactorial such as age, demographic variables, genetic predisposition, oral hygiene status, pharmacokinetic variables and molecular and cellular changes in gingival tissues. The management of gingival enlargement may require both nonsurgical and surgical approaches.

CASE REPORT

A 35-years-old male patient reported to the Super Specialty Dental Center, GMC Hospital, Ajman with a chief complaint of swelling in the gums, which had been progressively increasing over the previous 4 months. The patient’s medical history revealed that he had undergone kidney transplant 13 years back. He has been on multiple drug therapy since his transplant. Medication regimen followed was cyclosporine-A 100mg twice daily, Prednisolone 10mg once daily for initial 2 years then tapered it to 7.5mg then further to 5mg once daily for the last 8 to 9 years for immunosuppression. Nifedipine 10mg thrice daily and Atenolol 25mg (Aten) twice daily as antihypertensive drugs was prescribed to the patient. Patient mentioned that he had complains of swollen gums 7 to 8 years after the transplant surgery. Patient revealed that he has been undergoing surgical treatment for the swollen gums for the past 6 years, every 8 to 10 months in some other dental care centre. There was no mention of Phase IV or maintenance phase throughout his treatment and only a follow up for phase II or surgical treatment. Nevertheless, there was no need of Phase III or Restorative phase and hence was not considered in the treatment planning.

The intraoral examination revealed diffuse gingival enlargement covering almost entire crown of all the maxillary posterior teeth (Figures: 1, 2). Both maxillary centrals and laterals were not having any gingival enlargement. The entire palatal aspect was covered by gingival overgrowth bilaterally (Figure: 3). Mandibular arch displayed marginal papillary enlargement not involving attached gingiva. The degree of gingival enlargement was scored as Grade III for maxillary arch and Grade II for mandibular arch. The clinical appearance of gingiva was erythematous, bleeding on probing, loss of stippling with loss of gingival architecture in maxillary arch and shiny edematous surface. There was abundance of local factors especially around the gingival margins. On probing, there were pseudo pockets involving all the teeth with gingival overgrowth. The panoramic x-ray revealed mild horizontal bone loss (Figure: 4). Based on the clinical examination and medical history, a diagnosis of ‘drug induced gingival enlargement’ was made.
Treatment of drug-induced gingival overgrowth includes non-surgical and/or surgical therapies. Non-surgical treatment, where it is possible, is based on the
interruption, modification of the dosage or replacement of the drugs\textsuperscript{4}. However in this case, after a formal correspondence with the patient’s physician it was directed from him that no changes in the drug regimen could be made.

Phase I therapy involves the conventional scaling and root planning for removing the local factors and diseased cementum, wherever exposed. Following which, the oral hygiene instructions were given to patient and the use of chlorhexidine 0.2\% oral rinses twice daily along with other plaque control measures were emphasized. Patient was also demonstrated the use of water-pik all along the marginal gingival, which could not be maintained easily by other means. Hence, after completion of Phase I therapy, maintenance phase was observed for about 4 weeks. In the subsequent patient follow up, clinical examination showed that the inflammatory component of the gingival enlargement had reduced. There was slight bleeding on probing; the erythema, edema and surface shininess of the gingival tissues were diminished.

Nevertheless, three fourth of the clinical crown surface was still covered by the fibrotic enlargement of the gingival tissues. Hence, Phase II or Surgical phase was planned and the patient was informed accordingly. The various surgical options available for the management of gingival drug induced gingival overgrowth (DIGO) are – external bevel gingivectomy (EBG), apically displaced full thickness flap. The internal (reverse) bevel gingivectomy (IBG) often is used instead of an EBG if the tissue to be excised is thick and a long external bevel incision would be required to create knife-edged margins\textsuperscript{5}. As the patient’s panoramic x-ray did not show any requirement of osseous correction, the surgical option finalized was the classical surgical approach, the external bevel gingivectomy\textsuperscript{6}.

Pre-surgical routine hematological investigations revealed complete blood count within normal range. The bleeding (BT), clotting time (CT), Prothrombin time (PT), partial thromboplastin time (PTT) and INR were also normal. Patient physician was consulted regarding any modification of the patient routine drug regimen. There was no corticosteroid supplementation considered as the patient was taking less than 7.5mg of daily dose of prednisolone\textsuperscript{7}. The local anesthesia that is used for a patient who has had kidney transplantation is the same that is used for all patients (lidocaine, mepivacaine);\textsuperscript{8} the only difference is that, it does not contain adrenaline.

The treatment was planned in the morning session. The patient vitals were recorded before the beginning of the procedure. The extra-oral surface was scrubbed by betadine. The patient was asked to do pre-surgical mouth rinsing for 1min using chlorhexidine 0.2\% mouthwash. The surgery was performed quadrant wise per visit. The pockets were marked using pocket marker after adequate anesthesia was obtained. Kirkland knife and surgical blade#15 were used to place external bevel incision, simultaneous preserving the uninvolved attached gingival. The entire gingival architecture and papillary contour were restored and the surgical site was covered by periodontal dressing. Post-operative instructions were given to the patient. The first generation cephalosporins antibiotics were prescribed to the patient for 7 days post-operatively. The analgesic prescribed was acetaminophen. The follow up visits were planned at an interval of 7 to 10 days when the surgical site was reassessed and if healing was inadequate or the patient was complaining of discomfort the periodontal dressings were replaced for a week more. But this had to be done only after first quadrant surgery. Patient reported with uneventful healing after all surgical sessions. The patient was recalled every 1,3,6 months initially and during each recall visit the oral hygiene instructions were reinforced and scaling was performed. There was no gingival enlargement noticed in any quadrant (Figure5, 6, 7).
Figure 5: 3 years follow up maxillary right buccal view.

Figure 6: 3 years follow up maxillary left buccal view.

Figure 7: 3 years follow up palatal view.
However, the significance of the Phase IV or Supportive Periodontal Therapy (SPT) and home care regimen were emphasized and highlighted to the patient. The patient was also advised to use water pik, which exhibited considerable improvements in posterior areas. The patient has been on SPT since then and no recurrence of gingival enlargement is noticed. The treatment plan was based on the relevant patient history, clinical presentations and radiological findings. The pathogenesis of drug induced gingival enlargement.

