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A. Abyad, MD, MPH, MBA, AGSF, AFCHSE
Chief Editor

This is the second issue this year and with it we announce the winner of the Second Annual MEJFM Middle East Doctor of the Year Award

The winner of our 2006 award is Dr. Thamer Kadum Yousif Al Hilfy, MBChB, DCM, FICMS, JMHPE MsC Member, Medical education, Director Health For All Centers (NGO), Iraq, Baghdad; Assistant Professor, Alkindy College Of Medicine, Baghdad.

Doctor Al Hilfy is a tireless supporter of the advancement of Medicine in Iraq and holds many postgraduate qualifications and is a member of a range of Iraqi, and International Medical Societies, that focus on various health needs of the community. These include Member of Iraqi National Medical Association; Member of Iraqi Higher Education Society; Director of health for all center (NGO), Member of the examining committee, 6th year students/Tikrit College of medicine, Supervisor on master degree students' community medicine since 2003-2006, Member of the examining committee of researches of higher degree doctors (for different medical branches/ college of medicine), Member of Arab neonatology forum, Member of Arab American medical society, Tuberculosis and Chest disease society, Iraqi society of children, Iraqi medical society, Iraqi society of family planning, and the Iraqi society of chest and heart.

Dr Al Hilfy is also a prolific researcher and writer, and supports and nurtures his students. He has made these achievements within the constraints of the ongoing nightmarish situation in Iraq. We congratulate Dr Al Hilfy and indeed all Iraqi doctors doing their absolute best under such trying conditions.

Obesity is quite prevalent in the region and there are two papers in this issue reporting on obesity. A paper from Saudia Arabi and a second paper from Turkey. The paper from Saudi Arabia was a cross sectional survey aiming at estimating the prevalence of overweight and obesity among King Saud university students, Riyadh, Saudi Arabia. The present study showed that 31% of the study sample were overweight. Improving University student's awareness about overweight and obesity health problems is an essential step towards decreasing the prevalence of overweight and obesity among university students and in the community. The paper from Turkey studied through a random sample the prevalence and ethnic differences of obesity in the Southern Province of Turkey. A total of 900 individuals were enrolled in the study. The authors stressed that the prevalence of obesity in Adana is higher than expected in both urban and rural areas. There was significant relationship between obesity and age groups, lower educational status, female gender, number of pregnancies, marital status. There was no significant relationship between ethnicity and obesity. There is need for a national strategy to tackle contributors to the excess weight gain of the Turkish population.

A Retrospective analysis of Pediatric ocular trauma is presented from Jordan. The authors aims to analyze the causes and the outcome of pediatric ocular trauma at Prince Ali Hospital. They reviewed the medical files of one hundred and twelve children below the age of 14 years, who were presented to the eye clinic or referred from pediatric emergency clinic with ocular injuries. Ninety-eight (87.5%) of the patients were having normal or near normal visual acuity at time of discharge from the clinic, thirteen (11.6%) suffered moderate to severe decrease in there visual acuity, one case only (0.9%), lost his vision in the affected eye.

Dr Thamer reviewed the use of evidence based medicine in the Iraq primary care setting through the use of Anti-Tuberculosis Primary Health Care. In his study he produced three types of surveys. The first survey investigated PHCPs' attitudes towards the concept of EBM. The second type was designed to build up scientific evidence from primary research findings (randomized controlled trials) based on the systematic reviewing methodology to identify the strategies that promoted adherence to Tuberculosis (TB) treatment. The third type was designed to explore the opinions of experts in National TB Control Programmes about the ability of applying achieved strategies in general practice.

Dr. Abu Salem O & Dr Khasawneh M studied the diagnostic accuracy of CT protocol in patients with suspected acute appendicitis. Of 124 patients referred for CT, 96 patients subsequently underwent surgery. Appendicitis had been correctly predicted in 88 of 96 patients surgically proven to have appendicitis. CT in the diagnosis of acute appendicitis had a sensitivity of 95%, and a specificity of 93%.

Beyaztas F.Y, Dokgöz H , Saka E et al evaluated Childhood Deaths in Istanbul, Turkey. The aim of the authors is to determine the features of and changes in the medico-legal childhood deaths that occurred in Istanbul, Turkey; and to contribute to the establishment of a database on childhood deaths. The authors stressed that in order to prevent childhood deaths, preventive and curative health services should be strengthened, providing training programs for parents and should be a concern of the government bodies and civil society.

A case study from Saudi Aramco Primary Care Division reports a case of adult gynecomastia. The author stressed that Gynecomastia is a strictly male condition and is the most common cause of male breast enlargement. Gynecomastia is predominantly benign; however, remote possibilities of underlying malignancy warrants further investigation, especially in the middle aged and elderly population.

Prevalence and Ethnic Differences of Obesity at Southern Province of Turkey

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Keywords: obesity, prevalence, body mass index, ethnicity, Turkey

INTRODUCTION

Obesity is a health problem that contributes significantly to morbidity as well as overall mortality. The prevalence of obesity in some low income and transitional countries is as high as, or even higher than, the prevalence reported in developed countries, and it seems to be rapidly increasing. In most countries, the prevalence of obesity is higher in women than in men, and in urban than in rural areas.[1]

There is considerable evidence that overweightness and obesity have emerged as epidemics in developed countries since 1980s.[2] This is a matter of concern because overweightness and obesity are major risk factors for several chronic conditions, including coronary heart disease, type 2 diabetes mellitus, hypertension and selected cancers which all cause mortality.[3-7] Mortality due to cardiovascular disease is increased in obese individuals, and the death rate from complications of type 2 diabetes mellitus is extremely high. The strongest evidence that obesity has an adverse effect on health comes from population-based prevalence (cross-sectional) and incidence (longitudinal) studies.[8]

Our study is a cross-sectional study designed to estimate the prevalence of obesity and its determinants in an adult population in Adana, southern province of Turkey in 2003.

METHODS

Sample

Our population was Adana City population, Turkey. The sample size was calculated from the total population of Adana (n=1.849.478). With the maximum acceptable difference set at 5%, design effect at 2, 3 clusters, estimated true rate of 30 %, and a 95% confidence interval, the required sample size was 648.9

Method

This study is a cross-sectional home based survey. Selection of subjects was performed by random sampling design. Sampling procedure was as follows: Selection performed by random sampling design with the first stage being selection from areas of enumeration districts of the population census and the second stage being identification of dwellings and third stage being selection from three different (low, intermediate and high income) socioeconomic statuses. Each dwelling in the sampling universe had an equal probability of being selected for inclusion in the first stage.

