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From the Editor

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This is the first issue for 2007, after a successful year for the journal in 2006. A number of initiatives were started in 2006 and new members joined the editorial board, which will greatly assist our ongoing success.. The Focus on Quality Care series, which started in 2006, will continue this year.

Throughout the previous years we continued in our efforts to coach authors toward better writing by helping in the writing process and revising the manuscripts and editing. We are hoping to organise a writing and editing workshop for the Middle East in 2007.

We are indebted for all the work of the production team and the editorial board which has contributed to our continuous success. Owing to the large numbers of papers received, and the great increase in readership we are planning to increase the frequency of the journal to 8 issues per year, in addition to starting a paid subscription for hard copies.

In this issue, Bener A ,]Al-Marri S, Azhar Abdulaziz A et al. investigated the link between consultation length and patient assessment care. The objective of this study was to assess the consultation length in a tertiary care teaching hospital and in general practice. The present study in Qatar showed that the average consultation time at the Hamad General Hospital ranged from 7.0 to 17.4 minutes. The average consultation time at the PHC ranged from 4.7 to 8.1 minutes. The authors concluded that the consultation length has increased in Qatar during the decade, however, it is still short by international and western standards.

A cross sectional cohort study from Iraq evaluated mother knowledge, practice and attitude towards childhood survival. The study reveled that the Knowledge and practice of mothers was, generally, not satisfactory towards diarrhoeal disease and ante-natal care, while the knowledge of mothers about ARI risk signs were better. The authors concluded that stressing health education and breast feeding will be of significant value.

A study from Turkey examined the variables that affect patient satisfaction when they are examined by students. The authors reviewed 185 patients; answers to 13 questions. Among the patients, 92.1% pointed out that students' examinations were helpful. 84.1% of the patients felt confidence in the examination. The authors stressed that this study showed that satisfaction with student participation is high, especially in the group of elderly, married, women, and in patients with less education.

A study from Bangladesh and China discussed a new concept of the velocity and Elasticity curves of Pregnancy Wastage and Caesarian Deliveries in Bangladesh. The aim of the authors was to investigate the effect of age of mother as a cause of pregnancy wastage and delivery types. Their results revealed that the risk of caesarian delivery increases with the increased age and this risk increases faster than age.

Ali Keshtkaran A & Keshtkaran V discussed factors affecting neonatal death in Fars Province, Southern Iran, 2004. The authors stressed that neonatal death is the third most common factor of mortality in their country. The authors concluded that there is a need for more attention on care from pre-conception, during pregnancy, and during delivery.

A case report from the UK report discussed Human chorionic gonadotrophin induced Hyperemesis and Hyperthyroidism in Pregnancy. The authors stressed that Hyperthyroidism secondary to b hcg is a recognized occurrence. It is something to consider when admitting a patient with hyperemesis as hyperthyroidism worsens and mimics signs of hyperemesis.

Dr Ahmed A evaluated and compared data contained in referral forms sent by primary health care center's physicians to the diabetic clinic, with that adopted by the American Diabetes Association (ADA). A total of four hundred and thirty (430) referral forms were collected. The authors concluded that the referral form is an important tool that needs great attention and regular review, to evaluate its components and its efficacy.

A review study from Saudi Arabia discussed the use of Angiotensin Converting Enzyme Inhibitor in Diabetes. The author stressed that Diabetes mellitus is one of the diseases that affects different systems in the body. Angiotensin Converting Enzyme inhibitors (ACEI) were the first class of antihypertensive drugs shown to reduce vascular complications among diabetics, independent of blood pressure reduction. The review highlighted the points which are not known by most of physicians using ACEIs, such as the history of ACEIs and the evidence base for the use of this group of therpautics.

Finally I would like to wish all our readers, editorial board and the production team a happy new year.

Launch of World CME - *Pakistan CPD Program*

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A team of medical educators and family doctors from Pakistan has joined with World CME to provide a QA&CPD program for Pakistani Family Physicians.

World CME is now used for QA&CPD or Accreditation in 9 countries to date. It uses multimedia training and interactive education to 'bridge the gap' in educational standards. The focus is to provide the highest quality medical education and training to particularly, developing nations doctors, but it is also used in developed countries for Quality Assurance and Continuing Medical Education and Continuing Professional Development.

All topic-based modules are written by University based medical educators or identified world experts on each educational topic. Education includes psychosocial; issues of both doctor and patient behaviour, and uses BASK questions (test on behaviours, attitudes, skills and knowledge).

Educational content has been reviewed for the situation in Pakistan and generally 'best practice' is spelt out, but where possible alternatives are found for practitioners in rural, remote or impoverished areas.

Education uses professional education techniques whereby participants compare their answers with those of the authors.

The Pakistan program provides over 50 extensive interactive case presentations as well as over 50 videos showing techniques and other medical training. The program is divided into 10 modules and there is a self-assessment exam to be undertaken at the end of the first three quarters. The last quarter provides a formal exam, of 100 questions, marked by the computer.

Additionally print out and video based patient education is also available on the CDs.

An annual quality Certificate of Satisfactory Completion, issued by World CME, is sent to all participants achieving a pass mark of 75% or more. Each annual volume will cover a new set of topics and also aim to keep doctors totally up to date.

Details can be obtained by contacting:

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Middle East Doctor of the Year for 2007

2007 Winner is Dr. Tawfik Khoja

The Middle East Journal of Family Medicine would like to congratulate our 2007 winner Dr. Tawfik Khoja, and invite nominations for our 2008 award.

About Dr Khoja

Present Position:

Director General, Executive Board Of The Health Ministers Council For Gcc States.

Speciality:

Primary Health Care, Family And Community Medicine Consultant.

Responsibilities In Capacity Of Executive Director Of The Executive Board Of The Health Ministers Council For Gcc: Council For Gcc:

I am responsible for supervising the activities of Executive Board (Technically, Administratively and Financially). I am also responsible for follow up the decisions and resolutions of the ministerial council and its execution to attain the goals and aims of the council. I represent the Executive Board in all dealings with the ministries as well as with other governmental and public institutions, National and International organizations as stated in the rules and regulations of the council.

I recommend plans and programmes of Joint GCC work and after approval of the council of ministers I supervise the execution, and follow up the work of the technical and consulting committees and supervising studies and researches approved from the council.

It falls under my duties to coordinate with international, regional and Arabian Organizations according to the rules and decisions of the council.

I prepare periodically yearly report of the work of the council and its achievements. I also suggests the plans of the Group Pharmaceutical and group purchase.

TERMINATION OF MISSED ABORTION WITH INTRAVAGINAL MISOPROSTOL (CYTOTEC)

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The work started in Aug 2004 to April 2005 at King Hussein Medical Center
The work will be attributed to Royal Medical Services

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Key words: Misoprostol, Termination, Missed Abortion.

ABSTRACT

Objective: To evaluate the effectiveness of intra-vaginal Misoprostol tablets (Cytotec) for termination of missed abortion.

Methods: Prospective study of patients with ultrasound examination, proved missed abortion during Aug 1999- Aug 2000. Setting: King Hussein Medical Center-Amman.

A total of 50 women with gestational age between 12-28 weeks were included in this study; 35 patients were below 30 years and 15 patients were above 30 years.

Women with missed abortion diagnosed by ultrasound examination and with (or without) history of previous delivery by cesarean section, were treated with 400 micrograms Misoprostol tablet inserted intra-vaginally. The dose was repeated at 4 hour intervals for up to 48 hours until effective uterine contractions were obtained.

Results: The mean time for termination was 14 hours, and only 4 patients (eight percent) required between 30-48 hours. Two patients (four percent) required 4 hours to abort completely. Conclusion: The use of Misoprostol intra-vaginally at a dose of 400 micrograms every 4 hours appears to be a safe, effective, practical method for the termination of missed abortion.

Introduction

Termination of pregnancy is one of the most common procedures in gynecological practice. Surgical termination has been used for first trimester termination of pregnancy. With the introduction of cervical ripening agents, complications were significantly reduced. Although complications are uncommon, surgical termination has been shown to be associated with uterine perforation, cervical injuries and significant blood loss. The overall complication rate varies between four and 10 percent.[1, 2]

A regimen of 600 µg of Mifepristone followed by 400 µg oral Misoprostol was approved for use in USA in September 2000, for elective termination of pregnancy up to 49 days gestation.[3]

Misoprostol is a synthetic 15-deoxy-16-hydroxy-16-methyl analogue of naturally occurring prostaglandin E1 that has been approved for administration by oral route for the prevention and treatment of gastro-duodenal ulcers associated with use of non-steroidal anti-inflammatory drugs. The drug is cheap, so increasing the dose will not influence the cost significantly, and it can be stored at room temperature.[2, 4, 5]

It has also become an important drug in obstetrical and gynecologic practice because of its utero-tonic and cervical-ripening actions. Misoprostol is useful for elective medical abortion, cervical ripening before surgical abortion, evacuation of the uterus in cases of embryonic or fetal death, and induction of labor. The drug may also be used to treat and even prevent postpartum hemorrhage. However, Misoprostol is not approved for any of these indications in the United States. Current product labeling includes a warning that Misoprostol is contraindicated during pregnancy because of its abortifacient properties.

However, the FDA recognizes that, in certain circumstances, off-label uses of approved products are appropriate, rational, and accepted medical practice.[6, 7]

The most common adverse effects of Misoprostol are nausea, vomiting, diarrhoea, abdominal pain, chills and fever.[7]

The effects of Misoprostol on the reproductive tract are increased, and gastrointestinal adverse effects are decreased, if the oral preparation of Misoprostol is administered vaginally.[8, 9]

When Misoprostol tablets are placed in the posterior fornix of the vagina, plasma concentrations of Misoprostol acid peak in one to two hours and then decline slowly. Vaginal application of Misoprostol results in slower increases and lower peak plasma concentrations of Misoprostol acid than when administrated orally, but overall exposure to the drug is increased.[10]

Among women who were 9 to 11 weeks pregnant and given Misoprostol before a surgical abortion, intrauterine pressure began to increase an average of 8 minutes after oral administration and 21 minutes after vaginal administration and was maximal 25 minutes after oral administration and 46 minutes after vaginal administration. Uterine contractility initially increased and then platituded one hour after oral administration, whereas uterine contractility increased continuously for

four hours after vaginal administration. Maximal uterine contractility was significantly higher after vaginal administration.[8]

Materials and Methods

Prostaglandin El analogue (Cytotec) at a dose of 400 micrograms vaginally were used in this study. Patients with missed abortion confirmed by ultrasound, with and without uterine scars, were used in the study.

50 patients were selected during a one-year period. Some were referred from private clinics and others came for routine antenatal care. On examination they were found to have missed abortion without obvious symptoms. All those patients were admitted to the gynecological ward.

Full history including gynecological and obstetrical records was taken and a full general examination was made along with any necessary laboratory investigations.

400 micrograms of Misoprostol (Cytotec) was inserted into the posterior vaginal fornix. The dose was repeated for up to 48 hours at 4 hours intervals until effective uterine contractions and cervical dilatation were obtained.

All women were followed up by an obstetrician, from admission until discharge. They were assessed for complications that might occur during the termination process. No artificial rupture of membrane was allowed during the study.

Results

The general characteristics of patients selected for this study were similar to those of our general population; 30% were nulliparous women and 70% were below the age of 30 - as shown in Table (1).

The mean time for termination was 14 hours. Two cases required only four hours while the majority (90 percent) required four to 18 hours. In 10 percent of the patients, abortion was achieved in 19-48 hours.

Side effects were minimal. There was no significant drop in hemoglobin level.

There were no recorded cases of puerperal sepsis and maternal deaths. No signs of prostaglandin toxicity (hyperactivity, fever, sweating and vomiting) were reported.

20 women (40 percent) underwent evacuation and curettage under general anesthesia.

Discussion

Prostaglandins have two direct actions associated with labor, ripening of cervix and direct Oxytocin action. Successful parturition requires organized changes in the upper uterus (in response to the estrogen - progesterone ratio) and the local release of prostaglandin.

The administration of Misoprostol (cytotec) intra-vaginally proved to be highly effective for termination in 50 patients with missed abortion within a gestational age that varied from 12-28 weeks.

Cytotec is an analogue of naturally occurring Prostaglandin E1, which promotes peptic ulcer healing and symptomatic relief. It is metabolized by fatty acid oxidizing systems present in organs throughout the body and it will increase uterine tone and contractions in pregnancy, which may cause partial or complete expulsion of the products of conception.[4, 5]

A lot of works have shown the combination of Misoprostol and Mifepristone to be an effective method of achieving therapeutic medical termination of pregnancy, in both first and second trimesters.[4, 11, 12]

In another study, they made a comparison between vaginal and oral Misoprostol when combined with Mifepristone in termination of second trimester pregnancy.[4]

There is one study, which shows a comparison of two regimens of intra-vaginal Misoprostol for termination of second trimester pregnancy. Doses of 400 micrograms every 3 hours or every 6 hours were successful in evacuating the uterus.[5]

The variation in rates of complete abortion among women given Misoprostol alone may be due to differences in study design, since rates are often lowest in randomized trials; or to efforts to increase vaginal absorption of Misoprostol in some studies. For example, in one study in which the success rate was high, the vagina was cleansed with sterile water or moistened with two or three drops of water (or saline) and then a tablet of Cytotec was placed in the posterior fornix of the vagina; and the women were required to remain supine for three hours after placement of the tablets.[13]

Conclusion

Our protocol was to use cytotec tablet intra-vaginally, 400 micrograms every four hours to avoid the side effects. It is a very effective and safe method of termination, as shown in our study.

Because of the small number of women included in this study, we recommend to apply it to a larger scale to support our results.

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EFFICACY OF LOCAL ANESTHESIA IN CARPAL TUNNEL SYNDROME RELEASE

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ABSTRACT

Objective: Our aim is to determine the effectiveness and patient's tolerance of local infiltration anesthesia in carpal tunnel release surgery.

Methods: This study was done in the period between March 2006 and November 2006 at the Princess Haya Military Hospital in Aqaba, and sixteen patients with carpal tunnel syndrome were included. 10 ml 1% lignocaine was infiltrated into the skin and subcutaneous tissue with arm tourniquet. Patients' pain from tourniquet and surgery site was assessed.

Results: The mean duration of surgery was less than 15 minutes. 4(25%) of patients reported mild tolerable pain due to tourniquet and 3 patients reported it at the site of surgery but with no supplemental anesthesia used. No complication of the anesthesia or the surgery was encountered. Six week follow up of patients showed complete relief of symptoms.

Conclusion: Local infiltration anesthesia is a safe, rapid and well accepted, and tolerated by patients in carpal tunnel release surgery.

Introduction

Carpal tunnel is the most commonly diagnosed and treated entrapment neuropathy with pain, paresthesia and weakness at the distribution of the median nerve in the hand[1].Treatment modalities were either conservative versus surgical release, open or endoscopic[2,3].

Different anesthesia modalities reported for carpal tunnel release (CTS) include intravenous regional, distal nerve block at wrist and local infiltration anesthesia[4,5,6].

This is a prospective study to determine the efficacy and patients' tolerance of local anesthesia infiltration (LA) in CTS release surgery.

Methods

This study was done in the period between March 2006 and November 2006 at the Princess Haya Military Hospital in Aqaba. 16 patients with signs and symptoms of carpal tunnel syndrome and EMG findings of moderate to severe degrees, with failed conservative treatment were included in the study. Exclusion criteria included prior CTS release on the involved hand; known mass, tumor or deformity; diabetes mellitus, rheumatoid diseases; and pregnancy or lactation.

A 25-gauge needle was used to infiltrate a 10 ml 1% lignocaine into the skin and the underlying subcutaneous tissue without involving the flexor retinaculum to avoid needlestick injury to the median nerve. The hand was then cleaned, draped and the tourniquet inflated after the arm was exsanguinated. The median nerve was decompressed through a skin incision made along the thenar area by releasing the transverse carpal ligament and the skin closed by absorbable 5/0. Patients were followed up in clinic after one week and six weeks.

The tourniquet pain and pain during surgery was evaluated using the four-level score with 0=no pain; 1=mild pain; 2=moderate pain; and 3=severe pain.

Results

In the study, 11patients were females with a mean of age 30 years and 5 males with a mean age of 42 years.

The mean duration of surgery was less than 15 minutes. There was no pain at site of surgery in 81.25% of patients with mild pain in 3 patients but no supplemental anesthesia was needed during surgery as shown in Table I.

Moderate and severe tourniquet pain were not experienced and the pain was experienced during the inflation of the tourniquet. 4 (25%) of patients reported mild pain but there was no need to decrease the pressure as shown in Table 1.