**DISCUSSION**

Kimball in 1939 reported the first case of phenytoin induced gingival enlargement. The clinical manifestation of gingival overgrowth can range in severity from minor variations to complete coverage of the teeth, and that drifting of the teeth can occur, creating subsequent functional and aesthetic problems for the patient. The first time gingival overgrowth with cyclosporin therapy was described in the dental literature in 1983 by both Rateitschak-Pluss et al., and Wysocki et al. Cyclosporine induced gingival enlargement (incidence of approximately 30%) the deepening of periodontal pockets and associated subgingival microbiota may interfere with the progression of periodontal destruction and general health. Nifedipine appears to have an additive effect when used together with cyclosporine in transplant recipients with hypertension. It potentiates the adverse effects (i.e., gingival overgrowth) of cyclosporine.

The pathogenesis of DIGO has been attributed to multifactorial model. The role of plaque and associated periodontopathic pathogens is still controversial. Whether the plaque is causative or a result of compromised oral hygiene due to enlargement is still disputed issue. Despite these differences, all authors agree that removal of local irritants and reduction of gingival inflammation are important in the management of cyclosporin A-induced gingival enlargement. Therefore, the follow up visits intended for the patient were in 1, 3 and 6 months. During each visit the local factors i.e. plaque and calculus were removed using ultrasonics and hand instrument. The bleeding on probing was examined and the presence of psuedopockets was reassessed. Gingival tissue condition was reexamined. The overall examination was done for any new carious lesion. Oral hygiene instructions were reinforced.

**CONCLUSION**

In the present case, the patient was undergoing surgical management of the gingival enlargement every year and no SPT was considered. However, when patient reported to our center, after completion of the surgical treatment the importance of SPT was well explained and informed to the patient. Patient's home care oral hygiene protocol and recall visits every 3 months was considered an integral part of his treatment. Patient is under follow up from last 3 years without any gingival enlargement recurrence. Hence, with treatment options such as conventional surgical approach or LASERS to manage gingival enlargement the significance and gravity of Phase I and Phase IV SPT should not be overlooked and undermined.

**REFERENCES**

How Accurate can Electrocardiogram Predict Left Ventricular Diastolic Dysfunction?

Tamer T Taha¹,², Khaled Sayed², Mohamad Saad², Mohammed Samir²
¹Cardiology Department, Thumbyay Hospital Ajman, UAE
²Cardiology Department, Al-Minia University Hospital, Egypt
*Presenting Author

ABSTRACT

Heart failure continues to be a major challenge to healthcare; several resting and exercise electrocardiographic parameters have been investigated to predict the left ventricular diastolic dysfunction (LVDD). One hundred and forty patients, classified into 2 groups according to LVDD, were assessed by measurement of normal and corrected QT interval, T wave peak to T wave End and P wave dispersion in resting ECG. Exercise stress test looking for Hump sign (upward deflection of the ST-segment) was done. The relationships between these ECG parameters and LVDD were investigated. The study revealed significant occurrence of hump sign in patients with LVDD, there was a significant difference between both groups regarding QTc and P wave dispersion. P wave dispersion was significantly higher in patients with LVDD. Sensitivity and specificity of the ST hump sign in prediction of LVDD were 86% and 78% respectively. The study also concluded that P wave dispersion at cut off value of about 0.045 msec had the highest sensitivity (sensitivity 98%; specificity 64%) while QTc at cut off value of 0.395 msec had the highest specificity (sensitivity 81%, specificity 79%). P wave dispersion and hump sign had higher sensitivity while corrected QT interval had higher specificity in prediction of LVDD.

Keywords: Hump sign, diastolic dysfunction, QT interval, TpTe interval, P wave dispersion.
INTRODUCTION
Approximately half of the patients with heart failure (HF) have preserved ejection fraction (HFpEF). Recent studies have shown that the pathophysiology of HFpEF, initially believed to be principally due to diastolic dysfunction, is more complex. Appreciation of this complexity has shed new light onto how HFpEF patients might respond to traditional HF treatments, while also suggesting new applications for novel therapies and strategies.

While inherited long QT syndrome (LQTS) has historically been considered a purely electrical disease, echocardiographic studies over the past two decades have demonstrated a crude but replicable relationship between a prolonged QT interval and abnormal mechanical function.

P wave dispersion (PD) is one of the P-wave indices and it is calculated by subtracting the minimum P-wave duration from the maximum P-wave duration in any of the 12 ECG leads. It describes atrial conduction and not repolarization. It is related to the nonhomogeneous and interrupted conduction of sinus impulses intra and inter-atrially. Currently, PD is described as a non-invasive indicator of atrial fibrillation risk.

The interval between the peak of T wave and its end (TpTe) measures transmural dispersion of ventricular repolarization. Sauer et al., revealed a significant inverse linear association between the TpTe interval and tissue Doppler septal E0 velocity. This association persisted after adjustment for several important potential confounders, including age, QTc interval and left ventricular wall thickness.

The standard interpretation of the exercise stress test includes an evaluation of symptoms, exercise capacity, hemodynamic, and changes in ECG. Although ST depression and elevation are the most important ECG findings, a number of other parameters have been shown to be of diagnostic and prognostic value. Among these is a discrete upward deflection of the ST segment termed the ST hump sign (STHS).

Previous studies have shown that this sign represents atrial repolarization and leads to false positive exercise tests.

STHS has been associated with hypertension, which is characterized by myocardial hypertrophy, diastolic and systolic myocardial dysfunction, fibrosis, and limitation in sub endocardial flow reserve.

AIM OF THE STUDY
In this study, we aimed to study different parameters in resting and exercise stress test and evaluate whether they can predict left ventricular diastolic dysfunction (LVDD) diagnosed by Tissue Doppler Echocardiography.

MATERIALS AND METHODS
This prospective study was carried out in the department of cardiology, El-Minia University hospital during the period from November 2012 to November 2013. Four hundred eighty patients were referred for stress ECG for risk stratification of coronary artery disease. Out of these, 140 consecutive patients (96 males and 44 females) were included in this study by the following inclusion criteria: patients not known to have any history of ischemic heart disease, patients with negative exercise stress test, patients with positive exercise stress test and normal coronary angiography (False positive stress test), Normal resting ECG changes (No LBBB, RBBB or Wolf Parkinson White syndrome), Normal left ventricular systolic function, patients not receiving anti-arrhythmic drugs or any drugs that can affect QT interval.

Exclusion criteria included a true positive stress test.

The cohort of patients included 135 patients with true negative stress test and 5 patients (1 male and 4 females) with false positive stress test. The diagnosis of positive stress test was based upon the upward sloping ST segment depression more than one
and half small square. All patients satisfying the inclusion criteria underwent an echocardiographic estimation of the diastolic function of the left ventricle.