Only 25-65 years old men and non-pregnant women were interviewed by health professionals at home using a questionnaire form. Sociodemographic details, personal and family medical histories were recorded. Anthropometric measurements were performed using the Monica Manual.[10] Nonresponse/refusal rates underwent statistical adjustment by using appropriate sampling weights.

Informed consent was obtained after the nature of the procedures had been fully explained to participants. Ethical approval was obtained from the Ethics Committee of Cukurova University Faculty of Medicine.

Height and Weight

Heights of the participants were measured to the nearest half centimeter. The subject was asked to remove shoes and stand with his/her back to the rule. The back of head, back, buttocks, calves and heels touched the upright. The head was positioned so that the top of the external auditory meatus was in the same level with the inferior margin of the bony orbit. Weight was measured to the nearest tenth of a kilogram. The subject was asked to remove shoes and was lightly dressed only. Obesity was calculated using body mass index (BMI) formula (BMI=weight/height2 [kg/m2]); underweight <18.5 kg/m2; normal=18.5-24.9 kg/m2; overweight=25.0-29.0 kg/m2; obese =30.0 kg/m2.

Waist and Hip Circumference
The subject was asked to stand with feet 12-15 cm apart, weight equally distributed on each leg and to breathe normally. The observer either sat or knelt in front of the subject to place the tape. The waist girth was measured at the mid point between the iliac crest and the lower margin of the ribs. The hip girth was recorded as the maximum circumference around the buttocks posteriorly and anteriorly by the symphysis pubis. Measurements were taken to the nearest 0.5 cm. Waist circumference (WC) ³ 94 cm in males was accepted as overweight, whereas WC ³ 102 cm as obese; (³80 cm and³ 88 cm in females, respectively). Waist/hip ratio (WHR) =1.0 in males was accepted as overweight, whereas WHR³ 0.95 as obese; (=0.85 and =0.80 in females, respectively).

Quality Control
All members of the survey team were trained in all measurements. Visual quality control was a continuous part of the field work. Retraining and examining of survey team members were performed on a weekly basis. Completed questionnaires were checked for illegible answers and unanswered questions, before leaving an area.

Data Analysis
Data were analyzed using a statistical package program and Pearson chi square, ANOVA, one-way analysis of variance analysis.

Results
Sociodemographic features of subjects are presented in Table 1. The majority of subjects were elementary school graduates (36.7%). As level of education increased percentage of females decreased (p=0.001). The majority of subjects were married (90.6%). There was no gender difference in marital status except divorced/widowed (92.5% were female). The majority were in low income level (77.3%).

The data reported here suggested that there is a progressive increase in weight, and therefore in BMI, in both men and women up to 50 years of age, with women attaining a higher mean of BMI. The increase is particularly in the 20-29 years of age, amounting to 5-6 kg in men and 6-7 kg in women. The prevalence of underweight, overweight and obesity is presented in Table 2. Of 900 subjects, 38.3% were overweight and 26.6% were obese. Our study showed that there may be no significant relationship between ethnicity and obesity (p>0.05) (Table2).

Prevalence of obesity
The majority of the subjects tend to be in the overweight group (38.3%). Obesity was more frequent in married subjects than not married ones (p=0.001), in subjects with low socioeconomic status than ones with higher socioeconomic status (p=0.002). Obesity was higher in subjects with older age till 55-65 years of age. In 55-65 years of age rate of obesity decreased. There was a significant relationship between obesity and age groups (p=0.001). Obesity was higher in subjects with lower educational status (p=0.001) (Table 2). According to waist circumference (WC), the majority was in the normal group (48.3%), obese people were in the second rank with 31.8% and overweight were 19.9%. The percentages according to WHR were 58.0% and 42.0% for the normal and obese people, respectively, (Table 3).

Obesity was more frequent in females than males according to BMI, waist circumference and WHR (p=0.001) (Table 3). The majority of women in our study group had 3-4 pregnancies on average. Obesity was more frequent in women with higher number of pregnancies than ones with lower number of pregnancies according to BMI (p=0.001) (Table 4).

Discussion
Obesity is a common chronic disease in Western societies. The prevalence of obesity and overweight is progressively increasing in the developed countries.[11,12] It is estimated that there are 250 million people with BMI =30 in the world which is 7% of the world population. [13]

Turkey has been experiencing a rapid phase of industrialization and urbanization in recent decades and has often been recognized as a role model for developing economies. The 'westernization' of global eating habits has also brought about an increase in the number of fast-food outlets in Turkey during the last decade.14 Obesity and overweight are increasing in Turkey (TEKHARF 1990 and 2000).[15] The overall prevalence of obesity in adults was 18.6% in year 1990. Ten years later in 2000, the prevalence was 21.9%, which shows a relative increase rate of 17.7%. As it is true for most of the countries, overweight is more common in men and obesity in women in Turkey.[15]

Obesity prevalence is 6-20% in males and 6-30% in females in Europe.16 The highest rates are in the East (Russia, former East Germany and Republic of Czech) and the lowest in Central Europe and Mediterranean countries. Rates of North America are similar to Europe, 20% of males and 25% of females in the United States of America (USA) are obese whereas 15% of adult population in Canada is obese. Prevalence of obesity is 15-18% in Australia and New Zealand. Japan as an industrialized country has a very low rate of obesity (less than 3%).[16]

In this study, it is possible that the same factors affect obesity, including older age, female gender, lower educational and socioeconomic status, and high number of pregnancies. Increasing age is widely accepted as

a predisposing factor for obesity. As the individual gets older, the metabolic rate slows down. Besides, the inclination for daily exercise decreases dramatically.