All patients reported good relief of symptoms after 6 week follow up and satisfaction with the local anesthesia. No complication of anesthesia or surgery was detected.

Discussion

Carpal tunnel syndrome (CTS) release can be either open or endoscopic with limited evidence to suggest a significant difference, although open release is with fewer complications[7]. Various anesthetic techniques have been reported including local anesthesia, intravenous regional and block at wrist anesthesia [4,5,6,7].

Local infiltration anesthesia is a more practical, rapid, safe technique with least complications, as we found in our study[6,8].

A bloodless field is essential in CTR and arm tourniquet is the choice but tourniquet pain may become intolerable if applied more than 30 minutes[9]. The 4 patients experienced a tolerable mild tourniquet pain and did not need any analgesia or pressure release.

In our study, the anesthesia infiltration was to skin and subcutaneous tissue and not deep to avoid needle stick injury or edema around the synovial sheath as reported[8].

Local anesthesia can be used in uncomplicated CTR surgeries while other techniques as IV regional anesthesia can be used in case epineurolysis or tenosynovectomy is needed[6].

Conclusion

Local anesthesia in carpal tunnel release surgery is an effective, quick and safe technique with good patient satisfaction.

TABLE 1. 4 level scale assessment of pain:

Pain scale	0 scale	1 scale	2 scale	3 scale
Tourniquet pain	**12(75%)**	**4(25%)**	**0**	**0**
Site of surgery pain	13(81.25%)	3(18.75%)	0	0

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PREVALENCE OF METABOLIC SYNDROME AMONG HEALTHY KUWAITI ADULTS: PRIMARY HEALTH CARE CENTERS BASED STUDY

Key words: Metabolic syndrome, adults, Kuwait

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ABSTRACT

Objective: The objective of the present study was to estimate the prevalence of metabolic syndrome among healthy Kuwaiti adults attending two primary health care centers in Kuwait.

Methods: A convenience sample of 434 Kuwaiti nationals aged from 20-44 years who were attending the health centers for routine check up and who were not suffering from or have ever been diagnosed with any chronic illness such as diabetes, hypertension, heart problems or dyslipidaemia. The National Cholesterol Education Program - Adult Treatment Panel III criteria of metabolic syndrome were used. Body mass index was determined. Waist circumference, levels of fasting blood glucose and fasting plasma lipids (triglycerides and high-density lipoprotein cholesterol), blood pressure were measured.

Results: The total number of people who met the criteria of metabolic syndrome were 78 (18%); 62.8% of them were males. The prevalence of overweight and obesity were 27% and 37.3% respectively with no significant gender differences. Low HDL-C was found in 50.7% (48.5% of males and 54.3% of females), central obesity was prevalent among 34.6% and was significantly more common among females than males (45.7% vs 27.8% respectively). High TG was prevalent among 19% where males rated significantly higher, double that of females (28.9% vs 14.1% respectively). About 17% of the sample was suffering from either high blood pressure (17.0% of males and 15.9% of females) and/or impaired fasting blood glucose (18.9% of males and 14.0 of females).

Conclusion: The prevalence of metabolic syndrome is high among healthy adults attending primary health care centers in Kuwait.

Introduction

Metabolic syndrome is the disease of the new millennium; its prevalence is increasing dramatically because of the rising number of people who are obese and inactive.[1]

To date there is no global consensus on a definition of metabolic syndrome.[2] In 1998 the World Health Organization (WHO) proposed a formal definition of metabolic syndrome, and three years later, the National Cholesterol Education Program – Adult Treatment Panel III (NCEP – ATP III) proposed its definition. The European Group for the study of Insulin Resistance (EGIR) also developed a definition. The attention brought by the report of the NCEP – ATP III to the metabolic syndrome has ignited an intense interest, as evidenced by the numerous publications and meetings concerning the metabolic syndrome.[3,4]

"The whole is greater than the sum

of its parts" such axiom is the case with metabolic syndrome.[4] The major characteristics of metabolic syndrome include insulin resistance, abdominal obesity, elevated blood pressure (BP) and lipid abnormalities in the form of elevated levels of triglycerides and low levels of high density lipoprotein cholesterol (HDL-C)[3]

To have a mechanistic view of how metabolic syndrome develops, it is necessary that obesity viewed as a contributory factor to insulin resistance/hyperinsulinaemia rather than a consequence of the defect in insulin action. It is to be emphasized that obesity increases the likelihood that an individual will be insulin resistant but the reverse is not true.[5]

Metabolic syndrome has piqued the interest and concern of physicians. It represents a co-mingling of several conditions and risk factors and links accelerated cardiovascular disease (CVD) with insulin resistance.[6] This cluster of risk factors is responsible for much of the excess CVD morbidity among overweight and obese patients and those persons with type 2 diabetes.[3] By the time a diagnosis of diabetes type 2 is made, about 70 to 90% of patients have metabolic syndrome irrespective of ethnicity or definition used.[2,3]

Currently the metabolic syndrome is viewed as the phenotypic confluence of central obesity, atherogenic dyslipidaemia, hypertension, and insulin resistance (with or without type 2 diabetes) resulting from deregulated gene expression and lifestyle behaviors.[7]

Kuwait showed rapid progress within the span of one generation. The economic and social development brought sedentary lifestyle changes to the Kuwaiti population. Accordingly, the prevalence of obesity in Kuwait is increasing gradually and may be the highest among the Gulf countries [8]. It turns out to be a major public health problem as 79.7% of the adult males and 81.2% of adult females are overweight and obese.[9] In view of that, the aim of the present study was to estimate the prevalence of metabolic syndrome and the high-risk aspects contributing to it among healthy Kuwaiti adults attending two primary health care centers in Kuwait.

Methods

A cross sectional study was carried out on subjects attending Quortuba and Abdulla Al-Salem primary health care centers for routine examination. The inclusion criteria were Kuwaiti nationals aged from 20-44 years who were attending the health center for routine check up and who were not suffering from or have ever been diagnosed with any chronic illness such as diabetes, hypertension, heart problems or dyslipidaemia. Pregnant females were excluded.

A convenience sample of 434 subjects was invited to participate in the study after having an individual verbal consent for involvement. A relevant history, physical examination and laboratory investigations were performed as part of routine check up.

Data collected included personal data: age, gender and some lifestyle behaviors such as current smoking status and level of regular aerobic physical activity such as brisk walking at least 30 minutes per day, most days of the week, according to the recommendation of lifestyle modification, Seventh report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High blood Pressure [10]. The NCEP-ATP III criteria of metabolic syndrome were used, and it dictates that the aggregation of three or more of the following:[2]

1. Abdominal/central obesity (waist circumference) more than 102 cm (40 inch) in men and 88 cm (35 inch) in women.
2. Hypertriglyceridaemia is equal to or more than 1.7 mmol/L.
3. A Low HDL-C level less than 1.036 mmol/L for men and1.295 mmol/L for women.
4. High blood pressure equal to or more than 130/85.
5. Impaired fasting blood glucose (FBG) equal to or more than 110 mg/dL (6.1 mmol/L).
6. Blood samples were collected in the lab, following the usual procedures. FBG (after 6-8 hours of fasting) and lipids profile -HDL-C and triglycerides- (after 12-14 hours of fasting) were assessed.

Blood pressure was measured with a standard mercury sphygmomanometer on the left arm after at least 10 minutes of rest. Mean values were determined from two independent measurements.

Waist circumference was measured to the nearest cm while subjects were fasting overnight and wearing only underwear. Subjects' weight (to the nearest half kg) and height (to the nearest cm) were measured using the Detecto-Scale. Calibration was done every morning before use. Body mass index (BMI) was calculated. Subjects with BMI equal to or greater than 30.0 Kg/m2 were classified as obese, and those with BMI 25-29.9 Kg/m2 were categorized as overweight and 18.5-24.9 Kg/m2 were normal.[11,12]

Data were analyzed using the Statistical Package for Social Sciences (SPSS), version 14. Student t-test, Chi-square test, ANOVA test and binary logistic regression test were used to determine the gender differences in the prevalence of metabolic syndrome and the predictors contributing for its occurrence. The level of significance was $p< 0.05$, at 95% confidence interval (CI).

Results

The study was carried out among 434 Kuwaiti adults; the majority were males (62.2%). The mean age and standard deviation (SD) was 29.2 (6.5) years where females were significantly older than males (30.3 and 28.6 years respectively).

Only about one third (35.7%) of the participants had normal BMI, while overweight (27%) and obesity (37.3%) showed no significant gender differences (31.1% & 39.6% of females respectively) and 24.4% & 36% of males respectively. The mean BMI was 28.4 (6.9) and ANOVA analysis showed significant gradual increase by age. It increased from almost 27 during the 20s to about 30 in the 30s to 32.3 in the 40s ($p<0.0001$).

Males significantly dominated females regarding smoking (61.5% vs. 2.4% respectively, $p<0.0001$) and exercising regularly (47.4% vs 21.3% respectively, $p<0.0001$).

The prevalence of the five biochemical indices for diagnosing metabolic syndrome according to NCEP-ATP III criteria is illustrated in Table 1. Low HDL-C showed the highest prevalence (50.7%), followed by central obesity that was prevalent among more than one third of the sample (34.6%) and was significantly more prevalent among females than males (45.7% vs 27.8% respectively). High TG was prevalent among 19% and followed an opposing gender pattern where males rated significantly higher than double females (28.9% vs 14.1% respectively). About 17% of the sample were suffering from high blood pressure and impaired fasting blood glucose.

Table 2 revealed that almost 18% of the healthy Kuwaiti adults included in the study with almost equal prevalence among males and females were suffering from metabolic syndrome. Also about another quarter (23%) was at high potential risk of developing metabolic syndrome (diagnosed with 2 criteria of the NCEP-ATP III) Multivariate binary logistic regression analysis was performed to eliminate the effect of potential confounders. Metabolic syndrome was the dependent variable (0=subjects with no metabolic syndrome, 1=subjects with metabolic syndrome). The classification matrix overall prediction accuracy showed that 79.7% of the subjects were correctly identified by the model. Four factors (age, gender, smoking status and practicing exercise) represented the independent variables. Age was the only significant predictor for metabolic syndrome as getting older gradually raised the risk of developing metabolic syndrome from 2.4 times (risk) in the early 30s to 3.5 times (hazard) in the late 30s to 4.4 times (vulnerability) in the early 40s compared to early 20s as illustrated in Table 3.

Discussion

The prevalence of metabolic syndrome (18%) among healthy adults is remarkably alarming. Our study focused on apparently healthy young individuals who were not treated for any chronic illness, and who can be easily missed being recognized as harboring a CVD risk when they visit their clinicians for any other reason. Many of them could be considered free of, although according to the criteria of ATP – III they are diagnosed as having metabolic syndrome.

This study can be considered the only one done in Kuwait and maybe in the Gulf area, estimating the prevalence of metabolic syndrome among healthy adults. The results of this study although lower than the prevalence of metabolic syndrome (34%) using the ATP-III, among a group of hypertensive Kuwaiti adults above 40 years, but more hazardous. Those people were unaware about the towering risk factors that threatened their lives and made them more prone to suffer from CVD at any point of time[13]. This finding also is in concordance with the study performed among US adults using ATP-III criteria and reported prevalence of metabolic syndrome of 21.8%.[14] Moreover, the presence of about one quarter having two criteria of ATP-III are at risk of developing metabolic syndrome in a few years when get older, and add to the seriousness of the situation. This echoes the increasing morbidity and mortality rates from developing CVD and diabetes mellitus type 2 in early ages.[15,16] As a construct that denotes risk factor clustering, the metabolic syndrome has been a useful paradigm. That is, it draws attention to the fact that some CVD risk factors tend to cluster in patients so predisposed. The teaching point implied by the term, and explicitly stated by the NCEP – ATP III, is that the identification of one of the risk variables in a patient should prompt a search for others.[17]

Understanding the prevalence of metabolic syndrome is critical in helping define the public health burden. The lack of a standard definition has impeded greatly the efforts to determine the prevalence. Efforts by the WHO, NCEP-ATP III, and the EGIR to develop standard definitions have been critical in trying to determine the prevalence of metabolic syndrome.[4] The actual prevalence of metabolic syndrome varies greatly by definition used, and in population groups, studied.[2]

All reports on the definition of metabolic syndrome have mainly emphasized lifestyle interventions as first-line management.[18] Lifestyle modification is an essential part of weight loss for people with or at risk of metabolic syndrome. Maintaining a healthy diet and weight, performing 30 to 60 minutes of moderately intense exercise every day and quitting smoking can all help reduce a person's chances of developing heart disease.[1] This was not analogous with the finding that almost two thirds of the healthy Kuwaiti adults were not practicing exercise regularly.

Getting older was the only predictor for metabolic syndrome in the present study and this reflects the further sedentary lifestyle and lack of healthy habits by the aged in the studied population. This is in agreement with a consistent finding in several studies using different definitions and that is the observation that the prevalence is highly age-dependent.[19]

Sedentary lifestyle, inadequate nutrition and physical inactivity are the roots of the syndrome and it has been strongly recommended that a healthy lifestyle that holds optimum body weight and increased physical activity should be adopted. Consequently, the non-pharmacological therapy of the metabolic syndrome should be emphasized. The most important treatment is the reduction of body weight in the presence of obesity, which is relevant for almost 90% of the patients. Body weight can rapidly be diminished by hypocaloric diets. Increased physical activity also lowers weight or prevents relapsing. Both methods, reducing diet and physical training, act on various factors related to insulin resistance. For example, hypocaloric diets activate thyroxine kinase of the insulin receptor and reduce glucose and insulin in plasma. Physical training reduces not only insulin and glucose in plasma but also frees fatty acids and increases capillary density in skeletal muscle.[20] As obesity is a major public health problem in Kuwait, hence further studies are recommended to identify the syndrome in the general population.

The largest public health benefits will be in preventing the development and progress of metabolic syndrome. The challenge is to transform attitudes and change behaviour. Long-lasting

changes in lifestyle are essential in order to achieve health enhancement. Therefore, programs on individual or social basis are required in order to improve nutrition and increase physical activity.

Conclusion

Prevalence of metabolic syndrome among healthy adults attending the referred primary health care centers in Kuwait is high and echoes rapid intervention. Lifestyle behaviour programs should be considered to help people to adapt effectively to a healthy way of living. Family physicians are recommended to use ATP-III criteria for early detection of high risk subjects.

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Table 1. *Distribution of NCEP-ATP III criteria for diagnosis of metabolic syndrome.*

Variables	Total n=434	Males n=270	Females n=164	p value*
Central obesity				
Not obese	65.4	72.2	54.3	
Obese	34.6	27.8	45.7	0.0001
TG				
Normal	81.1	78.1	85.9	
High	18.9	28.9	14.1	0.04
HDL-C levels				
Desirable	49.3	51.5	45.7	
Low	50.7	48.5	54.3	0.25
Blood pressure				
Normal	83.4	83.0	84.1	
High	16.6	17.0	15.9	0.75
FBG				
Normal	82.9	81.1	86.0	
Impaired	17.1	18.9	14.0	0.19

*Chi square test

Table 2. *Prevalence of metabolic syndrome in healthy Kuwaiti adults.*

Variables*	Total n=434 (%)	Males n=270 (%)	Females n=164 (%)
No metabolic syndrome	28.3	30.4	25
At potential risk for metabolic syndrome:			
1 symptom	30.9	28.9	34.1
2 symptoms	22.8	22.6	23.2
Metabolic syndrome:			
(≥ 3 symptoms)	18.0	18.1	17.7

Chi square test , *p>0.05

Table 3. *Binary logistic regression of significant predictors for metabolic syndrome.*

Variables	β	Adjusted OR	95% CI	p value
Age (years):				
20 – 24 (RG)				
25 – 29	-0.614	0.541	0.24 – 1.25	0.15
30 – 34	0.868	2.37	1.18 – 4.76	0.02
35 – 39	1.265	3.54	1.75 – 7.16	<0.0001
40 – 44	1.480	4.39	1.97 – 9.79	<0.0001

The adjusted variables were: age, gender, smoking, physical exercise
RG: Reference group

ABSTRACT

In April 2003, the Human Genome Project was pronounced complete. Now, as we officially enter the genomics era, what will this mean for health and society? Will genomic information lead to new opportunities for preventing diseases or will it provide new mechanisms for excluding people from insurance or employment? Will genomics make any real difference to the practice of medicine? The intent of this review article is to address public concerns about genomic information and the various implications of knowing the sequence.