**Resting ECG**

1. QT interval: This is measured from the beginning of QRS complex to the end of T wave. QT interval should be measured in the longest interval present in ECG. We also used rate corrected QT or QTc which can be obtained by dividing the actual QT by the square root of RR interval.

2. P wave dispersion: This is calculated by subtracting the minimum P wave duration from the maximum P wave duration. P wave duration is calculated from the beginning of P wave deflection crossed isoelectrical line to the last P wave deflection crossed isoelectrical line.

3. TpTe interval: it is measured from the T wave peak to the T wave end in resting ECG and it represents transmural dispersion of repolarization.

**Treadmill exercise testing**

All patients performed exercise testing on an exercise stress test (GE Medical System, Milwaukee, WI). Exercise was terminated if there was severe angina, fatigue, dyspnea or severe arrhythmias. In the absence of symptoms, the test was terminated at the occurrence of 2 mm ST-segment depression or 1 mm ST-segment elevation, an increase in systolic blood pressure more than 230 mmHg or a decrease 20 mmHg or more or inability to exercise furthermore.

ST-segment hump sign was defined as a discrete upward deflection of the ST-segment found in any of the leads of the ECGs received during exercise. It was mostly observed in leads II, III, aVF, V1 to V6. Atrial repolarization is represented by a wave (Ta) with direction opposite to that of P wave that may extend up to ST-T forming hump sign and leading to ST-segment depression without presence of ischemia. As shown in Fig. 1, the combination of atrial (Ta wave) and ventricular (ST segment) electrical activity finally forms a depressed ST-segment. The proximal part of this depressed ST segment is a diphasic recording (in the cycle). The first phase of this diphasic recording is convex like a hump (same polarity/ axis with p wave) and we defined it as hump sign. “Hump sign” as defined in this study, is present in the proximal part of ST segment and not within or after the T wave.

A particular duration or magnitude is not required (these parameters were neither measured nor used as identifying criteria in the analysis).

The recognition of the hump sign was based entirely on a visual basis, using magnifying lens, and the investigators were blinded to the results of echocardiography and other patient characteristics.

![Figure 1: ECG showing the classical appearance of the ST hump sign](image-url)
Echocardiographic measurement
All patients included in our study underwent an echocardiographic study using conventional and Tissue Doppler Imaging (TDI) techniques to estimate the diastolic LV function. Imaging was performed in the left lateral decubitus position using a GE Vivid III expert machine (GE Medical Systems, Waukesha, WI), equipped with 2.5 MHz phase array transducer and Tissue-Doppler Imaging software. Trans-mitral left ventricular filling velocities at the tips of the mitral valve leaflets were obtained from the apical four chamber view using pulsed wave Doppler echocardiography. The trans-mitral left ventricular filling signal was traced manually, and the following variables were derived: peak velocity of early (E) and late (A) filling and E/A ratio.

A Doppler velocity range of _30 to 30 cm/s was selected using the lowest wall filter settings and the minimum optimal gain. Doppler tissue imaging velocities were recorded at a sweep speed of 100 mm/s and stored on S-VHS videotape for later playback and analysis. All measurements were made in 3 cardiac cycles and averaged. Cardiac cycles with extrasystolic, post-extrasystolic beats, or any rhythm disturbance were excluded.

The following measurements were made from the TDI recordings: early (E) and late (A) diastolic velocities and the deceleration time derived by linear extrapolation of Ea to baseline. The ratio of trans-mitral early LV filling velocity (E) to early diastolic Doppler tissue imaging velocity of the mitral annulus (transmitral E/E’) was calculated. This ratio has been reported to correlate with LV filling pressure. Echocardiographic analysis was performed by a single experienced investigator, who was blinded to the exercise ECG results. The ratio E/E’ was computed as the most reliable index of diastolic LV dysfunction. It is known that E/E’ has direct correlation with pulmonary capillary wedge pressure (PCWP) and can even be used to compute PCWP (PCWP =1.24 [E/ E’] + 1.9)\(^{11}\). Values of E/E’ = 8 or less under normal conventional Doppler E/A ratio (N1), in most circumstances, predict normal diastolic myocardial function with normal filling pressures, while values of E/E’ = 15 or more predict impaired diastolic myocardial function with increased filling pressures\(^5\).

Ethical approval
The study was ethically approved by the University’s research ethics committee that conforms to the Declaration of Helsinki. All patients provided a written consent prior to their enrolment in the study.

Statistical analysis
Statistical analysis was performed using SPSS statistical software, version 14.0 (SPSS, Chicago, IL). Sensitivity and specificity for the hump sign were also determined. Significance level was set at p ≤0.05.

RESULTS
This cohort of 140 patients was divided into 2 groups of patients according to the presence or absence of LV diastolic dysfunction: group A, including 56 (40%) patients who had no LV diastolic dysfunction, and group B, including 84 (60%) patients who had LV diastolic dysfunction. The different demographic features were compared between both groups. The demographic features of the study sample are displayed in Table 1. Five patients (1 male and 4 females) with false positive stress test (Normal Coronary Angiography and positive stress test) and 135 patients with true negative stress test were included in the study.
Table 1: Demographic features of the study populations.

<table>
<thead>
<tr>
<th></th>
<th>Group A (n=56)</th>
<th>Group A (n=84)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>44.6 ± 8.9</td>
<td>47.7 ± 7.8</td>
<td>NS (0.133)</td>
</tr>
<tr>
<td>Sex</td>
<td>M 38 (67.9%)</td>
<td>58 (69%)</td>
<td>NS (0.882)</td>
</tr>
<tr>
<td></td>
<td>F 18 (32.1%)</td>
<td>26 (31%)</td>
<td></td>
</tr>
<tr>
<td>Body mass index</td>
<td>23.6</td>
<td>21.9</td>
<td>NS (0.835)</td>
</tr>
<tr>
<td>Smoking</td>
<td>36 (69%)</td>
<td>46 (52%)</td>
<td>NS (0.627)</td>
</tr>
<tr>
<td>History of hypertension</td>
<td>20 (35.7%)</td>
<td>34 (40.5%)</td>
<td>NS (0.571)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>4 (7%)</td>
<td>8 (9%)</td>
<td>NS (0.752)</td>
</tr>
<tr>
<td>Hypercholesterolemia</td>
<td>6 (11%)</td>
<td>12 (14%)</td>
<td>NS (0.847)</td>
</tr>
</tbody>
</table>

NS: Not significant.

Resting ECG parameters and diastolic dysfunction
Comparing the resting ECG parameters between both patient groups, it was revealed that TpTe interval had no statistically significant difference between them, in contrast to QT interval, QTc and P wave dispersion which had a statistically significant difference as shown in Table 2.