The results of this survey show a steady, but significant, decline in both BMI and WHR in people with higher educational status. Those people with higher socioeconomic status are able to afford fitness activities and are also able to appreciate and implement the health advertisements in media. Our data suggests that obesity is a serious problem in Adana. The obesity prevalence is higher in urban than in rural regions, and in females than males. The prevalence of overweight is higher in males than females and it is higher than the rate for overall Turkey. The prevalence of obesity is higher in urban males and females at every socioeconomic status, except for urban females with high socioeconomic status. Rural-to-urban migration and rapid urban growth are elements of epidemiological transition. Progressive urbanization and mass media may contribute to the shift in diet of rural migrants who abandon their typical rich-in-vegetables- and-cereal diets in favor of those high in processed and animal food. This change of diet is accompanied with reduced levels of physical activity resulting in overweightness and obesity.

In our study, obesity measured by WHR was found to be higher than obesity measured by BMI and WC. The reason may be due to comprehensiveness of WHR including android type of obesity. It is well known that cardiovascular diseases are more frequent in android type obesity. According to WHO MONICA data, the measurements only by WC, WHR or BMI show variations in different countries.[17] Prevalence of obesity measured by WC is higher than prevalence of obesity measured by BMI which may be due to including subjects with abdominal obesity. Our results are similar to those of 19 countries in WHO MONICA study phase 2 (1987-1992) (WC=102 cm in males, =88 cm in females).[17,18]

The ethnic profile of Adana population is as follows: The population of Adana is a mix of the Turks who arrived about 900 years ago, Eti Turks and Kurds, both groups migrated from Syria over 1200 years ago. The population shares a social and cultural identity together more than 1000 years old. Most marriages in Adana were consanguineous. This inbreeding has also limited the intermingling of cultures, and has contributed to the relatively well-preserved sociocultural and familial identity of each ethnic subgroup, despite residence in the same geographical location.[19,20] Although all ethnic groups in Adana represent relatively discrete populations with distinct historical and geographical backgrounds no significant relationship was detected between ethnicity and obesity of the groups. Perhaps this was the most interesting finding of our study.

Limitations

It should be noted that this study has primarily been concerned with the prevalence of Adana and suffers from a number of limitations. First, census data we used has little correlation with a true balance of society and there is a bias against lower socio-economic status or ethnicity from the fact that they may be homeless or fail to be recorded on the census. Secondly, as our aim in this study was to show only the prevalence of obesity in Adana City, we are planning to perform a future study about people with BMI <18.5 kg/m2 and between 25-29 kg/m2 and the contributing nutritional factors and third, we would like to point out that we have not explored a potential "gene dosage" influence versus environment.

CONCLUSIONS

The epidemiological and experimental data show that weight reduction is one of the most beneficial lifestyle changes that can be undertaken by obese patients. Few obese patients will ever achieve their cosmetic 'ideal'; however hard they work to lose weight. However, they can truthfully be told that a modest reduction in body weight is likely to help them live longer and remain in better health. Many physicians regard the management of obesity as an uphill and unrewarding struggle. Obese patients attending chronic disease clinics are routinely advised to lose weight, but there is often little expectation that the advice given will be accepted or acted upon.

Pharmacological treatment of obesity is still regarded with skepticism, here in Adana. Medical practitioners are very concerned about the deleterious side effects (real or imagined). Anti-obesity drug use is restricted to patients with BMI=30 kg/m2. The consideration is given for patients with BMI<30 kg/m2 having significant comorbidities. However, the first-line strategy for weight reduction and weight maintenance is a combination of diet, exercise and behavior modification. This pattern of treatment seems to be keeping with what is practiced in the United Kingdom.[21] There is therefore much educational work to be performed. The energy-deficient diet, combined with appropriate exercise, will remain the cornerstone of most weight reduction programs, here in Adana. However, we may not neglect other possibilities.

The recent WHO report noted that the optimum fat intake for preventing weight gain was probably only 20-25%.[13] This contrasts with the usual advice for the prevention of cardiovascular disease where the emphasis is on the fatty acid content of the diet, with a 30% total fat value being a pragmatically derived goal as part of the need to limit saturated fatty acid intakes. Clearly there is a need for a national strategy to tackle contributors of excess weight gain of Turkish population and we would like to suggest the need for a larger scale study of obesity prevalence.

Table 1. Sociodemographic Features of Subjects (n=900)

Sociodemographic features		Gender					
		Female		Male		Total	
		n	%*	n	%*	n	%**
Age	25-29	97	54.8	80	45.2	177	19.7
	30-34	72	48.0	78	52.0	150	16.7
	35-39	84	59.6	57	40.4	141	15.7
	40-44	67	47.2	75	52.8	142	15.8
	45-49	69	54.3	58	45.7	127	14.1
	50-54	45	42.5	61	57.5	106	11.8
	55-59	12	38.7	19	61.3	31	3.4
	60-65	12	46.2	14	53.8	26	2.9
Residential area according to socioeconomic status	Low	149	49.3	153	50.7	302	33.6
	Intermediate	154	51.2	147	48.8	301	33.4
	High	155	52.2	142	47.8	297	33.0
Educational status	Illiterate	137	83.5	27	16.5	164	18.2
	Can read and write	26	52.0	24	48.0	50	5.6
	Elementary school	146	44.2	184	55.8	330	36.7
	Secondary school	28	35.9	50	64.1	78	8.7
	High school	78	47.6	86	52.4	164	18.2
	Academy	16	48.5	17	51.5	33	3.7
	University	27	33.3	54	66.7	81	9.0
Marital status	Married	398	48.8	417	51.2	815	90.6
	Single	23	51.1	22	48.9	45	5.0
	Divorced or widowed	37	92.5	3	7.5	40	4.4
Ethnicity	Turkish	294	50.9	284	49.1	578	64.2
	Kurdish	123	49.2	127	50.8	250	27.8
	Eti Turks1	41	56.9	31	43.1	72	8.0
Income level	Low	356	51.1	340	48.9	696	77.3
	Intermediate	75	49.7	76	50.3	151	16.8
	High	27	50.9	26	49.1	53	5.9