GENE AND GENOMES: IMPACT ON MEDICINE AND SOCIETY THE HUMAN GENOME PROJECT AND BEYOND

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Introduction

The human genome project (HGP) is an international research program that was set up to characterize the genome of humans and other organisms; to develop the new technology needed to do so; and to address the ethical, legal, and social issues (ELSI) that may arise from the project. The possibility of sequencing the human genome was first discussed in the mid-1980s. The HGP officially started in October 1990 and was completed in April 2003. The HGP has revealed that there are probably 20,000-25,000 genes, much lower than previous estimates of 80,000 to140, 000. The human genome contains 3.2 billion chemical nucleotide bases. The average gene consists of 3,000 bases, but sizes vary greatly, with the largest known human gene being dystrophin at 2.4 million bases. The human genome also revealed that at least 80% of the genome does not code for proteins and only about 1.5% of the genome is occupied by protein-coding sequences, which raises the question of what function the non-coding DNA has. Sequencing the human genome will have a great impact on the practice of medicine and society. The field of medicine is building upon the knowledge, resources, and technologies emerging from the HGP to further understanding of genetic contributions to human health. As a result of this expansion of genomics into human health applications, the field of genomic medicine was born. Although this genetic advance raises hope for new ways to prevent diseases and promote wellness, it also raises public concerns about the privacy of health information and the potential of discrimination. It is clear that there is a need for society to understand, debate and decide on the appropriate setting for the use of genetic information (Dennis and Gallagher, 2001; HGP, 2004).

Human genome and the practice of medicine

The term genomic medicine has been recently used to describe a new development in medicine that holds promise for human health. This new approach to health care uses the genetic makeup of an individual to identify those who are at a higher risk of developing certain disease and to intervene at an earlier stage to prevent these diseases (Hall et al., 2004).

Genomic and common diseases

Information about the human genome sequence must be applied to identify the particular genes that play a role in the hereditary contribution to common diseases. For a disease such as diabetes mellitus, 5 to 10 (or maybe more) genes are involved, all of which increase disease risk only modestly because their effects depend on interactions with other genes and with the environment. Predictive genetic tests for the vast majority of common diseases are not yet available in medical practice with the exception of breast and colorectal cancer. But with increasing genetic information about common diseases, this kind of risk assessment will become more generally available, and many primary care clinicians will become practitioners of genomic medicine, having to explain complex statistical risk information to healthy individuals who are seeking to enhance their chances of staying well. This will require substantial advances in the understanding of genetics by a wide range of physicians, nurses, and clinicians (Collins and McKusick, 2001; Hall et al., 2004).

Pharmacogenetics

People vary in their response to medication. The variation between individuals in their response to medicines is due to differences in their genetic make-up. Although factors like inaccurate prescription of medication, the mixing of incompatible drugs, and poor compliance by the patient can influence the efficacy and toxicity of medicines, understanding the role of genetic variation in drug response could have important implications for the improved safety and effectiveness of treatment. Pharmacogenetics refers to the study of DNA sequence variation that affects an individual's response to drugs. Pharmacogenomics refers to the use of genetic information in order to target pharmaceutical agents to specific patient populations in the design of drugs. Clinical observations of individual variation in relation to drug toxicity and efficacy were first observed in the 1950s (WHO and Nuffield council on bioethics). Genetic variation in cytochrome P450 genes, acetyltransferase genes, thiopurine methyltransferase and dihydropyrimidine dehydrogenase has

clinical significance because in each case it defines patient populations that metabolize drugs at different rates. The availability of genetic information will provide important insight into the variation in response and toxicity to many drugs (Bell, 2004).

Despite the benefits of pharmacogenetics, it may be accompanied by unintended negative consequences. For instance, the introduction of pharmacogenetics could lead to a further stratification of the market for drugs, discouraging pharmaceutical companies from developing medicines that would provide a significant benefit to only a small number of patients. Wide-range programs of pharmacogenetics may require obtaining extensive genetic information, which raises concerns about the appropriate protection of patients' privacy and confidentiality. Furthermore, the targeting of specific populations may make it easier to unfairly discriminate against some groups. Pharmacogenetics, which is in its very early stages of development, needs to be carefully evaluated in order to determine its effectiveness relative to existing methods, and also to judge how, if applied, it would fit into the existing health care framework (WHO and Nuffield council on bioethics).

Nutrient-gene interaction

The concept of nutrient-gene relationships is not new. Inborn errors of metabolism provide familiar examples of nutrient-gene relationships. For example, phenylketonuria results from a specific mutation in both copies of the gene encoding the enzyme phenylalanine hydroxylase. This disease is characterized by the accumulation of phenylalanine in the blood because of the cells' inability to convert phenylalanine to tyrosine. Affected newborns are mentally retarded, unless they are placed on a special diet, in which case essentially normal intellectual development can be expected. Another example of a nutrient-gene relationship disorder is hemochromatosis. Hemochromatosis is a condition in which iron accumulates in tissues, which eventually leads to organ damage. It results from a mutation in both copies of the gene that encodes the enzyme that regulates iron absorption. Treatment includes phlebotomy and avoidance of iron supplements (Kauwell, 2005).

The study of the relationship between a specific genotype and the risk for developing diet-related diseases, particularly common chronic diseases such as cancer, diabetes, and vascular disease, has been referred to as nutrigenetics (Kauwell, 2005). An interaction has been demonstrated between folate status and a mutation of a key enzyme in one-carbon metabolism,methylenetetrahydrofolate reductase enzyme (MTHFR C677T). The reduced MTHFR activity leads to an increased level of cytosolic 5,10-methylenetetrahydrofolate available for thymidylate synthesis, which may protect cells from DNA damage induced by uridylate misincorporation. Thus folate-replete men who are homozygous for the TT mutation are reported to have a two-fold reduction in risk of colorectal cancer compared with wild type or heterozygous individuals. However, homozygotes with inadequate folate intake have elevated plasma homocysteine, an independent risk factor for atherosclerosis, which is associated with increased risk of neural tube defects and colon cancer (Fairweather-Tait, 2003).

Nutrient-gene interactions may also explain why some individuals respond more favourably to dietary interventions than others. For example, blood pressure is controlled in part by a vasoconstrictor-angiotensin. A single nucleotide polymorphism (SNP) in the gene that encodes the precursor form of this polypeptide, angiotensinogen (ANG), results in a guanine to arginine substitution (G-6A) in the promoter region of the gene. The AA genotype for the ANG G-6A polymorphism has been associated with higher levels of circulating angiotensinogen and essential hypertension. Results taken from a sub-study of subjects who participated in the Dietary Approaches to Stop Hypertension (DASH) trial revealed that subjects with the AA genotype were more responsive to the DASH diet than those with the GG genotype. Understanding nutrient-gene interactions that modulate the response to nutrition interventions holds promise for improving our ability to prevent and effectively treat chronic diseases (Kauwell, 2005).

The human genome and psychiatric disorders

There has been substantial epidemiological evidence that psychiatric illnesses have a strong genetic basis. Concordance rates among monozygotic (MZ) twins for schizophrenia, bipolar disorder, alcoholism and Tourette syndrome are ~50%. Major psychiatric disorders such as schizophrenia, bipolar disorder, autism and alcoholism are multi-factorial just like other multigenic disorders such as hypertension and diabetes. Nevertheless, in contrast to some other complex disorders, no susceptibility loci for psychiatric disorders have been unambiguously identified. The availability of the human genome sequence provides a starting point for the identification and characterization of individual sequence variation, including variation that confers susceptibility to psychiatric illness (Stoltenberg and Burmeister, 2000; Cowan et al., 2002).

Human genome and Society

While the HGP raises hope to improve health, it also highlights many ethical, legal, and social implications. Threats to privacy; stigmatization; potential for genetic discrimination in health insurance, life insurance, and employment; and disruption of familial and social relationships are now very real societal issues (Tinkle and Cheek, 2002). The U.S. Department of Energy (DOE) and the National Institutes of Health (NIH) devoted 3% to 5% of their annual Human Genome Project (HGP) budgets toward studying the ethical, legal, and social issues (ELSI) surrounding availability of genetic information. This represents the world's largest bioethics program, which has become a model for ELSI programs around the world.

Genetic enhancement

The concept of eugenics came out by Sir Francis Galton and Charles Davenport in the late nineteenth and early twentieth centuries, created an atmosphere of fear on the social applications of genomic technologies in this century. Eugenics (derived from the Greek word meaning 'wellborn') is the use of genetics to improve the quality of humankind. Eugenic policies

ranged from restrictions on immigration to the involuntary sterilization of jailed criminals or persons institutionalized for reasons of "insanity or feeblemindedness". This type of thinking was also incorporated in the Nazi German policy of racial cleansing which lead to the mass extermination of millions of Jews, Gypsies, homosexuals, and other "disfavoured". Eugenic ideas are not confined to the early twentieth century and are still being applied today. For example, the law in China forbids mentally retarded people from marrying unless they have been sterilized (Dennis and Gallagher, 2001; Brown, 2002).

The ideas of the original eugenicists have been largely discredited. However, there are ethical concerns that a new form of eugenics could emerge, whereby genomic technologies may be used to help people select a desirable trait for their children, such as physical attributes, IQ and personality. This raises the prospect of so-called "designer babies". Fortunately, there are many barriers blocking such development. Technically, it is extremely difficult to find which genes, in which combinations, create the desirable trait. Moreover, environment and upbringing play a big part of how a child develops (Dennis and Gallagher, 2001).

Genetic discrimination

The potential use of genetic information, particularly in health insurance, employment, and medical research raises grave anxiety. There are public concerns that a genetic "underclass" might develop.

Public concern about the confidently of genetic information may make people reluctant to volunteer for studies involving disease linked gene mutations or genetic therapy, for fear that the results could result in the loss of a job or the loss of insurance coverage (Collins, 1999). Employers may use genetic information to avoid hiring workers who they believe are likely to take sick leave, resign, or retire early for health reasons. There are also concerns that genetic information may be used to deny insurance access. Several cases have been reported where individuals with a genetic disorder or predisposition have been refused their health insurance, or had their enrolment cancelled or premiums increased. In the early 1970s, some insurance companies denied coverage and charged higher rates to African Americans who were carriers of the gene for sickle cell anaemia, even though they were healthy. There are worries that medical expenses for those suffering from genetic conditions will not be covered and children at high risk of inheriting a genetic disease may be excluded from coverage (Dennis and Gallagher, 2001). Fortunately, laws are being put into place to ensure the confidentiality of genetic information and to ban the use of genetic information in employment and health insurance (Brown, 2002). However, these laws are not always helpful in providing adequate protection against genetic discrimination since a woman's family history of having numerous relatives with early onset breast and ovarian cancer reveals almost as much about her risk of future disease as her own test results for mutations in BRCA1. In actuality, she could be mutation-negative, but still have elevated risk if the cancers in her family were caused by mutations in different genes or by environmental exposure (Clayton, 2001).

Although genetic information is personal, it could be made available without a person's knowledge, or even against his or her wish. For example, an employer or insurance provider may require access to medical records, which include the results of genetic tests. Disclosure of genetic information may be considered an invasion of privacy. Holders of genetic information should be prohibited from releasing it without the individual's prior authorization and an individual's consent should be required for each disclosure in order to protect the use of genetic information for purposes other than what it was originally collected for (Dennis and Gallagher, 2001).

DNA data banking

The rapid growth of forensic science DNA banking raises social concerns that genetic information will be used for purposes other than it originally collected for (Reilly and Page, 1998; Dennis and Gallagher, 2001).

DNA has been a key 'witness' for several trials, helping police and courts to identify criminals and to exonerate the wrongly accused (Dennis and Gallagher, 2001). DNA forensics in the United Kingdom has grown very rapidly since its inception in the mid-1980s. In June 1998, the UK Forensic Science Service had collected 320,000 samples for DNA analysis, and had removed 51,000 samples from the bank after suspects had been exonerated. The social impact of DNA forensic data banking are potentially much larger than those of the old practice of collecting and storing fingerprints of arrested individuals. A fingerprint provides information relevant only to identification. DNA forensic banks retain whole DNA, and many laws permit research on these samples. Such DNA archives will be of huge interest to those who study human behaviour, and especially to those who study criminality. Suppose, for example, an association study indicated that persons convicted of vehicular manslaughter are ten-fold more likely than those in a control group to carry an allele thought to predispose to alcohol abuse. If such correlations are found, they will influence practices (for example, sentencing and parole) in the criminal justice system (Reilly and Page, 1998).

Who owns the gene?

A patent is a set of exclusive rights granted by a government to an inventor for a limited amount of time (normally 20 years from the filing date), during which time others cannot make, use or sell the invention unless the inventor licenses it to do so. Patents were developed to encourage investments, to reward inventiveness and to make information about inventions publicly available. Gene patenting has, however, been controversial. There are some debates about gene patenting to whether a naturally occurring entity, such as a gene be viewed as an invention. Patenting offers an incentive for researcher to translate genetic discoveries into genetic medicine. On the other hand, patenting also pervades health care delivery. The discovery of disease genes requires the involvement of patients and their families. However, when the gene discovery is commercialized, the very same patients find that they are unable to obtain testing because some investigator or institution exercises patent. These patients may be required to pay what they perceive to

be unreasonable costs for tests and treatments derived from the gene that they helped identify (Clayton, 2001; Dennis and Gallagher, 2001). The case of a US patient advocacy group for Canavan disease represents a good example of the social impact of gene patenting. This patient advocacy group for Canavan disease filed a lawsuit against the hospital and the researcher who patented a gene that is mutated in the degenerative disease. They claim that the gene was discovered using the genetic information and financial resources provided by the Canavan families, and that the hospital charged royalties that limited the availability of testing for the disease (Dennis and Gallagher, 2001).

Education

Genomic medicine is already making its way into health care settings where health care providers admittedly know very little about the underlying science of genetics or its role in human disease. Several surveys of genetics knowledge among health care professionals have shown that providers are frequently asked for information about genetics by their patients and that they are uncomfortable relaying such information (Fink and Collins, 1997). Unfortunately, most medical schools did not anticipate the changes that molecular genetics would bring to modern medicine. As a result, the ranks of medical geneticists are sparse, and many physicians struggle with the new biology. Furthermore, the nation's battalion of genetic counsellors has never grown to the size that would be needed in order to compensate for these deficiencies. As a result, doctors, nurses, and the public will have to do some work on their own to learn about the genes and genomes that will progressively change medical practice. Initiatives such as the National Coalition for Health Professional Education in the United States and the work of the Public Health Genetics Unit in the United Kingdom are leading the way in defining what primary care professionals need to know (Burton, 2002; Kavalier and Kent, 2003).

Predictive genomic medicine

The phrase 'predictive genomic medicine' symbolizes a type of genomic medicine, which proposes screening healthy individuals to identify those who carry alleles that increase their susceptibility to common diseases, such as cancers and heart disease. Physicians could then intervene even before the disease manifests and advise individuals with a higher genetic risk to change their behaviour (e.g. to exercise or to eat a healthier diet) or offer drugs or other medical treatment to reduce their chances of developing these diseases. However, predicting someone's risk of developing a common polygenic disorder also raises ethical, social and policy challenges that science alone cannot address. Population based genetic screening for a large number of susceptibility alleles are only socially and economically justifiable if physicians can follow up on a diagnosis of increased risk with an effective intervention to prevent this disorder. For some common cancers, such as colorectal and breast cancer, regular monitoring and early treatment have been shown to reduce mortality. Although preventive medications and other treatments exist, most interventions aimed at reducing disease risk still depend on the patient changing his or her behaviour. A question is raised: how to present and explain information regarding genetic risks for common disorders? Will giving individuals this information motivates them to change their lifestyle, such as quitting smoking or reduce their weight? Some researchers are concerned that inappropriate communication of risks may instead result in demoralization and reduce a person's self-confidence in their ability to change their health behaviour. Another concern is that screening will unnecessarily raise anxiety about disease risk in individuals who are found to have susceptibility alleles, but who are at low risk of developing the disorder (Hall et al., 2004). Knowing that one is at risk, even a small risk, could give way to 'genetic fatalism', whereby a person believes that his future health is only determined by genes, irrespective of changes to diets and behaviours (Dennis and Gallagher, 2001).