Table 2: Comparing resting ECG parameters in patients with normal and impaired LV diastolic function.

<table>
<thead>
<tr>
<th></th>
<th>Group A (n=56)</th>
<th>Group B (n=84)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TPTE (Mean ± SD)</td>
<td>0.104 ± 0.019</td>
<td>0.1 ± 0.01</td>
<td>0.648</td>
</tr>
<tr>
<td>QT interval (Mean ± SD)</td>
<td>0.333 ± 0.026</td>
<td>0.347 ± 0.031</td>
<td>0.005</td>
</tr>
<tr>
<td>QTc (Mean)</td>
<td>0.388 ± 0.021</td>
<td>0.413 ± 0.021</td>
<td>&lt;0.0005*</td>
</tr>
<tr>
<td>P wave dispersion (Mean ± SD)</td>
<td>0.047 ± 0.010</td>
<td>0.069 ± 0.01</td>
<td>&lt;0.0005*</td>
</tr>
</tbody>
</table>

*Significant difference

Hump sign and diastolic dysfunction
The appearance of the ST hump sign at the peak of exercise testing was observed in 88 patients. In 28 patients, hump sign was present in leads II, III, and aVF; in 20 patients, it was noted in leads V4–V6 and in 40 patients, it was noted in leads II, III, aVFand V1–V6.

We did a correlation between presence of diastolic dysfunction and appearance of hump sign in treadmill test using Chi-square test. The “hump sign” occurred more frequently in patients with diastolic dysfunction than in patients with normal diastolic LV function. This difference reaches statistical significance on the T2 test. This is shown in Table 3. The “hump sign” was equally observed in patients with and patients without hypertensive history (44 patients each). Eight patients from hypertensive group had left ventricular hypertrophy in the echocardiography, but there was no significant correlation between presence of hypertrophy and development of hump sign in treadmill test in our study. Absence of left ventricular hypertrophy was significantly (p <0.001) more noted in patients without history of hypertension (42 patients) than patients with hypertensive history (10 patients).

Table 3: Distribution of hump sign occurrence in patients with normal and impaired diastolic LV function.

<table>
<thead>
<tr>
<th></th>
<th>Group A (n=56)</th>
<th>Group B (n=84)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hump sign:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Absent:</td>
<td>40 (71%)</td>
<td>12 (14%)</td>
<td>&lt;0.0005*</td>
</tr>
<tr>
<td>Present:</td>
<td>16 (29%)</td>
<td>72 (86%)</td>
<td></td>
</tr>
</tbody>
</table>

*Significant difference.
Bivariate correlation and multivariate analysis.
There was a strong correlation between each of the P wave dispersion ($R = 0.69$, $p < 0.0005$), QTc ($R = 0.472$, $p < 0.0005$), QT ($R = 0.312$, $p < 0.0005$) and the LV diastolic dysfunction. Similarly, there was a strong correlation between the ST-hump sign and the LV diastolic dysfunction ($R = 0.544$, $p < 0.0005$). These correlations were significant at the $p = 0.01$ level. The TpTe revealed no correlation ($TpTe, R = 0.043, p < 0.726$) with LV diastolic dysfunction. Multivariate analysis revealed that P wave dispersion has the strongest association with the LV diastolic dysfunction ($R = 0.733, R^2 = 0.538, p < 0.0005$).

Sensitivity and specificity for prediction of LV diastolic dysfunction
The sensitivity and specificity of the resting ECG parameters and the ST-hump sign for prediction of diastolic dysfunction are displayed in Table 4 and Fig. 2. Analysis of sensitivity and specificity of these ECG parameters for prediction of diastolic dysfunction showed that P wave dispersion at cut off value about 0.045 ms had the highest sensitivity (sensitivity 98% and specificity 64%) while QTc at cut off value 0.395 ms had the highest specificity (sensitivity 81% and specificity 79%).

Table 4: Cut off values, sensitivity and specificity of resting ECG parameters & hump sign for the prediction of diastolic dysfunction.

<table>
<thead>
<tr>
<th>ECG parameter</th>
<th>Cutoff value</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>QT</td>
<td>0.33</td>
<td>69%</td>
<td>64%</td>
<td>0.039</td>
</tr>
<tr>
<td>TPTE</td>
<td>0.095</td>
<td>76%</td>
<td>29%</td>
<td>0.634</td>
</tr>
<tr>
<td>QTc</td>
<td>0.395</td>
<td>81%</td>
<td>79%</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td>P wave dispersion</td>
<td>0.045</td>
<td>98%</td>
<td>64%</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td>Hump sign</td>
<td>NA</td>
<td>86%</td>
<td>78%</td>
<td>&lt;0.0005</td>
</tr>
</tbody>
</table>

NA: Not Applicable.

![ROC Curve](image)

Figure 2: ROC curve to determine sensitivity & specificity of resting ECG parameters for the prediction of diastolic dysfunction.
DISCUSSION

Our results also agree with Gunduz et al. who found no significant differences regarding age and sex in patients with and without diastolic dysfunction9. On the other hand, our results disagreed with the results of Namdar et al., regarding the relation between age and diastolic dysfunction but agreed with his results regarding the relation between sex and diastolic dysfunction12.

In this study we tried to assess some resting ECG parameters to see whether they correlate with the ST-hump sign in exercise ECG and also to evaluate whether these ECG parameters and the ST-hump sign can predict diastolic dysfunction13.

This prospective study included 140 patients who were referred for stress ECG for risk stratification of coronary artery disease. We found a significantly higher occurrence of the ST hump sign during exercise stress test in patients with LV diastolic dysfunction (p< 0.0005).

There was no significant difference regarding age and sex in between patients with and patients without LV diastolic dysfunction; this comes in agreement with Michaelides et al., who revealed a significant correlation between hump sign and diastolic dysfunction in a study that included 237 patients with normal resting electrocardiogram (ECG)13. These results also agree with another study which found significant correlation between hump sign and diastolic dysfunction in hypertensive patients5.

Our results match with the study of Liakos et al., who showed that the improvement of LV diastolic function during a 6-month treatment, leads to a significant reduction in the prevalence of hump sign and a parallel decrease in false-positive exercise stress test results, considering that hump sign is responsible for ischemic-appearing ST response14.

Lepeschkin et al., reported that the most plausible mechanism of hump sign is that diastolic dysfunction leads to an increase in the LV diastolic pressure which leads to an increase in the atrial “strain”, which finally leads to abnormal atrial repolarization causing accentuation and/or prolongation of the atrial T wave. This Ta wave combined with ventricular electrical activity forms the hump sign in the early portion of the ST segment15.