* = row percentage ** = column percentage

Table 2. Body Mass Index and Sociodemographic Variables

		Body mass index						
		<30		30		Total		
		N	%*	N	%*	N	%**	p
Gender	Female	286	62.4	172	37.6	458	50.9	
	Male	358	81.0	84	19.0	442	49.1	0.001
Age	25-29	151	85.3	26	14.7	177	19.7	
	30-34	120	80.0	30	20.0	150	16.7	
	35-39	111	78.7	30	21.3	141	15.7	
	40-44	102	71.8	40	28.2	142	15.8	
	45-49	69	54.3	58	45.7	127	14.1	
	50-54	55	51.9	51	48.1	106	11.8	
	55-59	20	64.5	11	35.5	31	3.4	
	60-65	16	61.5	10	38.5	26	2.9	0.001
Residential area according to socioeconomic status	Low	483	69.4	213	30.6	696	77.3	
	Intermediate	119	78.8	32	21.2	151	16.8	
	High	42	79.2	11	20.8	53	5.9	< 0.05
Educational status	Illiterate	90	54.9	74	45.1	164	18.2	
	Can read and write	31	62	19	38	50	5.6	
	Elementary school	234	70.9	96	29.1	330	36.7	
	Secondary school	60	76.6	18	23.1	78	8.7	
	High school	127	77.4	37	22.6	164	18.2	
	Academy	28	84.8	5	15.2	33	3.7	0.001
	University	74	91.4	7	8.6	81	9.0	
Ethnicity	Turkish	409	70.7	169	29.3	578	64.2	
	Kurdish	186	74.4	64	25.6	250	27.8	
	Eti Turks [1]	49	68.1	23	31.9	72	8.0	0.447
Marital status	Married	583	71.5	232	28.5	815	90.6	
	Single	38	84.4	7	15.6	45	5.0	< 0.023
	Divorced or widowed	23	37.5	17	42.5	40	4.4	
Income level	Low	483	69.4	213	30.6	696	77.3	
	Intermediate	119	78.8	32	21.2	151	16.8	
	High	42	79.2	11	20.8	53	5.9	< 0.05

1. After the establishment of Turkish Republic (1923), the term "Eti Turks" is mistakenly attributed to the (Arab) Allawites living in the Southern part of Turkey around Cukurova and Antioch.[19,20]

* = row percentage ** = column percentage

Table 3. Obesity with Respect to Body Mass Index, Waist Circumference and Waist-Hip Ratio

Obesity category	Body mass index						Waist circumference						Waist-hip ratio					
	Male		Female		Total		Male		Female		Total		Male		Female		Total	
	n	%*	n	%*	n	%**	n	%*	n	%*	n	%**	n	%*	n	%*	n	%**
Non-obese	358	81.0	286	62.4	644	71.6	393	88.9	221	48.3	614	68.2	364	82.4	158	34.5	522	58.0
Obese	84	19.0	172	37.6	256	28.4	49	11.1	237	51.7	286	31.8	78	17.6	300	65.5	378	42.0
Total	442	49.1	458	50.9	900	100	442	49.1	458	50.9	900	100	442	49.1	458	50.9	900	100

* = row percentage ** = column percentage

Table 4. Obesity Status and Number of Pregnancies (measured by BMI)

	Obesity status measured by BMI					
		Non obese		Obese		Total	
		N	%*	N	%*	n	%**
Number of pregnancies	0	39	81.3	9	18.8	48	10.5
	1-2	74	73.3	27	26.7	101	22.1
	3-4	89	67.9	42	32.1	131	28.6
	5-6	44	51.2	42	48.8	86	18.8
	7+	40	43.5	52	56.5	92	20.1
	Total	286	62.4	172	37.6	458	100.0

2 = 32.7 df = 4 P = 0.001 * = row percentage ** = column percentage

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Overweight and Obesity among university students, Riyadh, Saudi Arabia

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Key words: overweight, obesity, university student, Saudi Arabia.

ABSTRACT

Objectives: The aim of the study was to estimate the prevalence of overweight and obesity among King Saud university students, Riyadh, Saudi Arabia.

Methods:
Design: Cross sectional survey.
Setting: The study was conducted in a male university primary health care clinic, at King Saud University, Riyadh, Saudi Arabia, during the period from 23 April to 7 June 2006.
Subjects: Male University students from different colleges who attend the university primary care clinic were included in the study. Weight and Height were recorded, and body mass index (BMI) was calculated for each student, using the equation (weight in kg/ height in meter2). WHO classification was used for defining overweight (BMI 25-29.9 kg/m2) and obesity (BMI = 30 kg/m2) categories. The statistical analysis was carried out using the statistical software for social science version 11.5.

Results: There were 701 university students in the study, with mean age = 21.7 years. The present study showed that 31% of the study sample from King Saud university students in Riyadh, Saudi Arabia were overweight i.e. their body mass index (BMI) was 25- < 30 kg/m2, and 23.3% of the university students were obese i.e. their body mass index (BMI) was more than or equal to 30 kg/m2, while only 45.8% of the university students had normal body weight i.e. their body mass index

Conclusion: Improving University student's awareness about overweight and obesity health problems is an essential step towards decreasing the prevalence of overweight and obesity among university students and in the community.

INTRODUCTION

Although interest in, and funding to treat, obesity have increased, its prevalence has not yet decreased.(1) Overweight and obesity are global health problems. In Canada, recent reports have indicated that 57% of adult men and 35% of adult women are overweight or obese.(2,3) The prevalence of overweight in children and adolescents and obesity in adults in the United States has increased over several decades.(4-6) Obesity and overweight are well known risk factors for coronary artery disease, and are expected to be increasing in the Kingdom of Saudi Arabia. A community based national epidemiological health survey conducted by examining 17,232 Saudi subjects in the age group of 30-70 years of selected households over a 5 year period between 1995 and 2000, showed that obesity and overweight are increasing in the kingdom of Saudi Arabia with an overall obesity prevalence of 35.5%.(7) A cross sectional national epidemiological household survey was conducted in different areas of Saudi Arabia from 1994 to 1998, and the study group included 12,701 children (boys 6281; girls 6420), with ages ranging from 1-18 years. This study showed that the overall prevalence of overweight was 10.7% and 12.7% in the boys and girls, respectively, and obesity was 6% and 6.74% in the two groups, respectively.(8)

Obesity represents a major threat to health and quality of life in Arabian populations.(9-12) Several reasons have been suggested to explain the rising prevalence of obesity in the kingdom of Saudi Arabia. These include the major economical development during the past 30 years, which

had resulted in profound changes in eating and physical activity. The combination of westernized and high fat diets and reduced physical activity suggests that sedentary lifestyles are the most important factor.(13) The aim of the study was to estimate the prevalence of overweight and obesity among King Saud university students, Riyadh, Saudi Arabia.