Conclusion

The pace of knowledge development related to genetics continues to progress exponentially. Knowledge gained through the human genome project will have a profound impact on the practice of medicine and on society. Genomic medicine holds the ultimate promise of revolutionizing the diagnosis and treatment of many diseases. Society on the other hand, is facing challenges, especially regarding the impact of genetic information (e.g. genetic information about mental illness) on the self-confidence of the individual, family relationship and stigmatization as well as discrimination in obtaining health insurance and in the work place. Government should set rules to protect the privacy and confidentiality of genetic information and to ban the use of genetic information in employment and health insurance

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THE COUNTERFEIT MEDICINES - A SILENT EPIDEMIC

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Counterfeit medicines range from products containing no active ingredients to those containing highly toxic substances. They can harm patients by failing to treat serious conditions; can provoke drug resistance and in some cases kill. . The latest estimates elaborated by WHO, show that more than 30% of medicines in some areas in Latin America, South East Asia, and Sub-Saharan Africa are counterfeit. In emerging economies, the proportion is estimated at 10% but in many of the former Soviet Union republics it can be as high as 20%. In wealthy countries, with strong regulatory mechanisms, counterfeit medicines account for less than 1% of the market value, but 50% of illegal internet sales are counterfeit.

The legal systems of most countries do not consider the counterfeiting of medicines a more serious crime than counterfeiting luxury items such as handbags or watches. Their laws are devised and designed mainly to protect trademarks rather than people's health. In some industrialized countries, counterfeiting t-shirts receives a harsher punishment than counterfeiting medicines. Some Internet pharmacies are completely legal operations, set up to offer clients convenience and savings. They require patient prescriptions and deliver medications from government licensed facilities. Other Internet pharmacies operate illegally, selling medications without prescriptions and using unapproved or counterfeit products. These rogue Internet pharmacies are operated internationally; they have no registered business address and sell products that have unknown or unclear origin.

Introduction

Over the past decade, the massive public health problem of counterfeit and substandard drugs has increasingly become apparent, causing a significant morbidity and mortality and reducing the effectiveness of healthcare in the developing world. There are few accurate estimates of the scale of the problem. Published estimates of the global prevalence of counterfeit drugs range from 1% to 50%. Since the pharmaceutical industries produce billions of tablets each year, even 1% of the global production would affect millions of people. Various countries use different definitions of counterfeit drugs .One of the most widely used is that of the W.H.O. where the emphasis is on the intent to deceive.

A counterfeit drug: is one which is deliberately and fraudulently mislabeled with respect to identity, source, or both Counterfeiting can apply to both branded and generic products and counterfeit products could include products with the correct ingredients or with the wrong ingredients, with out active ingredients ,with insufficient active ingredients, or with fake packaging.

Substandard drugs are genuine drug products that do not meet quality specifications set for them. If a drug, upon laboratory testing in accordance with the specifications it claims to comply with, fails to meet the specifications, then it is classified as a substandard drug.

Counterfeit and substandard medicines have a long history. In the first century in Greece, Dioscorides first classified drugs by their therapeutic use, warned of the dangers of adulterated drugs, and advised on their detection. Herbal medicines have a long history of being adulterated; for example the use of congeners to adulterate Valaerina officinalis root, used for treating cholera and red clay to adulterate the foul smelling Ferula ass-foetida, which was hung around the neck to ward off infections. Since of the discovery of potent anti-infectives there have been periodic crises in their quality .In the 17th century, the adulteration of Peruvian Cinchona bark, the first treatment of ague (malaria), with other astringent barks and aloes (assumed huge dimensions). This adulteration was precipitated by huge demands for the bark from Europe, where malaria was still endemic. In the UK, and USA in the mid-19th century, the widespread adulteration of medicine, especially quinine, prompted the first regulation of the trade in medicines, codes of practice of pharmacists and guides on the detection of counterfeit drugs. Counterfeit drugs were first addressed at an international health meeting only 20 years ago and the World Health Assembly adopted a resolution against counterfeit and substandard pharmaceuticals in 1988.

Numerous factors encourage counterfeiting drugs, apart from criminal greed. The relatively high cost of genuine medicines together with their desirability and shortage, gives the counterfeiters an economic incentive, facilitated by lack of legislation and enforcement and light penalties. There is often inadequate liaison between police, customs, and drug regulatory authorities. Lack of knowledge of counterfeits, and appropriate preventive measures, together with poor dissemination of information among health workers and the public, make their detection difficult. In the tropics many patients obtain medicines from untrained vendors without prescription, in inadequate courses, and without information. The lack of financial and human resources available to many drug regulatory authorities often makes effective recognition of poor quality drugs and actions impossible. Only 20% of WHO member states have well developed drug regulations and 30% have either no drug regulation or a capacity that hardly functions. Corruption is also an integral factor difficult to police, especially when the authorities are involved; for example, the staff of one drug regulatory authority were found to have taken bribes to pass spurious drugs for sale and drug inspectors were reported to charge wholesalers US$65 per month to allow their illegal businesses to continue. Complex trade arrangements, without proper documentation, facilitate trade in counterfeits across porous borders, resulting in a low risk, high profit venture for counterfeiters.

The consequences of

counterfeit and substandard anti-infectives

Morbidity and mortality

If medicines containing little or no active ingredients whether counterfeit or substandard are used for the treatment of common diseases with a high untreated mortality - e.g. falciparum malaria, pneumonia, meningitis, typhoid and tuberculosis, then morbidity and mortality must increase.

Adverse effects

Counterfeit and substandard medicines could also cause adverse effects through excessive dose, or due to the presence of potentially toxic ingredients or pathogen contaminants. Although such catastrophic results as the childhood deaths associated with the consumption of paracetamol syrup have not been reported for anti-infectives, potentially dangerous unexpected pharmaceuticals have been found in counterfeits, for example, counterfeit halofantrine syrup contains a sulphonamide and some counterfeit artesunate contains aremisinin, chloramphenicol, erythromycin, paracetamol, metronidazole and metamizole. Patients could be allergic to these drugs, or might experience adverse effects, which would be clinically very confusing, since the physicians would be unaware of the true active ingredients. The substitution of aspirin for chloroquine could contribute to acidosis in children presenting with severe malaria. Pathogens have been found in liquid formulations; substandard gentamicin eye drops in Mauritius were contaminated with gentamicin-resistant Pseudomonous aeruginosa and led to severe eye infections.

Economics

The financial consequences of counterfeit medicines for the companies producing the genuine product can be enormous. It has been estimated that the fake medicines market is worth some US$35-44 billion per year. Money is lost because the health care system, patients and their families must bear the costs of increased suffering and sometimes death. Spurious apparent resistance and unusual toxicities compound the public- health toll.

Loss of confidence

Loss of faith in genuine medicines is inevitable in areas where drug quality is perceived as being poor and results in a loss of confidence in the health care system and the drug regulatory authorities if action is inadequate. Health practitioners then also lose confidence in the medications that they rely upon.

Drug resistance

Anti-infective medicines that contain sub-therapeutic amounts of the active ingredients increase the risk of selecting and spreading of resistance. For diseases that are treated with combination therapy e.g. falciparum malaria, tuberculosis and HIV -poor quality drugs risk the spread of resistance due to both the poor quality and the “unprotected” co-drugs.

Chemical characterization of counterfeit medicines

Content and dissolution properties

The ability to investigate the contents of counterfeit or substandard pharmaceuticals is a critical component of monitoring of the drug supply by drug regulatory authorities. Chemical analysis methods such as high performance liquid chromatography (HPLC) and gas chromatography coupled with optical, electrochemical or mass spectrometric detectors have been the mainstays of the pharmaceutical analysis.

Inexpensive rapid tests

The quickest and cheapest way to detect counterfeit drug is to compare the printing, embossing, shape, odour, taste, and consistency of a suspected sample with the genuine product. In the 1840s, tablets were often adulterated with clay in Europe and the USA. An ingenious rapid test used, was to place the medicine on a shovel in a fire. Only 2% dry matter was left of the genuine tablet whereas the fake left 29% dry matter. Thin -layer chromatography (TLC) is a specific, sensitive and inexpensive technique.

Colourimetry identifies particular ingredients by making use of colour changes produced by chemical reactions or complexions between the active ingredients and a specific reagent. Quantitative measurements of active ingredient concentration as a function of colour intensity can then be made with a simple handheld photometer. Characteristic physical, chemical, and chemical properties e.g. weight, density, refractive index viscosity, osmolarity, PH, crystal morphology and solubility-can be also used to identify counterfeits. Microbiological technologies have also been used. For example, an antimicrobial activity assay of different ofloxacin preparations in Pakistan against three ofloxacin-sensitive reference bacterial species, showed that three injectable and one tablet brand had reduced or no antimicrobial activity.

Interventions

There is clearly no single solution to the problem of counterfeit medicines, but much more can be done now to control this enormous yet neglected problem that affects particularly the poorest, most vulnerable people.

Urgent support is needed for the 30% of the world’s countries that have no drug regulation or a capacity that hardly functions.

Good quality anti-infective medicines, with distinctive markers of quality assurance, should be readily available and inexpensive or free, to undercut the counterfeiters.

It should become a legal requirement to report any substandard or counterfeit drugs to the respective national drug regulatory authority, which in turn should report to the WHO. WHO should develop a centralized database that drug regulatory authorities and medical practitioners can consult for local current detailed information.

Monitoring for counterfeit rugs and substandard medicines should be an intrinsic part of disease surveillance programs.

Severe penalties commensurate with the severity of the crime are required for those who knowingly manufacture counterfeit medicines. Police and custom authorities should be mandated to regard counterfeit medicines with the same gravity accorded to narcotic production and distribution.

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ABSTRACT

Objective: To study the epidemio- This study examined the behavioral changes of children with Down syndrome through functional training (cognitive tasks and motor tasks). The training materials constituted of two types namely cognitive tasks and motor tasks. The subjects are also to be classified according to their mental level. Thus, the research study constituted 2*2 Factorial design.

THE EFFECTS OF INSTRUCTION AND AUDIOVISUAL TECHNIQUES ON BEHAVIORAL CHANGES OF CHILDREN WITH DOWN SYNDROME

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Introduction

Mental retardation is as an important research area of clinical psychology. Rehabilitation of mentally retarded individuals is one of the major goals of the therapeutic aspect of clinical psychology. Therefore, research in this area is theoretically and practically very much useful and relevant. Traditionally mental retardation is an incomplete mental development.

What is mental Retardation?

According to the new definition by the American Association on Mental Retardation (AAMR), an individual is considered to have mental retardation based on the following three criteria:

Intellectual functioning level (IQ) is below 70-75; significant limitations exist in two or more adaptive skill areas; and the condition is present from childhood. (defined as age 18 or less). (AAMR, 1992). " Mental retardation refers to sub-average general intellectual functioning which originates during the developmental period and is associated with impairment in adaptive behaviour " (Rick Rober, 1961).

Mentally retarded persons cannot adapt themselves adequately to their environment. To summarize mental retardation is an impaired mental ability. The legal definition is easy: " Everybody with an I.Q. lower than 70 or (in the main 75) on the Binet Scale is mentally retarded.

Down syndrome is the most common genetic (chromosomal) cause of mental retardation, caused in almost all cases by a third Chromosome 21. In addition to particular genetic and physical features, most children with Down syndrome display specific problems in linguistic grammar, expressive language, and articulation. For example, most children with Down syndrome do not progress grammatically beyond the 3-year level, and their grammatical abilities almost invariably fall below their overall mental age levels (Fowler, 1990). Similarly, skills in expressive language, as opposed to those in receptive language, are much more delayed. Indeed, by the time children's mental ages reach 24 months, significant delays (6+ months) in expressive language abilities are evident in 83% to 100% of children with Down syndrome (Miller, 1999). Regarding articulation, 95% of parents report that others show at least occasional difficulties understanding the speech of their child with Down syndrome (Kumin, 1994).

For the rehabilitation of mentally retarded persons and for their own self sufficiency and independence, it is very much necessary to train them through various types of tasks and materials. In short, psychology can contribute a lot for the rehabilitation of the mentally retarded.

In the present research, an attempt is made to measure the relative effectiveness of cognitive tasks in producing the behavioural change in mentally retarded individuals. The mentally retarded individuals here are Down syndrome boys and girls with high mental levels and low mental levels.

Over the past decade, a quiet transformation has taken place in behavioral research on persons with mental retardation. In earlier years, researchers compared persons with mild, moderate, severe, and profound levels of mental retardation. Recently, however, increasing numbers of studies have divided research groups by participants' etiology or cause of mental retardation. Comparing the 1980s to the 1990s, the numbers of behavioral studies increased from 10 to 81 for Williams syndrome, from 24 to 86 for Prader-Willi syndrome, and from 60 to 149 for Fragile X syndrome. Even for Down syndrome, the sole disorder with a long-standing tradition of behavioral research, the number of behavioral studies almost doubled, rising from 607 articles during the 1980s to 1,140 articles during the 1990s (Dykens & Hodapp, 2001).

Method

In this research study, observational method was used. It was a pre-planned structured observation. This is the primary technique of collecting data.

Observation was taken in a natural environment of the mentally retarded institute. The subjects with High mental level HML and Low mental level LML were taught through two types of task.

(1). Cognitive task

(2). Motor task

Training was done in a semicircle of subjects, then their retention as a measure of behavioural change, was measured.

Sample:

For each type of task, 30 (male subjects) and 30 (female subjects) were selected purposively from the

mentally retarded institution, situated in Tehran city. The subjects with HML and LML are distributed equally for both the types of task for training purposes. Thus each group consisted of 15 HML individuals and 15 LML individuals.

Collection of Data:

The present research study was conducted in two parts: Firstly, for 6 days various motor tasks and cognitive tasks were taught to the mentally retarded Down syndrome subjects through verbal instructions and secondly, the retention as a measure of behavioural change was measured on the 7th day, after giving 24 hours rest period for the consolidation of the learnt association.

Design:

The design of the present research study is a separate group design with 2* 2 factorial design as described in

Table No: 1.

Types of task	High mental Level B1	Low mental Level B2
Cognitive Task A1	15	15
Motor – task A2	15	15

Variables:

Independent variables:

1). Types of task.

a). Cognitive - task.

b). Motor - task.

2). Mental level.

a). High mental level (HML).

b). Low mental level (LML).

Dependent variables:

(1). Behavioural change measured as the retention score of test - score.

Controlled variables:

1. 6 days training was given for proper exposure.
2. Rest period of 24 hours was given for the consolidation of the learnt association.
3. Tasks were selected and modified according to the Persian speaking population.
4. The number of subjects were equal in each cell.

1. Tools:

The tools used in this study consist of various cognitive tasks and motor tasks. Each task is defined through five units and until wise one score is given. Thus each task would have a maximum score of five and minimum of zero.

In this way, various types of task were taught to the mentally retarded individuals and after that the retention score for each subject was calculated. The various types of task selected according to the mental level (ML) of M.R are as follows: ……

For Mildly Retarded.

Cognitive - task.	Motor - task.
1). Name body parts	1). Combing hair.
2). Money concept	2). Washes hand and face.
3). Geometrical	3). Threads a Needle drawings

For severely Retarded.

Cognitive - task.	Motor - task.
1). Self concept.	1). Brushing teeth.
2). Colour concept.	2). Use fingers to
3). Name 5 common pick up objects. animals	3). Jumping & running.

Theoretical Framework.

Pratap L.(1977) stated that in the education of the mentally retarded children, there are three distinct and important phases which need to do clearly understood: They are home-training, schooling and rehabilitation. The school is the must to bridge the gap between the home and community. The school therefore, is expected to offer a type of education, which prepares the mentally retarded children to move into society. Special education has to be different from normal school education. Teaching the mentally retarded children is a highly challenging task, where some concrete and substantial results are expected to be seen in those taught.

Recently it has been indicated that mentally retarded individuals are passive; they cannot act properly or correctly, (Ferretti & Cavalier, 1991). Despite this inability, training can help them to learn how to use appropriate strategies, (Arthur. J. Baroody. 1996).

But methods of training have an important bearing in this matter.

Maximum cognitive development levels of mild mentally retarded children are concrete and to operational level.

So it is evident that using concrete methods on one hand and multi-sensory methods for overcoming their attention deficit on the other hand, can be very useful.

The researcher also believes that high-level functions without automisation of low-level functions have limitations and have some deficit in automatic processing. The subjects will have problems in performing high level skills, (Edward C. Merill, 19969). But investigations, believe that function can be automised by extensive stimulus and that in which each stimulus has its own response. (Negative or positive).

So automization of processing various tasks can lead to high level of functions in these children. This research, with regard to Piaget's opinion on one hand and the recent approaches to mentally retarded learning characteristics on the other, will consider the effectiveness of two methods in learning tasks.

The researcher plans to understand the change in behavioural patterns in the case of the mentally retarded after a certain period of actuate training.

This way the study is targeted to evaluate the method of training the mentally retarded through two types of task.

(1). Cognitive tasks &

(2). Motor tasks.

Skill training is one of the major areas of training mentally retarded individuals.