Our study revealed that there was no significant difference in TpTe while there was a significant difference between both groups regarding QT interval and a strong significant difference between them regarding the QTc and P wave dispersion.

Regarding only corrected QT interval, our results match the results of a study by Wilcox et al. and Namdar et al7,12.

Two other studies revealed a significant correlation between diastolic dysfunction and corrected QT interval16.

The study by Namdar et al included patients with hypertension and LV hypertrophy also found a modest correlation between the traditional Doppler parameters of diastolic dysfunction (E/A ratio and isovolumic relaxation time) and QTc12.

In our study we also concluded that there is no significant correlation between TpTe interval in resting ECG and diastolic dysfunction (p= 0.726). These results did not agree with the results of study of Sauer et al., but agreed with the results of Namdar et al14,12.

Multiple recent studies have demonstrated the role of T wave analysis, and TpTe in particular, as a potential ECG biomarker of dispersion of repolarization. In addition, some experiments have begun to investigate the ability of pharmacologically reversing dispersion of repolarization measured by TpTe as a potential therapeutic mechanism for reducing proarrhythmic substrate.

Nevertheless, transmural dispersion of repolarization has only recently been demonstrated as a potential mechanism contributing to mechanical dysfunction in patients with overt HF.5 P wave dispersion is related to the nonhomogeneous and
interrupted conduction of sinus impulses intra and inter-atrially. Currently, P wave dispersion is described as a noninvasive indicator of atrial fibrillation risk, which can be calculated easily on a 12-lead surface ECG. Dogan and colleagues compared hypertensive patients who had LV diastolic dysfunction (LVDD) with hypertensive patients who did not have LVDD and found P wave dispersion to be higher in LVDD patients. Our results showed that P wave dispersion was significantly higher in patients with LVDD and was significantly correlated to the diastolic dysfunction. Similarly, multivariate regression analysis revealed that P wave dispersion has the best correlation with diastolic dysfunction (R= 0.69, p value < 0.0005). Our results agree with previous studies done by Gunduz et al., Namdar et al., and Dae-Hyeok et al.

This significant correlation between p wave dispersion and diastolic dysfunction can be explained by the fact that left ventricular diastolic dysfunction in a hypertrophic or ischemic ventricle results in an increase in left ventricular end-diastolic (LVED) pressure and in left atrial dimensions. The increase in left atrial dimensions as a result of rising intra-atrial pressure changes the geometry of atrial fibrils; this, in combination with nonhomogeneous fibrosis of the left atrial wall, interrupts the conduction of sinus impulses.

To the best of our knowledge, no prior studies tried to evaluate ECG parameters for cut off values for prediction of diastolic dysfunction. In this study, we tried to define sensitivity and specificity of some resting ECG parameters as well as the hump sign in exercise stress test for the prediction of diastolic dysfunction. Our results revealed that the sensitivity and specificity of the ST hump sign in prediction of diastolic dysfunction were 86% and 78% respectively. We also concluded that P wave dispersion at cut off value about 0.045 ms had the highest sensitivity (sensitivity 98% and specificity 64%) while QTc at cut off value 0.395 ms had the highest specificity (sensitivity 81% and specificity 79%). These results suggest that resting ECG can be used as an easy bed-side tool for the prediction of diastolic dysfunction.

STUDY LIMITATIONS
Our study had some limitations. First, patients with ST hump sign but without echocardiographic criteria for diastolic dysfunction were not followed up. So, we were not able to monitor the possible future development of impaired ventricular function in these patients. Second, the ST hump sign is not a specific finding; as in our population, this sign was affected by the presence of arterial hypertension. The small number of our study patients did not allow any safe conclusion regarding the impact of risk factors on the appearance of this sign such as diabetes, hypercholesterolemia and the obesity. Third, the study population was relatively young, so the results of the study can’t be generalized to whole spectrum of ages.

CONCLUSION
Analysis of certain parameters in resting ECG especially QTc and P wave dispersion can help in prediction of diastolic dysfunction. Also, the appearance of a “hump” at the ST segment during exercise testing is associated with higher incidence of diastolic dysfunction. Therefore, its identification may be useful for stratification of these patients and may provide an additional indication for the close follow up and treatment of these patients.

CONFLICT OF INTEREST
The authors report no conflict of interest.
REFERENCES

Application of a Rapid Assay to Detect Targeted Numerical and Structural Anomalies in Patient with Congenital Malformations

Nimmakayalu M¹, Kumar M¹, Verghese R¹, Elbaaz Z¹, Sivakumar B¹, Edwin D’Souza I², Fasih Z² and Menon PK¹.

¹Genomics Laboratory, Center for Advanced Biomedical Research and Innovation, Gulf Medical University, Ajman, UAE
²Department of Pediatrics, GMC hospital and research center, Ajman, UAE
*Presenting Author

ABSTRACT

Bacterial artificial chromosomes (BACs)-on-Beads (BoBs) is one of the novel and rapid technologies that has been a part of recent advances in genomic technologies. BACs-on-Beads technology™ that assists in speedy detection of copy number changes (CNVs) in targeted genomic regions from minimal amount of DNA. We compared this molecular multiplex, bead-based suspension array that is used in prenatal invasive testing, with conventional cytogenetic and G-banded karyotype techniques. We present the initial BoBs analysis data of 4 patients referred to CABRI with congenital malformations. As per the manufacture’s information the targeted region covers at least 4-5 bacs for each region. The selected loci represent the relatively common chromosomal syndromes associated with deletions that can be missed by karyotype analysis. The syndromes are known with definable phenotype and deletion as the major means giving rise to the syndrome. In addition to this the BAC’s for the common aneuploidies of chromosomes 13, 18, 21, X, and Y are also present. The method not only detected the known trisomy 21 but also identified a deletion on the long arm of chromosome 7 at q11.2 region that represents the Williams – Beuran Syndrome (WBS) critical region in a patient with suspected trisomy 21. BoBs is potentially a very useful first row test for aneuploidy detection because of its lower cost and rapid detection with minimal amount of DNA especially in newborns with suspected congenital malformations. The results suggest that it is a reliable technique to detect common microdeletions that get missed out by conventional chromosomal analysis.

Keywords: Bacterial artificial chromosomes (BACs)-on-Beads, FISH, WBS critical region, Microarray.
INTRODUCTION

Birth defects are accountable for most cases of infant fatality and morbidity all over the world\(^1\,\,^2\), with 7% of all neonatal deaths due to congenital malformations\(^3\,\,^4\). It is estimated that six percent of these defects are due to aneuploidies and nearly one in 200 newborns is affected\(^2\,\,^4\).