MATERIALS AND METHODS

Design: Cross sectional survey

Setting: The study was conducted in a male university primary health care clinic, at King Saud University, Riyadh, Saudi Arabia, during the period from 23 April to 7 June 2006.

Subjects: Male University students from different colleges who attend the university primary care clinic were included in the study. Weight and Height were recorded, and body mass index (BMI) was calculated for each student, using the equation (weight in kg/ height in meter2).

WHO classification was used for defining overweight (BMI 25-29.9 kg/m2) and obesity (BMI = 30 kg/m2) categories. The statistical analysis was carried out using the statistical software for social science version 11.5.

RESULTS

There were 701 university students in the study, with mean age = 21.7 years. Table (1) The prevalence estimate of overweight was 31%, and the prevalence estimate of obesity was 23.3% in the study group. Table (2)

Table 1. Age distribution of male university students, king Saud University, Riyadh.

Age group	Frequency	Percentage %
18- < 22	299	42.7
22- < 26	380	54.2
≥ 26	18	2.6
Unknown	4	.6
Total	701	100

Table 2. overweight and obesity among 701 male University students, king Saud University, Riyadh, Saudi Arabia.

Body Mass Index(BMI)	**No. of students**	**Percentage**
Normal < 25	321	45.8%
Overweight 25-<30	217	31%
Obesity ≥30	163	23.3%
Total	701	100%

DISCUSSION

Obesity is now a major public health problem across the world. Easy solutions are unlikely, given the complex interaction between the abundant availability of energy dense food, the ever-decreasing demand for energy expenditure in the modern world, and the impact of genetic make up. Treatment of people who are already obese is difficult; however, systematic reviews in recent years have shown that diet, exercise, and behavioural approaches, used in combination, are effective management strategies, at least in the short term.(14) Obesity has a negative impact on the self-esteem of children and adolescents, which may have significant implications for long-term happiness and success in life.(15) Efforts to reduce the socioeconomic and psychosocial burden of obesity in adult life should focus on prevention of persistence of obesity from childhood into adulthood.(16,17,18) The present study showed that 31% of the study sample from King Saud university students in Riyadh, Saudi Arabia were overweight i.e. their body mass index (BMI) was 25-< 30 kg/m2 , and 23.3% of the university students were obese i.e. their body mass index (BMI) was more than or equal to 30 kg/m2, while only 45.8% of the university students had normal body weight i.e. their body mass index (BMI) was less than 25 kg/m2 . This emphasizes the importance of prevention of overweight and obesity from early childhood. Treatment of obesity in adults is notoriously frustrating for patients and physicians alike, and it rarely meets with long-term success. Thus, prevention is the best hope for decreasing the prevalence of overweight and obesity.(15) Furthermore, excessive weight during adolescence predicts a number of adverse effects on health later in life, including increased morbidity and mortality.(19,20,21,22) while prevention of overweight and obesity remains a key objective the development of effective strategies to help overweight and obese adults to lose weight and to maintain or improve the achieved weight loss, is currently a critical need.(22) In conclusion: prevention of overweight and obesity health problems among university students should be planned in early childhood.

Comprehensive effective strategies to help overweight and obese university students to lose weight and to maintain or improve the achieved weight loss is a priority health need. Improving University student's awareness about overweight and obesity health problems is an essential step towards decreasing the prevalence of overweight and obesity among university students and in the community.

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CT scan role in diagnosis of acute appendicitis - pilot study

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Key words: appendicitis, CT scan.

ABSTRACT

Background: Clinical diagnosis of appendicitis is usually made on the basis of history, physical examination and laboratory studies. Approximately 20% of patients with suspected appendicitis present with atypical findings. CT has been used to establish diagnosis for patients with suspected acute appendicitis. The purpose of this study was to determine the diagnostic accuracy of CT protocol in patients with suspected acute appendicitis. CT scans obtained when patients presented with right lower quadrant pain and the clinical impression was equivocal for appendicitis were evaluated. Of 124 patients referred for CT, 96 patients subsequently underwent surgery. Appendicitis had been correctly predicted in 88 of 96 patients surgically proven to have appendicitis. CT in the diagnosis of acute appendicitis had a sensitivity of 95%, specificity of 93%. If no definite inflammatory changes are detected, CT is the optimal technique to detect acute appendicitis in those patients.

Objectives: The purpose of our study was to determine the incidence of acute appendicitis in patients for whom the CT scan interpretation is deemed equivocal.

Materials and methods: Of 124 patients with suspected appendicitis referred for CT scan between January 2005 and October 2006, patients were identified in whom the clinical findings were equivocal. Appendiceal size was assessed as well as the presence of signs of appendicitis. The findings were correlated with surgical histopathology reports.

Results: CT Scan had a sensitivity of 95 percent, and a specificity of 93 percent and an overall accuracy of 92 percent.

Conclusion: Helical CT has been shown to be an excellent imaging tool for differentiating appendicitis from most acute gynecological conditions, thus challenging the use of ultrasonography in women. It has a diagnostic accuracy rate for acute appendicitis of more than 92 percent. The accuracy of CT relies in part on its ability to reveal a normal appendix better than ultrasonography. However, when the appendix measures less than 9 mm alone, the likelihood of appendicitis is much smaller.

INTRODUCTION

The purpose of this study was to evaluate the diagnostic accuracy of the spiral-CT in patients with clinically suspected acute appendicitis and to determine the impact on patient management and overall costs and to exclude or confirm appendicitis in patients who presented with equivocal symptoms and signs of appendicitis, such as surgery for pain in the right lower quadrant of the abdomen, remains a clinical dilemma.

Appendiceal computed tomography was performed in 124 consecutive patients with acute appendicitis in the differential diagnosis, and whose clinical findings were insufficient to perform surgery or to discharge from the hospital. The primary CT criteria for diagnosing acute appendicitis was the identification of an appendix with a transverse diameter of 7 mm and larger with associated periappendiceal inflammatory changes (Table 1).

However, appendicitis was not diagnosed in such patients unless an enlarged appendix was definitely identified. Final diagnoses were established by surgical or clinical

follow-up and were compared with the original CT reports.