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IATROGENIC HYPOGLYCEMIA AFTER INTRAARTICULAR INSULIN ADMINISTRATION

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Key words: hypoglycemia, insulin

Introduction

Iatrogenic hypoglycemia causes recurrent morbidity in most people with type 1 diabetes and in many with type 2 diabetes, and it can sometimes be fatal (1). While the clinical presentation is often characteristic, particularly for the experienced individual with diabetes; the neurogenic and neuroglycopenic symptoms of hypoglycemia are nonspecific and relatively insensitive; therefore, many episodes are not recognized (1,2). Hypoglycemia can result from exogenous or endogenous insulin excess alone. In insulin-deficient diabetes (exogenous) insulin levels do not decrease as glucose levels fall, and the combination of deficient glucagon and epinephrine responses cause defective glucose counter-regulation (1,3). Furthermore reduced sympathoadrenal responses cause hypoglycemia unawareness and reduced neurogenic symptom responses to a given level of hypoglycemia. The absolute or relative insulin excess, whether from injected or from secreted insulin, is the sole determinant of risk factor of iatrogenic hypoglycemia. Although each must be considered carefully, these conventional risk factors explain only a minority of episodes of severe iatrogenic hypoglycemia (4). Obviously, one cannot solve the problem of iatrogenic hypoglycemia if it is not recognized to be a problem.

Here we report a patient presenting with hypoglycemia after an exceptional way of insulin administration. A 68-year-old woman with a history of 10 years of insulin-treated diabetes was hospitalized after an episode of disorientation. She was taking 10 units of NPH insulin at 8 AM and 6 units at 7 PM, subcutaneously. She had an 8-year history of hypertension controlled by low-salt diet and ACE inhibitor daily. She had had transient ischemic attack three years earlier. Neurologic and ophthalmologic examinations were unremarkable other than a lethargic state. Her blood pressure was 150/90 mmHg. Otherwise physical examination was normal. Laboratory studies demonstrated a blood glucose level of 25 mg/dL. ECG was normal, so glucagon of 1 mg/sc was injected. Thereafter, bolus of 100 ml 50% dextrose was given intravenously, followed by a constant infusion of 5% dextrose. During the next 30 minutes, she gradually became alert but after one hour she again became lethargic and her speech was slurred. Her blood glucose was 32 mg/dL before the administering a bolus of 50% dextrose again. Her mentation cleared immediately and neurologic signs disappeared. A control CT of the brain was normal. She constantly complained of getting worse after a visit to her physical therapist during her follow-up. When her physician was contacted; he admitted that a 300 IU NPH insulin was administered intraarticulary to her left knee in order to eliminate her gonoarthrosis symptoms. So we followed her for another 48 hours and discharged her with blood glucose level of 180 mg/dL

In conclusion, the determination of hypoglycemia etiology sometimes might be difficult. It is very important to obtain the patient's history in detail.

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GLUCOSE MONITORING FOR EFFECTIVE THERAPY OF DIABETES IN OFFICE MEDICAL PRACTICE

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Key Words: diabetes, glucose monitoring, glucose meters, continuous monitoring

ABSTRACT

Diabetes mellitus is a chronic, costly, and increasingly prevalent disorder that carries a huge burden of complications. Blood glucose monitoring is critical to achieving glycemic goals and standards of care. An integral part is self-monitoring with glucose meters that are user-friendly and accurate while minimizing patient discomfort. Minimally invasive continuous monitoring is available for physician-directed retrospective review of 3 days of data, while a subcutaneous sensor that transmits frequent readings to be viewed on the screen of an insulin pump in real time has recently been launched. Graphs and trends of blood glucose with the help of software that analyzes and reports them through meter downloads and sophisticated data management features provide valuable feedback regarding the state of glycemia. The development of completely noninvasive blood glucose monitoring promises to aid in configuring a 'closed-loop' system that delivers insulin in a semi-automated fashion. Ongoing research and its translation to the bedside through the proper education and training of both clinicians and patients will be the key to successfully harnessing these exciting technological advances for optimizing diabetes care in the future.

Introduction

The prevalence of diabetes has witnessed a relentless increase in modern times, accompanied by its enormous toll in complications and cost[1]. Attainment of optimal glucose targets by monitoring of daily, monthly, and long-term glycemic control is an integral part of an effective strategy to improve diabetes management. The field has witnessed remarkable advances in the ease and accuracy of glucose monitoring techniques recently in order to assist in improving diabetes management. The American Diabetes Association (ADA) standards of care [2] include parameters pertaining to both self-monitored blood glucose and glycosylated hemoglobin (HbA1c) (Table1). This provides valuable feedback on the effectiveness of treatment and guides the clinician and patient in making appropriate daily and long-term adjustments with the ultimate aim of sustaining optimal glycemic control.

Self-monitoring of blood glucose (SMBG)

Recent research that points to glycemic variability as a risk factor for endothelial dysfunction, oxidative stress, and vascular complications independent of the HbA1c level[3]. The new paradigm is to aim for blood glucose concentrations in persons with diabetes as close to those found in non-diabetic individuals as is safely possible. The frequency and timing of SMBG should be dictated by the particular circumstances, needs and goals of the patient. The ADA's Consensus Statement[4] list the following indications for SMBG: (a) achieving and maintaining glycemic control (b) preventing and detecting severe hypoglycemia (c) avoiding and treating episodes of significant hyperglycemia (d) adjusting to changes in lifestyle, and (e) determining the need for initiating insulin therapy in gestational diabetes mellitus. SMBG allows patients to evaluate their individual response to therapy, assess whether glycemic targets are being achieved, and can be useful in preventing hypoglycemia and adjusting medication doses. This becomes crucial when intensive insulin regimens with multiple-dose injections or pump therapy are employed.

Clinical studies reveal that SMBG is performed by patients much less frequently than recommended [5]. For type 1 patients, SMBG is recommended three or more times a day, especially when tight control is the aim[4]. The optimal frequency of SMBG for patients with type 2 diabetes on oral agents should be sufficient to facilitate reaching glucose goals; twice daily or more frequent monitoring may be desirable in patients treated with sulfonylureas, other secretagogues, or insulin, particularly when therapy is initiated or changed[4]. To achieve postprandial glucose targets, SMBG 2 hours after meals (one hour post-meal in gestational diabetes) is appropriate[6]. Routine evaluation of the patient's technique and ability to use data to adjust therapy is recommended.

Accurate and user-friendly meters for home use provide the autonomy and flexibility of checking glucose levels with minimum hassle and discomfort. The worldwide market for glucose monitors is $2.7 billion per year, with annual growth estimated at 10–12%[7]. At least 25 different meters are commercially available [8]; however, a large variability in their performance exists because many factors can interfere with glucose analysis. Only half of all analyses meet the ADA criterion of <5% deviation from reference values[9].

The accuracy of SMBG is both instrument- and user-dependent. Several technologic advances that decrease operator error in the last few years include "no touch" technique, "no wipe" strips, timing when both the sample and the strip are in the meter, smaller sample volume requirements, an error signal if sample volume is inadequate, barcode readers, and the ability to store up to several hundred results in memory. Together these improvements have led to superior performance by new meters. Patients

should be instructed in the correct use of glucose meters and their monitoring technique evaluated at regular intervals[10]. Optimal use of SMBG also requires proper interpretation of the data. Patients should be taught how to use the information to adjust food intake, exercise, or pharmacological therapy to achieve specific glycemic goals. Ongoing education at clinic visits, comparison of SMBG with concurrent laboratory glucose analysis, and home practice with meters improves the accuracy of patients' blood glucose results[11].

Alternate site testing (AST) may be useful in reducing the number of fingertip tests, reduce discomfort, and enhance the acceptability of self-monitoring in patients who check several times a day [12]. Not all glucose meters are approved for AST, although this feature is rapidly becoming a standard feature in most meters. The forearm is the usual site for AST and has been studied the most. The Advance Micro-draw System (Hypoguard USA, Inc.) received clearance from the Food and Drug Administration (FDA) for drawing a blood sample from the palm for measuring blood glucose, which may be a less painful site for testing than, but correlates well with, the fingertips. Studies show good correlation of forearm readings with results from fingertip checks in the fasting state. After meals, however, the fingertip readings tend to be higher than the forearm, where blood flow is slower. The fingertip is the recommended place for testing when accuracy is important, as in suspected hypo- or hyperglycemic situations. AST in the hypoglycemic range may potentially give misleading results.

Monitoring times merit comment (Table 2). Pre-meal measurements are needed to adjust the basal insulin dose and in determining the dose of short-acting insulin prior to meals in patients who use multiple-dose, flexible insulin regimens. Two-hour post-prandial readings are important to assess the level of post-meal hyperglycemia, and serve as a verification of meal coverage when a short-acting oral secretagogue or rapid-acting insulin is used. After fine-tuning of the insulin dose at mealtimes has been achieved, post-prandial monitoring should continue to be performed periodically but less frequently. The bedtime check is helpful in determining the efficacy of the dinnertime dose of insulin, and as a key safety component in preventing nocturnal hypoglycemia. A blood glucose test between 2 to 4 am once or twice a week can identify episodes of unrecognized nocturnal or overnight hyper- or hypoglycemia and is an important part of adjusting long-acting insulin dosage or the basal insulin rate during pump therapy. Importantly, blood glucose should be checked if symptoms of hypoglycemia are present, illnesses that can affect glucose control are present, and prior to driving and physical activity.

In spite of the availability of meter memory and download capabilities, maintaining a written log of blood glucose readings is very important. This enables the patient and the provider to look at various relevant parameters (like notes on food intake and timing, activity, stress, etc.), as well as trends of the readings over many days, weeks, or months, in order to facilitate necessary therapeutic adjustments (Figure 1).

The choice of a meter is influenced by patient preference, cost, insurance coverage, and physician recommendations. Certain unique meter characteristics may lend themselves to preferred usage by a particular patient. For example, meters may have a user-friendly design, single-strip system with no coding or calibration requirements, require a small blood sample size, have a quick 5-second result time, provide the option of alternate-site (forearm) testing, have electronic logbook or data download capabilities, show trend graphs on the screen, send glucose readings automatically to an insulin pump, or be able to organize readings into before-meal and after meal times for showing relationship of glucose to food intake. Certain 'talking" meters providing audible glucose reports, while voice-prompts can guide the visually-impaired step-by-step through the testing sequence.

Meter memory and data management systems

The capability of storing blood glucose values that can be accessed by scrolling back is a convenient feature of many glucose meters. However, even though the readings give dates and times, it is difficult to assess a pattern and make appropriate treatment changes based on the scroll-back memory feature alone. Downloading data into a computerized database far pattern analysis and long-term storage is intended to circumvent this hurdle. These data management systems can store hundreds of test results and information such as time, date, insulin or medication types and doses, meals, and exercise times. Different time-segments can be designated as 'fasting', 'pre-meal', or 'postprandial' and the computer will group the readings into these categories for ease of analysis. It may be helpful to display or observe the SMBG results in one of the various graph or text formats or as a14-day summary provided by these computer software systems (Figure 2). Some blood glucose meters also have the capability of built-in data analysis and can display glucose averages, day graphs, and other helpful patterns; patients can detect trends in glycemic values and thus participate more actively in their own care. The MiniMed Solutions Software (Medtronic MiniMed, Northridge, California, USA) can integrate blood glucose values from the Paradigm Link meter with various parameters of insulin pump therapy – like amount of carbohydrates consumed and boluses of insulin given by the patient – thus assisting in fine-tuning of pump settings.

Minimally invasive continuous glucose monitoring (CGM)

Despite the phenomenal advances in blood glucose meter technology, self-monitoring as it currently exists has real and inherent limitations. Fingerstick testing shows a snapshot of the glucose level at a single point in time, representing the sporadic measurement of a continuous and changing variable. It does not give an idea of the degree and direction of change in glucose. With more frequent or continuous monitoring, information

can be used to adjust treatments in a more measured, anticipatory, and meaningful manner, thus safely intensifying control[13]. The downsides include having to learn, navigate, and troubleshoot the new devices, the need for educating providers and patients, increased cost, "information overload", and the imperfections of the nascent technology itself.

The Continuous Glucose Monitoring System Gold (Medtronic MiniMed, Northridge, CA) has the advantage of providing very frequent glucose readings – up to one every 5 minutes or 288 readings a day for 3 days at a time. A tiny sensor is inserted just beneath the skin of the abdomen for 'continuous' recordings that can be downloaded and retrospectively analyzed. Patients can note events like insulin administration, meals, and exercise times. It can be helpful in giving the clinician a more 'complete' picture and pick up unsuspected periods of glucose peaks and lows, uncover nocturnal hypoglycemia, detect hypoglycemia unawareness, and show glycemic elevations as in the post-prandial state or the dawn phenomenon[14] (figure 3). The Guardian RT can sound an auditory or vibratory alarm for both hypo- and hyperglycemia in real-time according to a preset glucose range[15]. The increased realization and emphasis on the benefits of tight glycemic control in hospital patients, especially in critical care, the peri-operative period, and cardiac bypass surgery, has spurred the development of continuous blood glucose recording in the inpatient setting[16] although none are approved or available for clinical use yet.

The MiniMed Paradigm REAL-Time System (Medtronic Minimed, Northridge, California, USA), which consists of two components: a continuous glucose monitoring system and an insulin pump (figure 4). A sensor, inserted under the skin by the patient and replaced every three days, measures interstitial fluid glucose. A recent advancement is the MiniLink sensor that is smaller and runs on rechargeable batteries. A transmitter then sends this information to an insulin pump (the Paradigm 522 or 722 brands) where it is displayed on the screen as a real-time glucose value as well as 3-hour and 24-hour trend graphs. The device can be programmed to trigger an alarm for readings outside the desirable range – both hyper- and hypoglycemia – that can be confirmed by a fingerstick test. Glucose trends can be spotted and anticipatory steps taken in order to prevent glycemic excursions. It is hoped that this 'sensor-augmented' insulin pump may prove to be a prelude to completely noninvasive glucose sensing coupled with automatic insulin delivery – a closed-loop system that may function as a true 'artificial pancreas'.

The DexCom STS (DexCom Inc, San Diego, California, USA) is a patient-insertable sensor that transmits blood glucose readings wirelessly to a hand-held receiver. A long-term sensor (LTS) is available for subcutaneous implantation as an outpatient procedure under local anesthesia.

Tests of average glycemia

The hemoglobin A1c (HbA1c) test enables health providers to ascertain a patient's average glycemia over the preceding 2–3 months and thus assess treatment efficacy. It should be performed routinely in all patients with diabetes in order to document the degree of glycemic control at initial assessment and subsequently as part of continuing care. It is recommended that the HbA1c test be done at least two times a year in patients who are meeting treatment goals (and who have stable glycemic control) and quarterly in patients whose therapy has changed or who are not meeting glycemic goals[2]. Note that glycemic control is best judged by the combination of the results of the patient's SMBG testing and the HbA1c; the two complement each other. Point-of-care HbA1c testing with rapid turn-around in the office has been shown to be effective in making interventions, changing therapies, and improving general management strategy immediately in the ambulatory setting [17]. Physician-patient discussions regarding treatment changes can be done face-to-face and more efficiently without an unnecessary delay in instituting adjustments (figure 5). Several home HbA1c test kits, most requiring mail-in for results, are also available.

Due to its shorter half-life, glycated serum fructosamine provides an index of glycemic control over the preceding 10-14 days. This test gives two-week averages of blood glucose by measuring the glycosylation of the blood proteins albumin and globulin, and thus provides a clue to recent, short-term glycemic control[18]. This test may be useful during pregnancies, in the presence of hemoglobinopathies and hemolytic anemias, and for the short-term evaluation of therapeutic interventions.

GlycoMark is an FDA-approved blood glucose testing system that is purported to bridge the gap between fingerstick monitoring and HbA1c by measuring levels of the compound 1,5-anhydroglucitol. It is marketed as a test of short-term to intermediate glycemic control, reflecting predominantly post-meal glucose excursions[19]. As an index of postprandial hyperglycemia, GlycoMark should prove useful as treatment targets are lowered and management of post-meal glucose spikes becomes increasingly important.

What the future holds: noninvasive continuous monitoring

The science of glucose monitoring has seen vast improvement s in the past decade, helping patients and providers to implement intensive control with the promise of reducing the burden of diabetes-related morbidity and mortality. It is hoped that the next breakthrough in this area will be the advent of completely noninvasive testing that is risk-free, accurate, convenient, and affordable. In addition, for insulin-treated patients, a feedback system based on the latest monitoring technology to calculate and automatically deliver the appropriate amounts of insulin will be a major and exciting therapeutic advancement. Maintaining excellent glycemic control through minimizing day-to-day glucose variations seems to be the standard of care for diabetes management for the future. With the current state and pace of technological progress, this goal appears more achievable than ever before.