The cause for congenital malformations is due to chromosomal aneuploidies or monogenic or due to environmental causes such as fetal infections, environmental teratogens, and could be by the low percentages for these factors or most of these defects are due to the combined effects of environmental and genetic factors\(^2\,\,^4\).

The quick success of results for prenatal testing was crucial in these disorders. The recognition that common aneuploidies could be analyzed quickly came from the use of fluorescence in situ hybridization (FISH) that was offered as clinical testing for aneuploidy FISH on uncultured cells\(^5\,\,^6\). The FISH testing uses probes that can identify aneuploidies and additional markers for particular chromosomes, but it is limited by its inability to detect abnormalities in chromosomal regions that are not included in the testing panel.

Although FISH can be performed on uncultured cells, chromosome analysis requires culturing to obtain metaphase chromosomes where resolution of the chromosome does not permit the identification of most microdeletion syndromes. The chromosome analysis can be helpful to detect aneuploidies and large structural rearrangements, but cannot identify most alterations smaller than 10 Mb in size\(^7\). Based on what is known, chromosome analysis is limited by resolution and FISH is limited to the regions represented by the probes in the testing panel. Introduction of microarrays has overcome these limitations in identifying cytogenetic anomalies in postnatal\(^7\) and prenatal testing in on-going and ended pregnancies\(^8\,\,^{12}\). The density of the probes has increased with the advancement of technology and array designs were based on targeted approach or genome wide with their own advantages and disadvantages.

A targeted approach has the advantages of detecting gains and losses of only those loci that have been well characterized. The disadvantage in this approach is that the regions of the genome that may have clinical relevance in an unbalanced state would go undetected. Increased coverage throughout the genome may allow the identification of additional clinically relevant imbalances but will also lead to the identification of gains or losses of unknown or unclear clinical significance \(^13\).

An assay was recently developed for pregnancies with a low risk of chromosome abnormalities (e.g. normal ultrasound examinations) that is broader than current FISH aneuploidy screening but without the possibility of unclear results that can be observed in microarray testing. It is a suspension array-based (Luminex Corp, Austin, TX, USA) assay, also known as BACs-on-Beads \(^6\). The Prenatal BobS kit used in the present study consists of selected syndromes that are relatively common among chromosomal disorders; the deletions can be missed, by chromosome analysis. The syndromes result in a known, definable phenotype or outcome that is relatively severe; the syndrome does not usually present with abnormal ultrasound findings; and deletion is the major mechanism giving rise to the syndrome. In addition to these criteria, the common aneuploidies of chromosomes 13, 18, 21, X, and Y were also included \(^6\). It has been used in several labs as an alternate to FISH in prenatal testing. Here we used this in our pilot study on the samples we obtained from the newborns referred with congenital malformations.
MATERIALS AND METHODS

Peripheral blood samples from 4 new born children diagnosed with congenital malformations (GMC hospital and research center) were submitted initially for chromosome analysis. DNA Extraction from EDTA Blood included several steps starting with blood lysis denaturation followed by deproteinization and DNA precipitation and re-suspension. The pellet was dissolved in 300µl of TE buffer, pH 7.5 at 55°C. Labeling of genomic DNA along with male and female reference DNA was performed that involved 60-90 min incubation in the thermo cycler at 37°C. It was followed by Purification of the labeled DNA sample that was transferred into NucleoFast 96 PCR purification plate that involved treatment with TE buffer and plated placed on incubator shaker followed by measurement of DNA concentration. The purified DNA which is adjusted to 150-200ng/µl was subjected to hybridization using hybridization bead mix provided by the manufacturer in the labeling kit. The procedure is followed by DNA washing and Reporter binding as per manufacturer protocol. Next the Assay Measurement was done using the Luminex instrument. The measurement data was analyzed using BoBs analysis software provided by Perkin Elemer.

RESULTS

We performed BOBs assay analysis on 4 patients referred with congenital malformations. We found one patient with a trisomy of chromosome 21 that was also chromosomally abnormal with trisomy 21 another patient that was chromosomally normal showed a deletion of the Williams –Beuran Syndrome critical region (WBSCR) on chromosome 7q11.2. Other two samples analyzed were normal. The samples are run along with the normal male and female references DNA (Figure 1). The deletion noticed was about 1.04Mb that included 5 selected BAC’s with co-ordinates of the deleted region range from 72,598,000 – 73,639,000 (Figure 2) as per the manufactures kit information which is about 1.04Mb of the 5.1 Mb of the WBSCR that includes several genes responsible for WBS. The important genes being CLIP2, ELN, GTF2I, GTF2IRD1 and LIMK1 are among the genes that are typically deleted in patients with William’s syndrome and the FISH testing is usually done to look for ELN gene deletion. Most of these genes are well characterized and the loss of the ELN gene is found in most of these patients with this disease.

DISCUSSION

Our pilot study using BoBs prenatal testing kit on 4 patients with congenital anomalies revealed loss of the WBSC region in patient 2a (Figure 3) with and another patient 3a with a gain of extra copy of chromosome 21(Figure 4). All the four patients were first analyzed chromosomally with patient 3a showing an extra copy of chromosome 21and rest of them were normal. The BoBs Prenatal kit used is usually dedicated to the prenatal samples like amniotic fluid or chorionic villi or products of conception. The loss of the WBS region (25 %) noticed in one of the 4 patients with the abnormality suggest that it is promising assay to study patients who appear chromosomally normal with congenital abnormalities.

The patient 2a with the deletion was born to a 38 yrs. old mother (G4P3) who is the fourth child. All the other 3 elderly children were normal. The patients 2a had coarse facial features, systolic murmur 3/6 echocardiography with large intact VSD 1.2 cm. The other features included periorbital edema with puffiness of the eyes, flattened
nasal bridge with small nose with upturned nose. The epicanthic folds and prominent nasolabial folds were present. The mouth was wide open with long prominent upper lip and small chin. The rubella IgG-19.7 IU/ml (> 10 reactive) and the neonatal screening profile were normal so as chromosome analysis showing 46, XX karyotype. The BoBs assay picked a deletion of the WBSC region but full size of the deletion may not be represented as the assay will detect only copy gain or loss within the regions represented by BACs in the assay. The same patient was also checked on Affymetrix Cytoscan array which confirmed the deletion with definite breakpoints as well as the mosaicism noticed in the BoBs analysis (Fig 5 & Table 2).