METHODOLOGY

Appendiceal computed tomography was performed in 124 consecutive patients with acute appendicitis in the differential diagnosis, whose clinical findings were insufficient to perform surgery or to discharge from the hospital. Each scan was obtained in a single breath hold from the lower abdomen to the upper pelvis using a 5-mm collimation. Computed tomography results were correlated with surgical and pathologic findings after appendectomy or clinical follow-up. The criteria used to diagnose acute appendicitis were: (a) a thickened appendix of more than 7 mm or (b) inflammatory changes in the periappendiceal fat. If the CT findings were negative for acute appendicitis and surgery not performed, the results were correlated with other corroborating diagnostic investigations or clinical follow-up. Computed tomography signs of acute appendicitis included fat stranding (100%), enlarged appendix (> 7 mm) (97%), adenopathy (55%), appendicoliths (30%), abscess (7%), and phlegmon (12%)-(Table 3). tomography (92% sensitivity, 93% specificity).

Appendiceal spiral-CT was performed in 124 patients (51 women and 73 men) with clinically suspected acute appendicitis. Scans were obtained from the L4 level to the symphysis pubis using 5 mm collimation without i.v., oral, or rectal contrast material. Prospective diagnoses based on CT findings were compared with surgical (and histopathological) results and clinical follow-up. The effect of spiral-CT on patient management and clinical resources was assessed. Patients with negative CT findings were followed up clinically.

RESULTS

Eighty-eight of the 96 patients with acute appendicitis were correctly diagnosed by computed tomography, and 26 of the 28 patients (93%) without acute appendicitis were correctly diagnosed by computed tomography. Computed tomography signs of acute appendicitis included fat stranding (100%), enlarged appendix (> 7 mm) (97%), adenopathy (55%), appendicoliths (30%), abscess (7%), and phlegmon (12%) (Table3). Appendicitis was diagnosed by CT in 96 patients. Acute appendicitis was identified during surgery in 88 patients (89 per cent). Prospective interpretation of CT images yielded a sensitivity of 92 per cent and a specificity of 93 per cent for the diagnosis of acute appendicitis. There were eight false-negative scans. In 26 of 28 patients without signs of appendicitis on CT, the scan established negative signs for appendicitis or the presence of other pathology. A total of 124 patients were scanned, of which 28 were excluded (Table 4). Of the total final there were 88 true positives, 26 true negatives, 8 false negatives and no false positives, (51 women and 73 men) underwent appendectomies. The normal appendix was identified in most of the cases. The negative findings included torsion ovarian cyst (two patients), urinary tract disease (three patients), mesenteric lymphadenopathy (two cases), and one case was negative.

DISCUSSION

Appendicitis is a disease afflicting young patients. Appendicitis affects 1 in 500 people each year. Appendicitis should be considered in any person with undiagnosed abdominal pain. The incidence peaks between the ages 15 and 24. The concept is that right lower quadrant pain in women of childbearing age is a more complex clinical problem than in men. Women have historically had higher rates of negative laparotomy (1). Anderson reported decreased diagnostic accuracy for appendicitis among women, particularly in the third decade of age (2). The need for improved diagnostic testing in the evaluation of patients with appendicitis is suggested by this study, both from the perspective of the delay encountered in women as well as the extremely high perforation rate in men. A variety of approaches have been investigated including ultrasound, WBC scanning, helical CT, clinical scoring systems, and neural network (3).

Clinical diagnosis of appendicitis is usually made on the basis of history, physical examination (Table 2) and laboratory studies, but approximately 20-35% of patients with suspected appendicitis present with a diagnostic dilemma (4) mainly in the extremes of life, and in ovulating females and young children. There is a high incidence of a false negative appendectomy rate in the pediatric population and it reaches up to 25 %(4).

The appendix is obstructed by a fecal concretion in 50-80% of all cases. The position of the appendix is retrocecal or retroperitoneal in 30% of the cases and intraperitoneal in 70% of the cases.

In retro peritoneal appendicitis, the inflammation invades retroperitoneal fat and can permeate fasciae and fatty tissue by means of inflammation, which eventually leads to abscess formation. In intraperitoneal appendicitis, the inflammation causes localized adhesion of peritoneal membranes and intraperitoneal abscess(5). Radiological examination can reduce the number of misdiagnoses and negative laparotomies and help in treatment of appendiceal abscesses and in post-operative complications.

Continuous improvements in technology, technique and interpretation achieved over the past 15 years have increased the accuracy of imaging methods substantially.

CT has gained acceptance as a primary imaging technique for acute appendicitis by virtue of its ability to image the appendix ,adjacent fat and gut directly.(8) CT for suspected appendicitis is a widely accepted technique because CT examinations are rapidly performed and are usually straightforward to interpret by radiologists with varying degrees of experience from residents (9) to more subspecialized abdominal radiologists. All these features have led to a steady increase in use of appendiceal CT (10-11).

The radiation exposure is the main disadvantage of using CT technique. While the sonographic disadvantages are that they are operator dependant for which intestinal peristalsis, iliac artery pulsations, deep respiration in a non-cooperative patient may give a false impression, and difficulty in maintaining the probe at the same location for a long time, is another disadvantage (8).

With a high resolution CT, an abnormal appendix can be observed and variable CT findings can be evaluated in patients with acute appendicitis(Table 1)(6). The mortality rate in appendicitis is about 1%.

The differential diagnosis includes :colitis, gastroenteritis, small bowel obstruction, duodenal ulcer, pancreatitis, intussusception, Crohn's disease, mesenteric lymphadenitis, pancreatitis, ovarian torsion, urinary tract problems, and pelvic inflammatory disease. The prognosis is more serious if there is perforated appendicitis. In such a case, the patient may require more extensive surgery and antibiotics, and the convalescence is much longer.

In infiltrative phases, the normally readily demonstrable retrocecal fatty tissue is seen on CT scan as a streaky, reticulated area which becomes more demarcated when abscesses are present.

A retrocecal appendix can sometimes be identified as a finger shaped soft tissue structure. Calcified densification corresponding to fecal concretion may be seen in the central region. Intraperitoneal abscesses are fluid collections that are demonstrated as sharply marginated, hypodense areas. While the masking of the surrounding fat is initially less pronounced, the amount of masking can increase as the disease progresses. Protracted processes can cause wall thickening in the pole of the cecum.(5).