Table 1. *Summary of recommendations for adults with diabetes*

Glycemic control - AIC	<7.0%
Preprandial plasma glucose	90–130 mg/dl
Postprandial plasma glucose	<180 mg/dl
Blood pressure	<130/80mmHg
With nephropathy	< 125/75mmHg
Lipids	
LDL	<100 mg/dl
Patients above age 40 years	statin therapy to achieve LDL reduction of 30-40%
In overt CVD	LDL goal of <70 using high-dose statins "is an option"
Triglycerides	<150 mg/dl
HDL	>40 mg/dl

Key concepts in setting glycemic goals:
Goals should be individualized.
Certain populations (children, pregnant women, and elderly) require special considerations.
Less intensive glycemic goals may be indicated in patients with severe or frequent hypoglycemia.
More stringent glycemic goals (i.e. a normal A1C, <6%) may further reduce complications at the cost of increased risk of hypoglycemia (particularly in those with type 1 diabetes).
Postprandial glucose may be targeted if AIC goals are not met despite reaching preprandial glucose goals.

Adapted from American Diabetes Association: Clinical Practice Recommendations 2007. Standards of medical care in diabetes. Diabetes Care. 2007;30(Suppl 1):S4-S41. Available at http://care.diabetesjournals.org/cgi/content/full/30/suppl_1/S4, accessed 4-20-07.

Table 2. *Recommended times for Self Monitoring of Blood Glucose (SMBG).*

	Reading Time	Rationale
1.	morning or pre-breakfast	adjust basal therapy
2.	before meals	calculate bolus insulin
3.	bedtime	adequacy of dinner treatment and nocturnal safety feature
4.	90-120 minute post-prandial	assess post-meal glycemic elevations
5.	2 - 4 am	overnight control, dawn phenomenon, nocturnal hypoglycemia
6.	suspected hyper- and hypoglycemia	early detection
7.	prior to driving	detect/treat hypoglycemia and road safety
8.	before, during, and after exercise	prevent hypoglycemia
9.	during sickness	assess blood glucose, institute appropriate therapy

Figure 1. *Example of a Self-Monitored Blood Glucose (SMBG) Flow Sheet that patients can periodically fax or mail to the office.*

Fax Date_____ Attention Dr._____ Nurse_____
Patient name_____DOB_____Patient's phone _____ Current medication or insulin dose _____
BG Targets: pre-meal_____ post-meal_____ Carb ratio_____ Supplemental Factor_____ (if applicable)

Date	12 am	3 am	before bkfst	after bkfst	before lunch	after lunch	before supper	after supper	bedtime	other times	Comments

Figure 2. *Meter Download into a Data Management System displaying a 14-Day Summary Log Book, Graph, and Pie Chart of glucose patterns.*

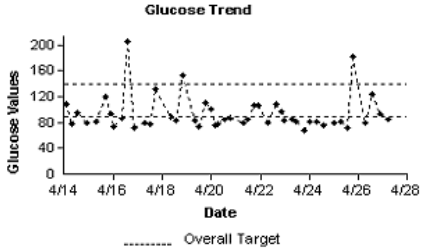
Age/Gender: **Units:** mg/dL (Plasma)
Date Range: 4/14/2005 - 4/27/2005 **Doctor:**

Date	Breakfast					Lunch					Dinner					Night		
	Bef.	Aft.	Meds	Carb	Ex	Bef.	Aft.	Meds	Carb	Ex	Bef.	Aft.	Meds	Carb	Ex	Gluc	Meds	Carb
4/27/2005	***86***																	
4/26/2005	***79***					***123***						93						
4/25/2005	***81***					***72***					***182***							
4/24/2005	***81***					***76***										***80***		
4/23/2005	***86***					***82***					***68***					***81***		
4/22/2005	***79***					108					96					***83***		
4/21/2005	***79***					***86***					107					106		
4/20/2005	***78***					***86***					***87***					***75***		
4/19/2005	***83***					***74***					110					101		
4/18/2005	90					***84***					***152***							
4/17/2005	***80***					***78***					***132***							
4/16/2005	***87***					***206***					***77***							
4/15/2005	***82***					***120***					92					***73***		
4/14/2005	***78***					94					***80***					109		
Average	82	0				99	0				107	93				89		
In Target	7%	0%				15%	0%				36%	100%				38%		
SD	4	0				36	0				35	0				14		
#Results	14	0				13	0				11	1				8		

Results shown in bold italics are out of range.

Statistics

Glucose Average:	94	Target Type:	Personal
% Within Target:	23	Before Meal Target:	90 - 110
# of Glucose Readings:	47	After Meal Target:	90 - 140
# of Hypo. Readings:	0	Hypoglycemic:	67
Standard Deviation:	27	Avg. Readings/Day:	3.36



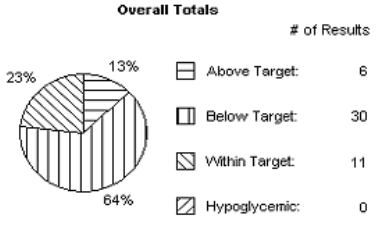
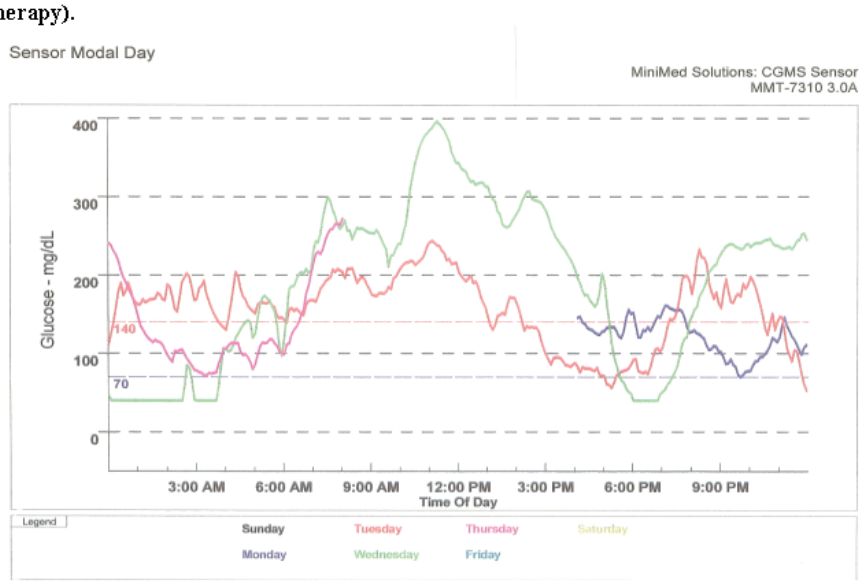


Figure 3. *Blood glucose recordings of a patient before and after initiating insulin pump therapy using the Continuous Glucose Monitoring System (CGMS) Gold.*

A) On twice daily pre-mixed insulin injections (before pump therapy).



B) After initiation of insulin pump therapy.

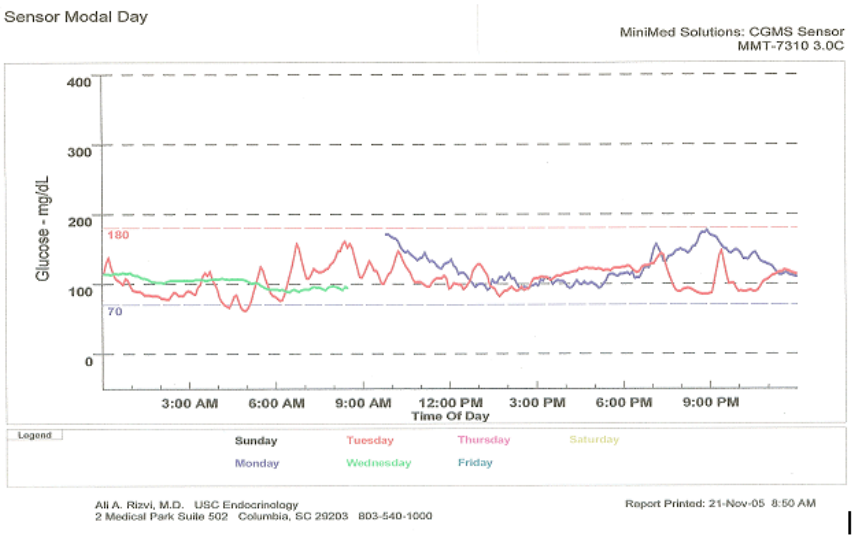


Figure 4. *The MiniMed Paradigm REAL-Time Insulin Pump and Continuous Glucose Monitoring System.*

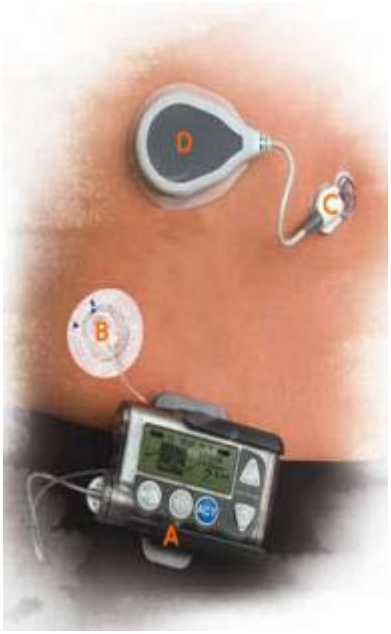


Figure 5. *The Bayer DCA 2000+ Analyzer for Point-of-Care Office Measurement*

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SMOKING CESSATION ATTEMPTS AND THEIR OUTCOME AMONG ADOLESCENTS WHO EVER SMOKED IN TABOUK AREA, SAUDI ARABIA

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Key words: Cigarette smoking, cessation patterns, students, Tabouk, Saudi Arabia.

ABSTRACT

The objectives of this study are to describe patterns and factors associated with smoking cessation attempts and their outcome in adolescents in Tabuk city, Saudi Arabia. A cross sectional survey was carried out using a self-administered questionnaire on smoking habits and smoking cessation. The setting was general education schools in Tabuk city, Saudi Arabia. Subjects of the study were: Male and female students aged 12-25 years who ever smoked. Outcome measures were: Smoking cessation attempts and their outcome, as defined by smoking status: currently smoking or currently not smoking for at least the past 30 days. The sample included 1505 students of whom 657 (43.7%) were ever smokers and of those 134 (20.4%) never attempted quitting and those differed significantly from smokers who attempted quitting in intensity of smoking, attitudes towards smoking and exposure to environmental tobacco smoke (ETS) at home and public places. Of the 520 smokers who attempted quitting 321 (61.4%) were classified as quitters as they were not smoking for at least 30 days prior to date of study. Univariate analysis showed that quitters differed significantly from non-quitters in intensity, attitudes towards smoking and ETS at home and public places. Discriminant analysis showed that continuing smokers, smoke more cigarettes daily and have more smoking friends.

Cigarette smoking is prevalent among adolescents in Tabuk. The majority of smokers attempted to quit and failure is associated with intensity, smoking contacts and positive attitudes towards smoking. These factors need to be considered in antismoking activities.

Introduction

Health education programs, mass media campaigns and nowadays even the slogans depicted on cigarette packages, warn smokers about the harmful effects of smoking. Despite all these efforts people continue to smoke1-3. Smoking among adolescents is on the increase worldwide and particularly in developing countries including rich developing countries such as the Kingdom of Saudi Arabia. Smoking surveys in the Middle East showed that smoking prevalence among young people ranged from 7% in Oman to 53% in Lebanon with 25% in Saudi Arabia4. Prevalence of smoking among adolescents appears to be rising, with more children and adolescents becoming regular users of tobacco each day. It has been estimated that 15% – 30% of Saudi adolescents smoke. Expenditure on tobacco imports is a significant burden on economic development. Saudi Arabia currently imports 20,000 million cigarettes per year, which costs $351.8 million4. Serious complications of smoking usually occur later in adult life but even at youth age there are numerous adverse health conditions caused by tobacco use including reductions in the rate of lung growth and in the level of maximum lung function, increase in the number and severity of respiratory illnesses and unfavorable effects on blood lipid levels5. In Saudi Arabia cigarette smoking was the main risk factor for acute myocardial infarction in young age patients6. Evidence shows that four out of every five persons who use tobacco begin before they reach adulthood, becoming addicted early, making them less able to quit and more likely to be affected by a tobacco-related health problem7. The longer the onset of smoking behavior is delayed, the less likely the person is to become addicted. Once addiction occurs, however, nicotine dependence is extremely difficult to break. Hence it is of paramount importance that tobacco-preventing activities should focus on school-age children and adolescents to reduce future smoking-related illness and associated costs. The literature on smoking cessation among the population of adolescents is sparse and very little research has focused on the problem of teenage smoking cessation. Better understanding of the problem of cessation is needed to provide an empirical basis for the development of effective programs that encourage teenagers to quit smoking.

The general aim of this study is to provide baseline information regarding tobacco cessation patterns and factors associated with smoking quitting attempts and their outcome. To the authors best knowledge this is the first study of its nature and scope to be conducted in Tabuk area in Northern Saudi Arabia with the intention of utilizing the generated information in designing, implementing, monitoring and finally evaluating a comprehensive tobacco control program including cessation strategies.

Methods

This is a cross-sectional school-based study in Tabouk Governmental schools with grades 7 through to 12 (intermediate and secondary schools), corresponding to age 12 to19 years. This was preferred to the household survey because it is logistically easier, cheaper, and gives more freedom for students particularly females to express their habits and views away from family pressure. Two-stage stratified

cluster sampling method was used. All public schools consisted of grades 7 to 12 in Tabouk city and were placed firstly in two categories according to school level (Intermediate schools and Secondary schools). Secondly, each category was stratified into two categories according to sex. In the first stage 16 schools were randomly selected proportional to the enrolment size (four schools from each of the four categories: 4 intermediate boys, 4 intermediate girls, 4 secondary boys and 4 secondary girls. In the second stage, 3 classes were randomly chosen from each of the 16 schools, one from each grade. This yielded 48 classes with 1,566 students all of whom were included in the study. The mean class size for the whole group was 33 students and there were no obvious differences between male and females in this respect.

The study tool used was an anonymous, pilot tested, self-administered questionnaire consisting of 56 questions, with core items selected from Global Youth Tobacco survey items (Arabic version). The Questions were grouped into categories relating to tobacco use, prevalence of tobacco use, access to tobacco, knowledge and attitude toward smoking, attitude toward cessation of smoking, exposure to environmental tobacco smoke, exposure to tobacco related advertisements in media, and education on tobacco and smoking in school.

Questionnaires were distributed during the mid-morning classes to avoid eliminating students arriving late and also to avoid lunchtime. The collection of data was conducted under the supervision of health care workers in schools in the absence of any school teacher or any other school personnel. Confidentiality was assured (written and verbal) and that data will be used only for the stated research purposes.

The heath workers were responsible for the delivery and collection of all the survey documentation forms and for reporting the number of students not attending class on the date of the survey, or refusing to participate in the survey. Completed questionnaires were collected and checked manually for completeness and then entered into a personal computer and analyzed using SPSS package version 11.5. Descriptive analysis was performed to compare between the two sexes. Statistical associations between current smoking status and study variables were tested with chi-squared distribution. The level of significance was set at $P < 0.05$.

Definitions

The following definitions were used to characterize the smoking status. Ever smoker: any student who had ever smoked cigarettes, even one puff.

1. Current cigarette smoking: having smoked on one or more days in the 30 days preceding the survey.
2. Ex-smoker: ever smoker who had not smoked in the 30 days preceding the survey.

Results

Of the total 1,505 students who completed the questionnaires (98% response) 657 (43.7%) were ever smokers. Of the ever smokers 523 (79.6%) tried seriously to quit and the rest (134 – 20.4%) never attempted to quit. About 70% had more than two attempts. The most important reason for attempting quitting was health concerns in 62.4%, family pressure for 23.9%, friends' pressure for 6.3% and only 2.4% to save money. A quarter of the smokers self initiated their quitting attempt. The majority had assistance from family (36.4%), or from friends (22.1%) and less than 17% from antismoking programs. Table 1 shows characteristics of these two groups (who did not attempt and who attempted quitting) Smokers who did not attempt to quit tend to smoke more cigarettes, buy their cigarettes, have positive attitudes towards smoking and were more exposed to tobacco environmental smoke in homes and public places. Of all ever smokers who attempted to quit 321 (61.4%) were successful so far (ex-smokers) for cessation periods ranging from one month to three years. Less than 7% (36 smokers) tried seriously and were successful initially but relapsed and 166 (31.7%) smokers tried and were completely unsuccessful. So at the time of the study of all ever smokers 321 (48.9%) were not currently smoking (quitters/ex-smokers) and the remaining 336 (51.1%) were continuing smoking (current smokers).