The assay can be used as an alternative to current prenatal testing and testing the newborns with normal karyotypes with suspected phenotypes. Most of the microdeletions selected in the array are flanked by segmental duplications (such as Prader–Willi/Angelman and Williams syndromes) and will most often have consistent-sized deletions but sometimes with variable-sized deletions. The size of the deletion cannot be determined by this assay and the size of the deletion sometimes is important to decide the gene content and possible phenotypic consequences, cases with positive results for these regions should be followed up with microarray testing to size the deletion as per previous studies. The BoBs assay has some advantages and a disadvantage when compared to microarray analysis, this assay is limited to the syndromes with known outcomes and won’t detect alterations of unknown clinical significance. The advantage of this assay is that it utilizes two to six beads with unique sequences per locus, which increases the confidence in abnormal calls compared to FISH, which utilizes a single probe for each target locus. The BoBs testing can be done in 24 h from the sample received in the laboratory to the result reporting. The turnaround time is same as the FISH aneuploidy testing performed on uncultured cells, but BoBs has additional features to detect known microdeletions. Another advantage is that it requires a small amount of input DNA (~150–240 ng) when compared to the DNA used in a microarray assay. So the assay can be considered an intermediate one while comparing with FISH and microarray and can be very useful for families who are not willing to go for expensive microarray testing.

Table 1: The median ratios recorded in two patients with abnormalities which are compared with normal male and female reference DNA.

| Sample | Female | Male | Threshold (R/M2) | FISH 1 | FISH 2 | FISH 3 | FISH 4 | FISH 5 | FISH 6 | FISH 7 | FISH 8 | FISH 9 | FISH 10 | FISH 11 | FISH 12 | FISH 13 | FISH 14 | FISH 15 | FISH 16 | FISH 17 | FISH 18 | FISH 19 | FISH 20 | FISH 21 | FISH 22 |
|--------|--------|------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1a     | Female | 8.69 | 0.87, 1.13, 0.80 | 1.02   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| 1b     | Male   | 12.79| 0.71, 1.21, 0.66, 1.32 | 0.99   | 0.96   | 1.11   | 0.94   | 0.99   | 1.07   | 1.07   | 1.05   | 0.97   | 0.97   | 0.97   | 0.97   | 0.97   | 0.97   |
| 2a     | Female | 7.60 | 0.86, 1.14, 0.75, 1.21 | 0.95   | 0.96   | 0.97   | 1.03   | 1.06   | 1.09   | 1.07   | 1.05   | 1.03   | 1.01   | 1.00   | 1.00   | 1.00   | 1.00   |
| 2b     | Male   | 8.17 | 0.84, 1.15, 0.76, 1.34 | 1.02   | 0.94   | 1.31   | 1.02   | 0.96   | 1.00   | 1.00   | 0.97   | 1.02   | 0.99   | 1.00   | 1.00   | 1.00   | 1.00   |

Summary

| Median Ratios |}

Proceedings of the 7th Annual Scientific Meeting of Gulf Medical University, 4th & 5th November, 2015
Figure 1: Karyotypic changes detected by Prenatal™ BoBs™ assay in male and female reference DNA.

Figure 2: The WBS critical region as seen in the UCSC web browser with refseq gene content. The red bar represents the area where the BAC’s in assay are selected.
Figure 3: Karyotypic changes detected by Prenatal™ BoBs™ assay in patient 2a who showed loss of 7q11.2 region representing Williams-Beuren syndrome.

Figure 4: Karyotypic changes detected by Prenatal™ BoBs™ assay in patient 3a who had an extra copy of chromosome 21 representing Down’s syndrome.

Table 2: Microarray results of the patient with Williams’s syndrome with definite breakpoints with candidate genes highlighted in red.

<table>
<thead>
<tr>
<th>File</th>
<th>Type</th>
<th>Chromosome</th>
<th>Cytoband Start (kbp)</th>
<th>Gene Count</th>
<th>OMIM ® Genes</th>
<th>OMIM ® Microarray Nomenclature</th>
</tr>
</thead>
<tbody>
<tr>
<td>CG</td>
<td>Loss 7</td>
<td>q11.23</td>
<td>1,423</td>
<td>28</td>
<td>NSUN5, TRIM50, FKBP6, FZD9, BA21B, BCL7B, TBL2, MLXIPL, VPS37D, DNAJC30, WBSCR22, STX1A, MIR4284, LINC00035, ABHD11, CLDN3, CLDN4, WBSCR27, WBSCR28, ELN, LIMK1, EIF4H, MIR590, LAT2, RFC2, CLIP2, GTF2IRD1, GTF2I</td>
<td>23</td>
</tr>
</tbody>
</table>
CONCLUSIONS

BoBs results show that 2 of 4 patients (50%) analyzed had structural and numerical abnormalities. Based on our preliminary result, we accept that this assay will prove to be a sensitive and rapid assay on prenatal and postnatal patient samples referred with congenital malformations. The assay is fast, precise, and cost-effective for molecular karyotyping that can be performed within 24 hours with minimal amount of DNA without culturing of the cells or tissues. The assay simultaneously detects several targeted regions that have been proved to be chromosomally associated disorders.

REFERENCES


Atypical Mycobacterial Infection: A Case Report

Rajagopal Ramachandran1,2*, Chopra Ajay2, Bindiya GP2, Nair Lakshmi3

1Department of Dermatology, Thumbay Hospital, Dubai, UAE, 2Department of Dermatology, Venereology and Leprosy, 3Department of Pathology, Command Hospital, Air Force, Bangalore, India.

*Presenting Author

ABSTRACT
A 58 years old lady, a known case of Rheumatoid arthritis involving large as well as small joints of the body since 27 years presented with widespread skin ulcers all over the body since 2 months. Prior to the onset of the ulcers she had been treated with oral steroids and methotrexate for rheumatoid arthritis in varying doses and duration. After the onset of ulcers too she had been treated with steroids on suspicion of rheumatoid vasculitis being the cause for the ulcers. She had been on antidiabetic drugs for previous 8 months due to elevated blood sugar levels.

Dermatological examination revealed multiple tender soft nodules and abscesses breaking down to form ulcers over both lower limbs, hip girdles, and upper limbs. Ulcer bases were necrotic and purulent discharge was evident from most ulcers. Some of the nodules were breaking down to form ulcers. No petechiae or purpura was seen. No cribiform scars were seen.

Patient was started on parenteral antibiotics pending bacteriology of the pus discharge from the ulcers. ZN stain of the pus revealed strongly acid fast thin beaded filamentous bacteria in large numbers suggestive of Atypical Mycobacterial Infection. Pending the culture and species identification, patient was started on parenteral antibiotics targeted towards atypical mycobacteria.