Contrast studies are not necessary in reaching a diagnosis nor is there any value in performing an ultrasound examination in acute appendicitis(6) but it is of value in demonstrating complications or an alternative diagnosis.

Appendicular abscess appears as a well -demarcated fluid collection in the right lower quadrant of the pelvis, while appendicitis appears as a dilated, thickened wall appendix or ceacum with periappendicular edema and "dirty fat" may be present(7).

Prompt diagnosis of appendicitis ensures timely treatment and prevents complications. Obvious cases of appendicitis require urgent surgical consultation.

CONCLUSION

* The use of spiral computed tomography in patients with equivocal clinical presentations suspected of having acute appendicitis lead to a significant improvement in the preoperative diagnosis and a lower negative appendectomy rate.

*Helical CT has been shown to be an excellent imaging tool for differentiating appendicitis from most acute gynecological conditions, thus challenging the use of ultrasonography in women. The accuracy of CT relies in part on its ability to reveal a normal appendix better than ultrasonography.

* When the appendix measures less than 9 mm alone, the likelihood of appendicitis is much smaller

*Non-contrast CT is an accurate, reliable and efficacious method in the diagnosis of acute appendicitis and it has the advantage of showing other pathologies mimicking the symptoms of acute appendicitis

* Appendiceal computed tomography is an accurate, reliable and a safe technique to diagnose or to exclude acute appendicitis even if performed in daily routine scanning; on the other hand it can improve medical care and reduce the overall costs for patients suspected of having acute appendicitis.

CT is highly accurate for diagnosing acute appendicitis in both men and women, although there was a slight decrease in sensitivity in thin women.

Developing experience with the technique and understanding the subtleties of interpretation can further improve diagnostic accuracy.

Table 2: Key clinical, historical, and physical examination parameters.

	Male =73	Female=51
Age (years)	24	27
Temperature (centigrade)	37.5	37.8
WBC1000/mm3)	13.500	15000
Nausea%)	75%	85%
Vomiting%)	55%	65%
Diarrhoea (%)	18%	16%
Anorexia (%)	100%	100%
Rebound tenderness	60%	51%
Localized tenderness (%)	100%	100%

Table 3. Results of CT Scan findings in patients proved to have acute appendicitis

CT Scan findings in patients proved to have acute appendicitis.	Number of patients found to have acute appendicitis (Total 88 patients).	Percentage of patients (%)
Fat stranding	88 patients	100%
Enlarged appendix >7 mm	85 patients	97%
Adenopathy	48 patients	55%
Appendicolith	26 patients	30%
Abscess	6 patients	7%
Phlegmon	10 patients	11%

Table 4. The CT Scan accuracy rate in patients with suspected acute appendicitis.

Patients suspected to have appendicitis	Patients referred for surgery	Patients excluded from surgery	Total number
Clinical and CT diagnosis	96	28	124
CT Scan proved appendicitis	88	26	114
Accuracy rate	92%	93%	92% (overall accuracy rate)

Table1. CT scan findings suggestive of Acute appendicitis (Reference #3).

CT scan findings suggestive of Acute appendicitis*

Abnormal appendix:
Distended lumen (appendix equal or >7 mm in diameter).
circumferential wall thickening
target sign
appendicolith
Distal appendicitis

Peroappendicular inflammation
Linear streaky densitities
Subtle clouding of the mesentery
Local fascial thickening
Free peritoneal fluid
Mesenteric lymphadenopathy

Circumferential/focal cecal apical thickening:
Arrowhead sign

Perforation of the appendix:
Nonvisualization of the appendix
Phlegmon
Abscess
Appendicolith
Extra luminal air
Marked ileocecal thickening
Localized lymphadenopathy
Peritonitis
Small bowel obstruction

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Bridging the gap with the integration of conventional and complementary medicine

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INTRODUCTION

The costs of medical care continue to spiral in developed countries. The situation is unlikely to get better in the future, with further technological developments such as gene therapies, new drug classes, immunodiagnostic and therapeutic devices in the midst of an ageing population that will consume an ever-greater proportion of health care resources. Yet, according to integrative doctors such as Professor Avni Sali, there appear to be justifiable concerns about whether these burgeoning health care costs are actually delivering better health outcomes for our community. In addition, evidence is mounting that a more wholistic approach to primary care, integrating complementary medicine with conventional practice has great potential to reduce both these problems.

Complementary medicine may be defined as 'diagnosis, treatment and/or prevention that complements mainstream medicine by contributing to a common whole, by satisfying a demand not met by orthodoxy and by diversifying the conceptual frameworks of medicine.' [1] The term 'alternative medicine' tends to indicate that it is not integrated with mainstream medicine and that the patient must choose one or the other. The term 'complementary medicine' is preferable, as it promotes a cooperative relationship leading to improved health care for an individual patient.

General practice can learn from complementary medicine. A survey in the UK [2] found that patients chose complementary medicine for four main reasons:

- Dissatisfaction with conventional medicine
- Lack of holism in conventional medicine
- A greater sense of self-control

Support in chronic illness.
While GPs are trained and encouraged to provide this approach to all their patients, the statistics would indicate that many GPs can improve in these areas by undertaking further education and training and by accessing appropriate resources to improve their understanding of appropriate applications of complementary medicine as well as limitations and potential dangerous interactions.

THE TRENDS

The trend towards integrating evidence-based complementary medicines into conventional medicine is growing in the western world.

In 2001, the Royal Australian College of General Practitioners (RACGP) survey showed that, 43% of urban and 43% of rural patients reported attending complementary medicine practitioners. [3] While some forms of complementary medicine have been around for centuries, there have been substantial changes in its scientific base and organisational structure. Such changes have led to increasing integration with conventional medicine. A potential result of this change is that similar clinical, scientific and regulatory standards could be applied to all forms of primary health care.