Table 2 shows data on personal characteristics of current smokers and ex-smokers. A significant difference was observed for age when first tried cigarettes, pocket money and whether parents smoke. Those with more pocket money (> 20 SR) (OR = 14.27), with parents who both smoke (OR = 1.86), father only smokes (OR = 1.39), mother only smokes (OR = 1.67) and those with elder age (> 15) when they first tried smoking (OR= 1.54) are more likely to continue smoking. Table 3 shows attitude and practice of current smokers and ex-smokers. A significant difference was detected for smoking is harmful to health, number of friends who smoke, idea of one who smokes, exposure to smoking from others at home or in public places, those who own something with a cigarette logo in it and feeling more or less comfortable when smoking at celebrations or social gatherings. Those who think smoking is not harmful to health (OR = 1.89), with some friends (OR = 2.32) or all friends smoke (6.43), who think positively of smoking (OR = 3.57), those who were less exposed to smoking either at home (OR = 1.79) or in public places (OR = 2.39), those with something with a cigarette logo on it (OR = 1.85) and those who feel more comfortable when they smoke at celebrations or social gatherings (OR = 2.44) are more likely to continue smoking.

The results of the stepwise discriminant analysis are shown in Table 4. Wilks' lambda, as a test of discriminant function was highly significant (Wilks' lambda = 0.407; (2 = 593.6). In total the model classified 82.8% of the students included in the sample. Specifically, the model classified 76.3% of students continuing smoking and 88.5% of ex-smokers. The standardized coefficients indicate the relative importance of the discriminating variables in predicting the dependent variable. Based on magnitude of the standardized coefficients, number of friends who smoked, smoking parents, number

of cigarettes smoked, smoking from others at home, idea from one who smokes, smoking harmful to health, and age when first tried cigarettes made the largest contribution when discriminating between smokers and ex-smokers. The positive signs of the coefficients for number of cigarettes smoked and number of friends who smoke, indicates that students with more friends who smoke and smoke heavily are more likely to continue smoking. The negative sign for the coefficients of the idea of one who smokes, smoking is harmful to health, age when first tried cigarettes and whether parents smoke or not, indicates that students with non-smoking parents, and those who tried smoking lately, those who know the harmful effect of smoking and those who are exposed more to cigarette smoking at home are more likely to be ex-smokers.

Discussion

The results of this study showed that smoking is prevalent among adolescents in Tabouk. This is a serious situation because studies estimated that 50% of adolescents, males and females who started smoking as adolescents, will continue to smoke for at least 16 – 20 years8. This has serious morbidity and mortality and socioeconomic implications. The economic costs in terms of medical expenses and in lost productivity is huge9, but the good news is that the majority of adolescent smokers in Tabouk wanted to quit and most of them tried seriously. This is in accordance with the findings of international studies among smoking adolescents10-12. Studies showed that quit rates are affected by peers, friends or family members13-17. In the Arab culture, the family is the most important social unit and the reason for cigarette smoking for adolescents is initiation of family members and friends. Parental smoking history plays an important role in the early adolescent smoking behavior. More than 30% of the students in our study have been confronted with at least one currently smoking parent in their home. Parental smoking cessation has differential effects on adolescent smoking, depending on the age the child was when the parent stopped. Bricker among others 17-20 found that an adolescent child to be an ever smoker was higher when the father had quit smoking between the years 11 -14 compared to quitting before the child reached the age of 7 years.

Our findings that family environment may have a significant effect on quitting smoking are in harmony with other studies14,16,19. Adolescents who lived in a household with a greater proportion of smokers were less likely to quit. Our study revealed that about 36% of those attempted to quit smoke at home. More than 40% of those who attempted to quit smoking, their source of cigarettes were home and more than 30% of all members living in the same household smoke. Smokers in the immediate environment of the ex-smoker place nicotine–laden smoke into the local air space, which is inhaled by the ex-smoker and may create a return of the physiological reinforcement of nicotine or may create a conditional physiological desire to smoke. This suggests support from other members of the household may play a crucial role in quitting smoking; this together with availability of cigarettes during the quitting attempt. About 36% of adolescents in our study reported they received advice from family members to stop smoking. Similar percentage of male (80%) and female (78.6%) smokers have attempted to quit. This is surprising, as Muslim Arab males might perceive that smoking helps increase their masculine image among their peers and makes them appear more mature. On the other hand, Muslim Arab females might perceive that smoking affects their feminine Islamic images and reputation, thus affecting their prospect of a good marriage and therefore have a higher tendency to quit smoking. Other studies found little gender differences in overall quit rates20,21,22. This appears to indicate that cessation is not influenced by socio-demographic variables, suggesting that quitting may be motivated by reaction to the consequences of smoking itself. The age at which adolescents had first become regular smokers did not prove to be a strong predictor of smoking cessation. About 11% of ex-smokers tried cigarettes before the age of 10 and more than 70% tried between the age of 10 and 15. Percentages were comparable for ex-smokers and current smokers. International studies reported conflicting associations. The majority of studies found that smokers who initiated smoking at an earlier age were less likely to attempt quitting or be successful in their attempts, while others reported no significant association of age with quitting23,24. The influence of friends who smoke is significant for both the initiation and the maintenance of smoking. As an adolescent grows up, the peer influences become more important than family influence. Our results showed more than 80% of ex-smokers have none or only a few friends who smoke. Adolescents who had few friends who smoke, had fewer cigarettes offered to them and would be able to resist pro-smoking pressure. Our results showed that about 70% had more than three attempts. This contradicts the findings from other studies14,15,17 and indicates that peer pressure from smokers may deter quit attempts and that more time spent with smokers infers less time in non-smoking environments, resulting in fewer quit attempts. Other studies12,14,15,21 found that a friend's smoking, cigarettes offering and perceived pressure to smoke, correlates with increased smoking. On the other hand, individual factors such as self-efficacy to resist peer pressure and anti-smoking beliefs were important to prevent and stop adolescents smoking. Our results showed that cessation programs were contacted by only 17% of adolescent smokers. This needs to be further explored to try to make these programs known to all adolescent smokers and to them more attractive to young smokers. Some smoking cessation activities are conducted in Primary Health Care clinics by physicians and dentists. Those activities have been inconsistent in providing advice and counseling against smoking and are characterized by the use of different and sometimes ineffective methods for smoking cessation, such as the use of acupuncture. Studies in other countries have shown the key role that physicians can play in smoking cessation and strategies have been devised to encourage anti-smoking counseling by physicians. Research

evidence supports that medical visits can provide an opportunity for tobacco intervention and should be used as an intervention method25. Physicians need to be non-smokers themselves and be trained to deliver effective cessation services. Studies conducted Riyadh showed that the majority (69.3%) of dentists were not confident in their skills in cessation activities for their youth patients. Some physicians question the effectiveness of their role in smoking cessation26 and some may lack the necessary skills and knowledge27. National guidelines for smoking cessation activities are needed. The majority of quitting attempts in other countries were self initiated, unprepared and unplanned28. The reasons for attempting quitting in Tabouk were mostly related to health considerations and family pressure in accordance with findings of previous studies in the country, which in addition to health concerns, religious considerations were remarkable29. Religious factors were not investigated in the current study in Tabuk. In studies outside Saudi Arabia religiosity was not a predictor of smoking30. In other countries in addition to health, price of cigarettes was also an important motive to quit31,32. It seems that smoking by youth is particularly sensitive to price and increased prices would be expected to deter young people from smoking. Price in the Kingdom was a motive for quitting in less than 5% of smokers. Price of cigarettes in the Kingdom is very cheap compared to income and is not expected to be a major anti-smoking motive. Increasing prices on cigarettes may be an important pathway to quit smoking. Body image and weight considerations were also important reasons for relapse in international studies particularly among females33,34. In Tabouk body image and weight were not significant predictors of quitting attempts and their outcome. School performance was not associated with quitting attempts and their outcome in Tabouk. Less than half of smokers in Tabouk who attempted to quit were successful quitters at the time of the study with quitting period of at least 30 days (range one month to three years). Studies showed that about one third of adolescent smokers were successful quitters at the time of the study 35,36,37. It is not known how many of them will become permanent quitters. Several studies reported approximately 3 out of 4 of every adolescent smokers have tried to quit smoking and have failed and that only 4 percent of young people at best are successful in their quit attempts each year38,39,40,41.

The findings from this study show that Saudi Arabia appears to face an enormous challenge in persuading smokers to stop smoking. Of the ever-adolescent smokers in Tabouk area the number who failed to quit and relapsed, exceeds the number of former smokers who have successfully quit. These findings should figure centrally in formulating smoking cessation programs. The high relapse rate indicates a need for effective methods for smokers for maintaining cessation. Nicotine replacement therapy and other pharmacologic approaches have not yet been widely used and these methods need specific evaluation in the Kingdom of Saudi Arabia.

The potential limitations of this survey are its use of self-reporting of cigarette smoking without biochemical validation and possibility of under- or over- reporting smoking habits. Religious considerations and some sociodemographic and economic factors should have been addressed. The survey findings call for a national strategy to increase smoking cessation activities with clear guidelines within a framework of a comprehensive plan and programmatic actions. This should include media campaigns to increase knowledge, education of health care and educational professionals to strengthen their role in encouraging and sustaining cessation, enhancing support from family and friends, and developing and evaluating smoking cessation methods. Programs to be effective and appealing to adolescents should center on internet and mobile phone messages as these are widely used by adolescents.

Table1. *Characteristics of smokers who attempted to quit and those who did not attempt quitting*

	Attempted		
	Yes(n=523)	No(n=134)	P- value
Gender			
Male	384 (80.0)	96 (20.0)	
female	155 (78.7)	22 (21.3)	0.142
# of cigarettes smoked			
≤ 5	461 (88.2)	107 (79.6)	
> 5	62 (11.8)	27 (20.4)	0.01
Source of cigarettes			
Buy	124 (23.8)	59 (43.8)	
Home	226 (43.1)	36 (27.1)	
Other source	173 (33.1)	39 (29.1)	0.001
Smoking help people feel comfortable			
More comfortable	100 (19.1)	43 (32.1)	
Less comfortable	423 (80.9)	91 (67.9)	0.001
Smoking harmful to health			
No	45 (8.5)	20 (14.6)	
Yes	478(91.5)	114 (85.4)	0.030
Idea of a person smoke			
Successful	105 (20.0)	53 (39.4)	
Not successful	418 (80.0)	81 (60.6)	0.001
Smoking from others harmful			
No	56 (10.8)	28 (21.2)	
Yes	467 (89.2)	106 (78.8)	.002
Exposed from others at home			
Less exposed	305 (58.3)	62 (46.0)	
More exposed	218 (41.7)	72 (54.0)	.008
Exposed at public places			
Less exposed	283 (54.1)	57 (42.3)	
More exposed	240 (45.9)	77 (57.7)	0.011
Proportion of smokers in the household			
£30	343 (65.6)	59 (44.2)	
> 30	180 (34.4)	75 (55.8)	0.021
Place used to smoke			
at home	291 (55.7)	27 (20.5)	
at school	39 (7.3)	23 (17.2)	
friends' and relatives house	118 (22.6)	64 (47.6)	
public places and social events	77 (14.8)	20 (4.7)	0.007

Table2. *Characteristics of ex-smokers (current non-smokers) and continuing smokers (current smokers)*

	Ex-smoker (n= 321)	Current smokers (n = 336)	Odd ratio	p- value
Gender Male Female	 229 (71.3) 92 (28.7)	 251 (74.7) 85 (25.3)	 1 0.84	0.335
Age when first tried smoking < 10 10 – less than 15 > 15	 34 (10.6) 248 (77.3) 39 (12.1)	 43 (12.8) 219 (65.2) 74 (22.0)	 1 0.75 1.54	0.073
Pocket money ≤ 10 > 10 and < 20 > 20	 280 (87.2) 40 (12.5) 1 (0.3)	 255 (75.9) 68 (20.2) 13 (3.9)	 1 1.73 14.27	0.003
Parents smoke None Both Father only Mother only	 204 (63.6) 6 (1.9) 109 (34.0) 2 (0.6)	 183 (54.5) 10 (3.0) 136 (40.5) 3 (0.8)	 1 1.86 1.39 1.67	0.014
Student performance poor good excellent	 36 (11.2) 201 (62.6) 84 (26.2)	 46 (13.7) 197 (58.6) 93 (27.7)	 1 0.78 0.87	0.502

Table 3. *Attitudes of ex-smokers and continuing smokers*

	Ex-smoker (n=321)	Current smokers (n= 336)	Odd ratio	p- value
Discuss harmful effects of cigarettes at home Yes No	 222 (69.2) 99 (30.8)	 230 (68.5) 106 (31.5)	 1 1.03	0.866
Think one who smoke have more or less friends Less more	 234 (72.9) 87 (27.1)	 249 (74.1) 87 (25.9)	 1 0.94	0.791
smoking help one to be more or less comfortable at celebration or social gatherings More less	 45 (14) 276 (86)	 95 (28.3) 241 (71.7)	 1 0.41	0.041
Smoking helps one to look more or less attractive More less	 67 (20.9) 254 (79.1)	 86(25.6) 250 (74.4)	 1 0.77	0.166
Smoking makes gain or lose weight Gain Lose No difference	 18 (5.6) 208 (64.8) 95 (29.6)	 15 (4.5) 204 (60.9) 116 (34.6)	 1 1.18 1.47+	0.349
Smoking harmful to health Yes No	 299 (93.1) 22 (6.9)	 295 (87.8) 41 (12.2)	 1 1.89	0.024
Number of friends smoke None Some or most All	 147 (45.8) 141 (43.9) 33 (10.3)	 72 (21.4) 160 (47.6) 104 (31)	 1 2.32 6.43	0.002
Idea of one who smokes Positive negative	 38 (11.8) 283 (88.2)	 108 (32.1) 228 (67.9)	 1 0.28	0.001
Exposed to smoking from others at home Less more	 208 (64.8) 113 (35.2)	 170 (50.7) 165 (49.3)	 1 1.79	0.001
Exposed to smoking from others in public places Less more	 207 (64.5) 114 (35.5)	 145 (43.2) 191 (56.8)	 1 2.39	0.002

Table 4. *Results for stepwise discriminant analysis*

	Wilks' lambda	F - value	Standardized coefficients
Number of friends smoke	0.903	70.02	0.806
Smoking parents	0.867	49.87	0.618
Smoking from others at home	0.852	37.12	0.552
Idea of one who smokes	0.845	29.70	-0.431
Smoking harmful to health	0.841	24.59	-0.341
Age when first tried cigarettes	0.837	21.07	-0.311
Number of cigarettes smoked	0.744	18.24	-0.215
Source of cigarettes	0.732	12.14	-0.204

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MONTHLY SURGERY TIPS

WARNING: This article contains graphic images below of the human body during surgery.

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We would appreciate suggestions regarding further topics. Next monthssuggested topic is malignant melanoma.

Introduction

This is the first in a series of surgical tips provided by General Surgeon Mr Maurice Brygel of Melbourne Australia. He has extensive experience in education using multimedia and information and communications technology. He has designed two websites which are widely used by both patients and doctors as a global medical education resource. He founded the video-book of surgery.

His areas of surgical interest include hernia repair under local anaesthetic with experience of over 9,000 cases. His other areas of interest include all aspects of office skin surgery and anorectal conditions. Future tips will cover all these different areas as well any interesting cases that arise in the course of his or his colleagues' practise. They will not necerssarily be limited to those areas.

All tips will be published in an annual volume.

He would still like to emphasise and will be concetrating on, the history and examination of any lump or bump or surgical problem. This will usually lead to the correct diagnosis and approporiate management.

Herniae

This series of photos is interesting in that the patient presented six years following a right inguinal hernia repair with a painful swelling and felt that his hernia had come back. However an ultrasound was carried out which suggested that he had a femoral hernia and not a recurrence. Clinical examination verified the femoral hernia.

Hernias can be difficult to diagnose clinically because they are often present in overweight patients and can be difficult to find. In this case the lump was readily palpable.

The next question is usually, is it an inguinal or femoral hernia? In this case it was felt to be a femoral hernia because these present usually below and lateral to the pubic tubercle. However confusion can arise because femoral hernias ride up over the abdominal wall as they expand due to the covering of the deep fascia (scarpas) and thus can appear to be higher. Thus during the examination one should attempt to move it down as well.