Over a few days the general condition of patient deteriorated as she de-saturated and had to be ventilated in the ICU. Tracheal aspirate also grew atypical mycobacteria and in addition Acinetobacter from wound swab. Despite best combination of antibiotics targeting both the infections, she continued to deteriorate into sepsis and succumbed to the illness.

Aim of presentation is to highlight the rarity of the case, importance of atypical mycobacteria as a cause of ulcers in immunocompromised patients, and resistance to chemotherapy of atypical mycobacteria resulting in the demise of the patient.

Keywords: Atypical mycobacterial infection, Mycobacterium abscessus, Rheumatoid arthritis, Immunodeficiency
INTRODUCTION

Atypical mycobacteria are opportunistic, acid-fast and ubiquitous organisms. With increasing immunosuppression due to Human Immunodeficiency Virus and immunosuppressants usage in malignancies, collagen vascular disorders and transplant patients, incidence of atypical mycobacterial infection is rising, outnumbering M.tuberculosis\textsuperscript{1,2}. Here, we report one such case where atypical mycobacterial infection mimicked multiple cutaneous vasculitic ulcers in a patient of Rheumatoid arthritis.

CASE REPORT

A 58 year old female farmer, with Rheumatoid Arthritis since 27 years, was on immunosuppressants with Methotrexate, oral steroids and hydroxychloroquine for 8 months prior to presentation. Treatment for Diabetes Mellitus was initiated two months back with oral hypoglycemic agents. She presented with multiple crops of painful raised nodular lesions over the hips, gluteal area, lower and upper limbs since 2 months. These nodules spontaneously ulcerated within 3-4 days with profuse pus discharge. She also had high grade fever with chills since 2 months, significant weight loss of 10kg in 3 months associated with loss of appetite and was bed bound.

Examination showed multiple, tender, well-defined, punched out ulcers of varying sizes with profuse discharge over upper limb, lower limbs and gluteal area. Ulcers had necrotic base, undermined edge, livid hue around the margins (Figures 1, 2). A differential diagnosis of rheumatoid vasculitis and Pyoderma gangrenosum was considered. Investigations revealed anemia (Hemoglobin-10gm/dl), random blood sugar-355mg/dl, and HIV negative. Ziehl Neelsen stain of pus discharge from ulcers showed long filamentous, beaded acid fast bacilli resembling Atypical Mycobacteria (Figure 3). Culture on Lowenstein Jensen medium showed growth of buffy colored colonies in 5 days. PCR test for \textit{M.tuberculosis} was negative.

Treatment was started with intravenous Inj Amikacin 375mg q12h, Inj Clarithromycin 500mg q12h and Inj Imipenem 1gm q6h. After an initial favorable response, the patient started desaturating, requiring ventilation. HRCT lung revealed bilateral lower lobe consolidation, and bronchoscopic guided tracheal aspirate showed the same organism (Figure 4).

A diagnosis of Disseminated Atypical Mycobacterial infection was made, possibly by rapid growers, pending specific tests. \textit{Acinetobacter} superinfection was also detected from the wound cultures. Despite aggressive antibiotic therapy including Tigecycline cover for \textit{Acinetobacter}, patient succumbed to overwhelming sepsis from both the infections.

Sub-typing of the atypical mycobacteria by biochemical tests (Nitrate reductase, iron uptake, Tween 80 hydrolysis– negative; arylsulphatase – positive) identified the organism to be \textit{Mycobacterium Abscessus}. 
DISCUSSION

The index case had disseminated cutaneous ulcers all over the body (25-30 ulcers) with pulmonary infection in the setting of immunosuppression from repeated steroid intake for treatment of rheumatoid arthritis and diabetes mellitus. The atypical mycobacterium was demonstrated both in skin and tracheal aspirate cultures confirming the diagnosis of disseminated infection. Despite exhibiting the patient to the cocktail of antibiotics known to treat *M. abscessus*, the patient succumbed to the infection suggesting the severity of infection and chemoresistant nature of this organism.

*Mycobacterium Abscessus* is a rapidly growing mycobacterium first described by Moore and Frerichs in 1953. *M. abscessus* was formerly considered to be a subspecies of *Mycobacterium chelonae* (*M. chelonae* subsp. *abscessus*), but on the basis of DNA homology studies it has been shown to be genetically distinct and has thus been elevated to a separate species status.

The major threat posed by this species is mainly due to its resistance to antibiotics. Indeed, *M. abscessus* is one of the most resistant organism to chemotherapeutic agents. *M. abscessus* produces enzymes that potentially degrade or modify antibiotics, which can result in their inactivation. It contains an aminoglycoside 2 – N – acetyltransferase and phosphotransferase that can confer aminoglycoside resistance.

*M. abscessus* is also known to be of three types of which one is relatively more chemo-responsive than the other two. Treatment of infections due to *M. abscessus* complex may benefit from molecular identification within the complex since *M. massiliense* appears more susceptible than *M. abscessus sensu stricto* and *M. bolletii*. If the index case was infected with any of the chemoresistant serovars of *M. abscessus* it may explain the failure to response to known antibiotics. However the facility to do subclassification of *M. abscessus* was not readily available at the time.

In conclusion, atypical mycobacterial infection poses both a diagnostic as well as a therapeutic challenge especially in patients with collagen vascular disorders on immunosuppression. Multiple cutaneous ulcers in a bedridden, known Rheumatoid arthritis patient are most commonly treated for vasculitic causes or for pyoderma gangrenosum with oral or parenteral steroids, which can further aggravate any infection. Hence a simple bedside ZN Stain or Gram stain is a must to exclude any bacterial infection before treatment is started with steroids.

Since the clinical presentation and treatment of subtypes of atypical mycobacteria vary, it is essential to obtain subtyping early in course of the illness to initiate appropriate treatment. The treatment of a patient with atypical mycobacteria remains a challenge even today due to the variable response to antibiotics.

Aim of presentation is to highlight a rare infective cause for ulcers in an immunocompromised patient and the poor outcome in disseminated atypical mycobacterial infections despite antibiotic therapy.
Figure 1: Multiple non healing ulcers over right gluteal region and thigh showing ragged and undermined edges

Figure 2: Multiple large ulcers on right upper limb and elbow of similar nature
Figure 3: ZN stain of pus swab showing numerous long filamentous acid fast bacteria (x 1000)

Figure 4: ZN stain of tracheal aspirate also showing numerous acid fast beaded bacteria (x 1000)
REFERENCES