The femoral hernia can be reducible or irreducible.

In this case it was an irreducible painful femoral hernia.

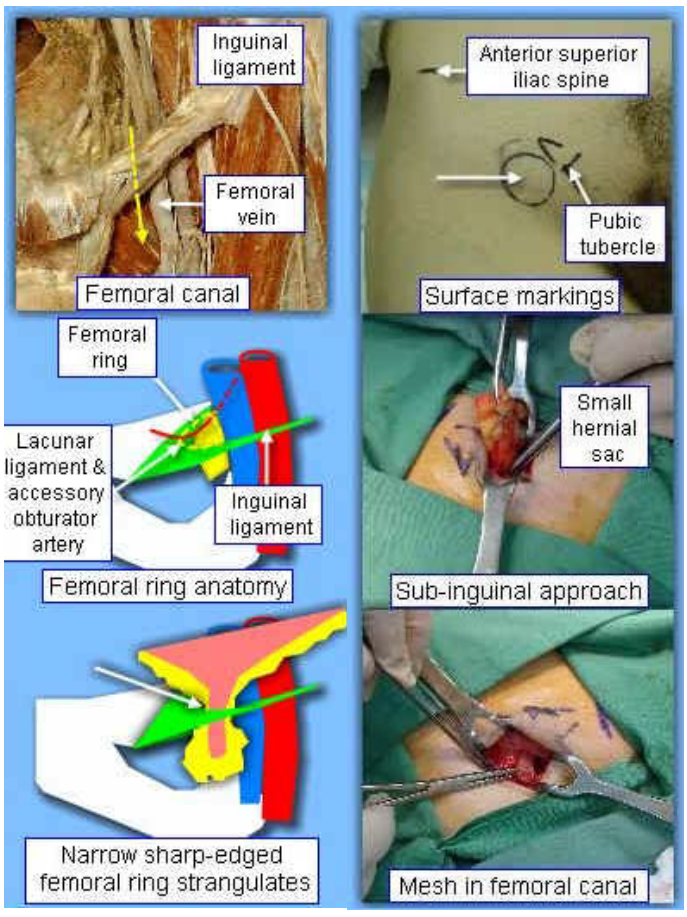
It is important in considering the diagnosis and operation to consider the anatomical landmarks.

In this case the femoral hernia presents through the femoral ring, which is medially bounded by the lacuna ligament and laterally by the femoral vein. Anteriorly is the inguinal ligament and posteriorly the pubic bone.

In all cases of abdominal pain the groin should be examined to exclude inguinale and femoral hernias. The femoral canal should be examined to ensure there is no femoral hernia because of the higher risk of strangulation.

Surgery can be performed with a variety of approaches. In this series one sees the low approach directly over the femoral canal. For further information find attached link to Melbourne Hernia Clinic http://www.hernia.net.au.

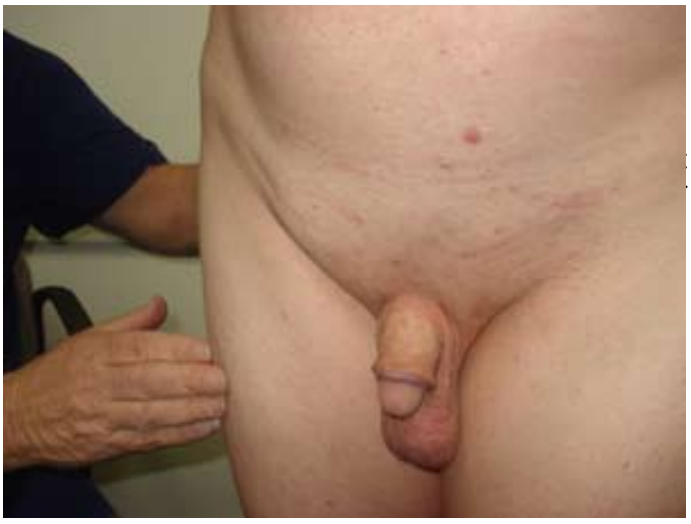
LEFT FEMORAL HERNIA ***RIGHT FEMORAL HERNIA***



Courtesy of Dr Gerry Ahern, Monash Univeristy

Procedure

This is the clinical examination - demonstrates a right femoral hernia, following a right inguinal hernia operation previously.



The patient is examined standing. A bulge in the right groin can be seen and the scar of the inguinal hernia repair is seen.

CLINICAL TIPS:

All patients with a hernia should be examined standing up then lying down.

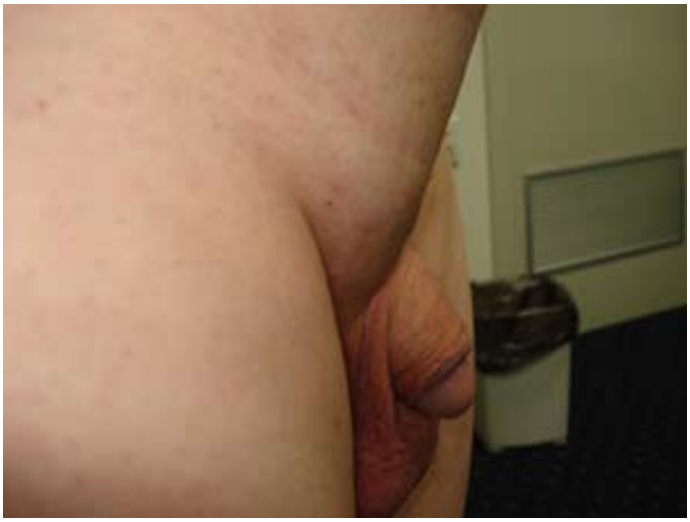
Both sides must be examined.

All possible hernia sites should be examined

The patient is asked to cough with their head turned away from the examiner and any cough impulse is noted.

Then the hernia or swelling is palpated to confirm whether it is a hernia. Reduction is attempted by gentle pressure.

In overweight patients the hernia may be difficult to see or even palpate. Both the external ring and the femoral canal can be examined withg the tip of the fingers and the patient coughing. Sometimes an squelch can be felt.



Lateral view.

CLINICAL TIPS:

A differential diagnosis should be considered.

FEMORAL HERNIAS

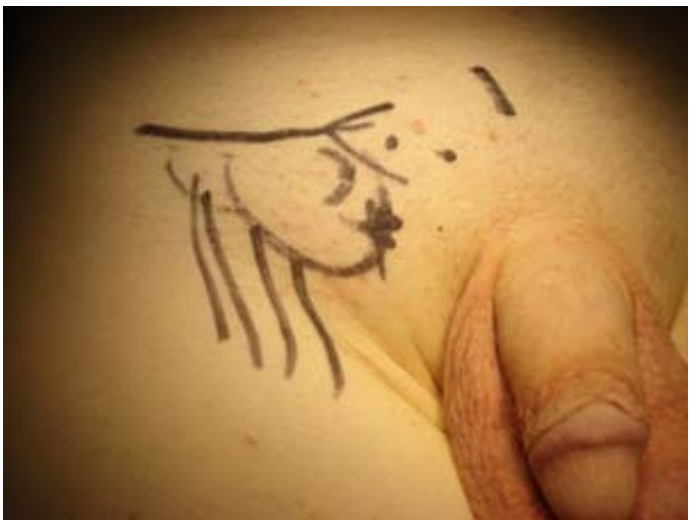
Inguinal hernia

Lymph nodes
Lipomata
Abscess

Close-up of the scar.

CLINICAL TIPS:

Femoral and inguinal hernias can occasionally occur together therefore must examine both sites, the inguinal canal and the femoral canal.

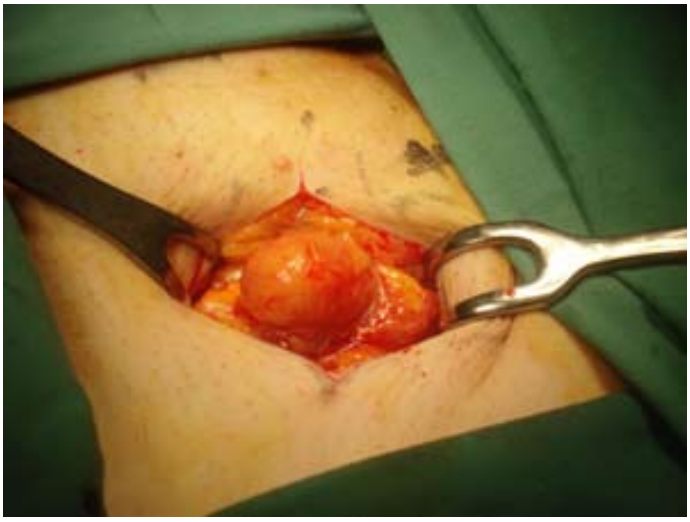


Patient in theatre recumbent and the surface markings shown. Transverse upper line is the previous incision. Triangle is the external ring. The swelling is outlined and the vertical lines are the femoral nerve, artery and vein. Note that the swelling overlies the vein.

CLINICAL TIPS:

Note: The large femoral hernia expands and actually appears to be anterior to the femoral vein as well. This is important when making a surgical incision.

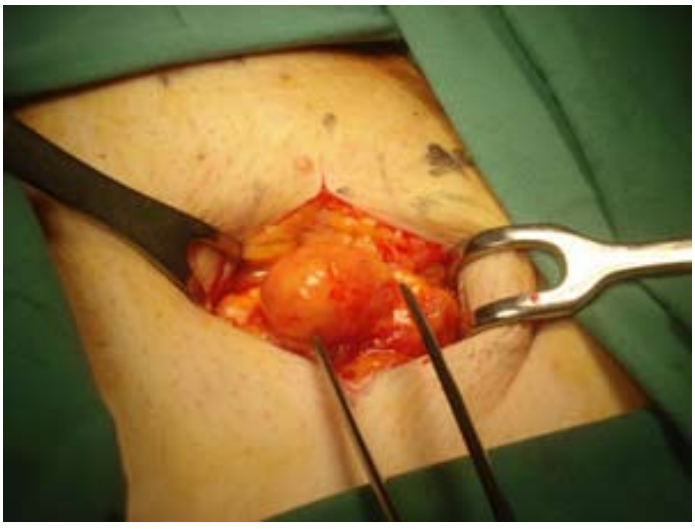
Differential diagnosis of a strangulated femeral hernia is an abscess in the groin.



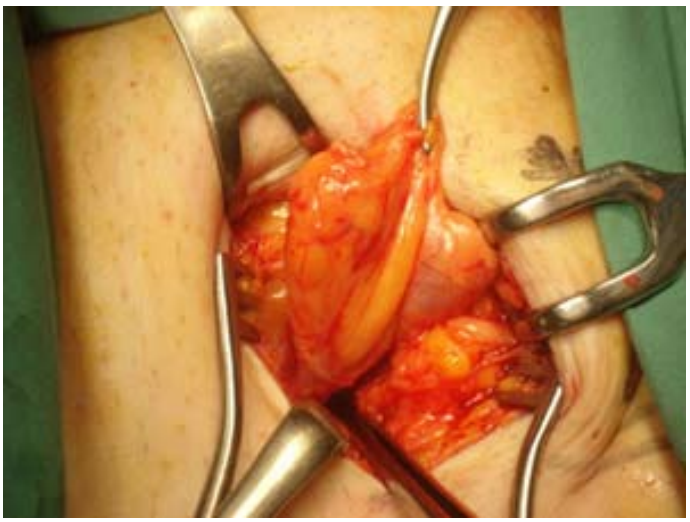
The hernia is exposed.

SURGICAL TIPS:

The femoral hernia looks just like a lump of fat. To expose the hernia the deep fascia of the thigh is divided. There may be venous tributaries of the long sapnenous vein or branches of the femoral artery such as the superficial epigastric. Lymph nodes may also be encountered.



Exposed.

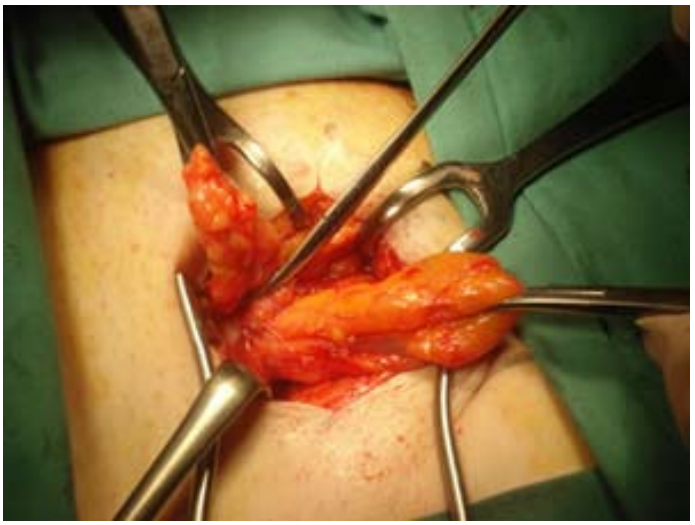


Narrow neck demonstrated. Sac has been dissected free.

SURGICAL TIPS:

Femoral hernias are very commonly irreducable and may easily strangulate.

To reduce the hernia the surrounding fat is excised so that the sac can be gently manipulated back in.



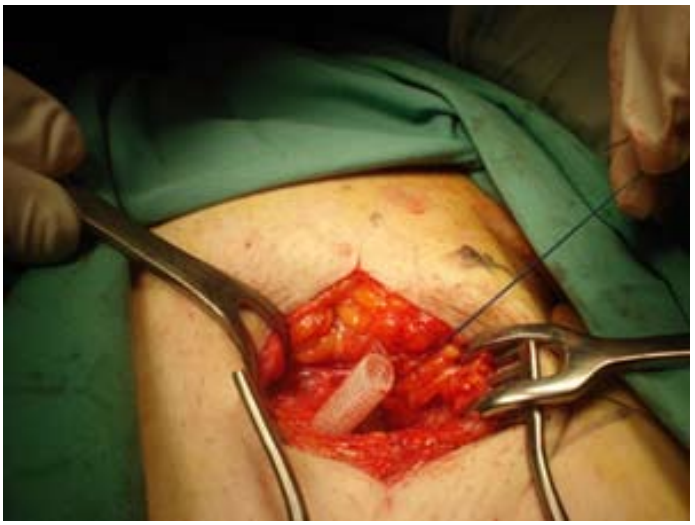
Sac being demonstrated. Fat being dissected free. Sac is transfixed and excised or even maybe just reduced. Fat is excised.

SURGICAL TIPS:

Femoral hernias are very commonly irreducable and may easily strangulate.

To reduce the hernia the fat is removed and the sac is narrowed down.

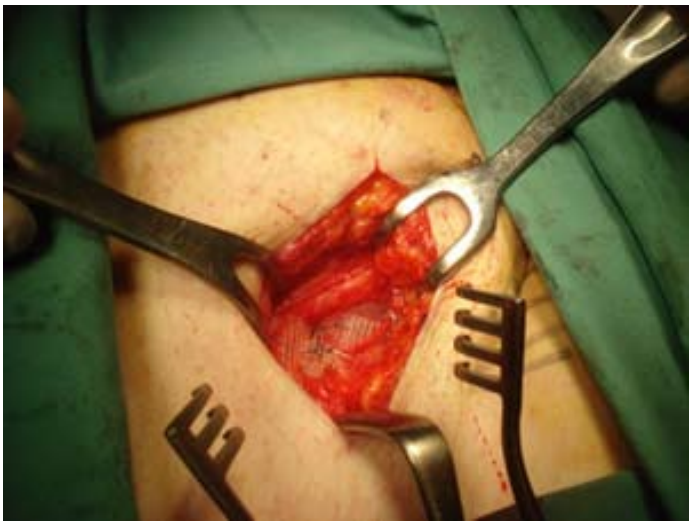
The contents must be reduced. The sac is then opened and by this stage the henria can be readily reduced. The sac is then transfixed and excised.



Mesh plug placed into femoral canal.

SURGICAL TIPS:

Previously, femoral hernias were repaired by suturing. However, this causes tension with a higher rate of reccurence. There was also the risk of narrowing or injuring the femoral vein. Now a popular technique described by Lichtenstein is to insert a rolled up mesh like a cigarette. Commonly polypropylene. This avoids tension and is readily fixed into position with a low recurrence rate.



Mesh plug fixed into position.

Conclusion

Thus, femoral hernias are not common compared to inguinal hernias. They occur relatively more frequently in females. Because of the narrow rigid walls of the femoral ring they are commonly irreducable and may readily strangulate. Thus, they should be repaired in most cases to avoid the risk of strnagulation and emergency surgery. They are sometimes confused with inguinal hernias and other lumps which may occur in the femoral triangle.