It is now recognised that public spending on complementary medicines within developed nations far exceeds the patient contribution for all pharmaceutical medications. [5] These trends are consistent in the United States, which suggests that use of complementary medicines is increasing. Between 1990 and 1997 expenditure on these therapies in the US increased by 45.2%, with the total of over US$21 billion exceeding out-of-pocket expenditures for all US hospitalisations. Furthermore, visits to practitioners of complementary medicine exceeded the total of visits to all US primary care physicians. [6]

Similarly, use of complementary medicines by Australian General Practitioners (GPs) is increasing. Surveys have estimated that between 30-40% of GPs practice a complementary medicine and over 75% formally refer their patients for such medicines. [7,8] It is also estimated that over 80% of Australian GPs think it appropriate for GPs to practice therapies such as hypnosis, meditation and acupuncture and that most GPs desire further training in various complementary medicines. [8] This interest is supported by the forming of links between the Australasian Integrative Medicine Association, the Royal Australian College of General Practitioners and the Australian Medical Association's Advisory Committee on Complementary Medicine as well as the introduction of teachings in complementary medicine in undergraduate medical courses and the development of new postgraduate courses to train doctors in various modalities.

The increased interest in complementary therapies by both doctors and patients is paralleled by an increasing support for these therapies by government. In Australia, the government has provided these therapies with formal recognition by establishing an Office of Complementary Medicine as part of the Therapeutic Goods Administration, and the Victorian Government is the first outside of China to regulate the practice of traditional Chinese medicine.

Australian Institute of Health and Welfare statistics show that Australians spend around $1 billion annually on complementary medicines which include vitamin supplements, homeopathic medicines and traditional Asian and indigenous medicines.

In November 2006, the Australian Commonwealth Government announced a $5 million funding program through the National Health and Medical Research Council (NHMRC) to investigate the use and effectiveness of complementary medicines. [11]
This new funding is in addition to the Commonwealth Government's recent $529 million investment in NHMRC grants for health and medical research.

THE COST OF COMPLIMENTARY MEDICINE

In the USA, individuals spend more than US$35 billion on complementary medicines. This includes herbal, vitamin and diet products, relaxation therapy, massage, spiritual healing, self-help groups, folk remedies, homeopathy, hypnosis, biofeedback, acupuncture and books and classes.

About 58% of Americans who used complementary medicines treatments paid for these services themselves, since they were not covered by health insurance or health maintenance organisations. [12]

Nearly 60% of people using complementary medicines were seeking to prevent illness or maintain health; only 42% were using complementary medicines to treat an illness. Chronic conditions such as back and neck problems, anxiety, arthritis and headaches were the most common reasons given for using these medicines. As in Australia, those who used complementary medicines in the USA were mainly female with a university education, aged 35-49 and of higher socioeconomic status.
The total spends on complementary medicines and therapies in Australia are in excess of $2.3 billion per annum.

THE IMPACT TO PROFESSIONAL PRACTICE

Despite moves to support complementary medicines, it often seems that there are two healthcare systems- conventional and complementary that operates in parallel without much interaction. It is estimated that out of the patients who go to complementary practitioners, over 70% do not inform their doctor they are doing so.[9] This lack of communication about complementary medicines is potentially hazardous as it raises the possibility of treatment interactions and indicates a deficiency in the doctor-patient relationship. This is even more significant when it is considered that 83% of people seeking complementary treatment for "serious medical conditions" were found to be receiving treatment from a medical doctor for the same condition. [9]

The term "integrative medicine" can be seen to describe medical practice that aims for a balance between its complementary aspects. Thus, integrative medicine balances art and science, supportive and curative therapies and aims for a true partnership model whereby the practitioner avoids a paternalistic attitude and fully involves the patient in decision making and the implementation of their therapy. As well as describing medical practice that is balanced, the practice of integrative medicine can also be seen to involve principles for choosing between different interventions. Thus, "complementary medicines" may be integrated into medical practice by considering principles that include the Hippocratic ethic of "first do no harm", respect for patient autonomy and informed consent as well as the treatments practicality, cost effectiveness, evidence of efficacy and applicability. When medicine is practiced by applying a consideration of these principles in the full context of a person's life, it may be said to be "wholistic".

With integrative medicine becoming widely supported, the achievement of a truly integrated practice requires collaboration across all medical disciplines as well as support from government and professional organisations. This is slowly happening and recently organisations such as the Australian Medical Council have stated that a "wholistic, integrative approach is a prerequisite for best orthodox practice" [10] and the RACGP have advocated a "whole-person, integrated approach". Certainly, the practice of integrative medicine is fully compatible with current best practice and it is likely that in the future this type of practice will be simply considered "good medicine".

It is therefore obvious that health professionals can no longer ignore the rising interest in complementary medicine by their patients.

THE DILEMMAS FOR THE HEALTH PROFESSIONAL

The growth of complementary medicine poses a range of dilemmas for the medical profession.

GPs are mainly involved in doing short consultations, where they write prescriptions, order investigations and refer to specialists. There is an enormous opportunity for doctors to expand their services by offering scientifically validated complementary medicine modalities in their treatment armamentarium.

It is essential that doctors, especially GPs but also specialists, have some understanding of what, on average one-half of their patients are doing. Doctors who are familiar with complementary medicine modalities can be regarded a more completely educated in general medicine and are more likely to discuss complementary medicine options with their patients in a non-judgemental way.
Doctors will be better able to serve their patients by integrating the science of conventional medicine with the science of complementary medicine. It is becoming increasingly more necessary for doctors to be educated in integrative medicine; otherwise their patients will go elsewhere. In fact, not only in the USA but in Australia, it is reported that more members of the public visit a complementary medicine health professional than a doctor.

There are, however, clear pointers about the way in which the profession may start to come to terms with the area.

It is important to recognize that complementary medicines and some therapies are well established and increasingly being used by the public. It is expected that such use will continue to increase.

Evaluation of a range of complementary medicines and therapies is currently being carried out by researchers using scientific methodology. In the near future, evidence based use of such medicines and therapies will be supported by high quality research. At the same time, training in certain complementary therapies will be increasingly undertaken by universities and integrated into medical education.

This was emphasised by the Australian Medical Association (AMA), past Federal President, Dr Kerryn Phelps at the AMA National Conference 2001.

"..as evidence emerges that some complementary medicines are effective, then it becomes ethically impossible for the medical profession to ignore them.

The basis of judgement must be on the basis of evidence concerning safety, quality and efficacy. If such products are being widely used then it becomes dangerous to ignore the potential beneficial or adverse effects when used in conjunction with mainstream (conventional) medicines or in conjunction with other herbs. On the other hand, if the evidence does not support the use of particular complementary medicines to therapies, it is crucial that consumers and practitioners - both mainstream and complementary - are informed." [13]

Practitioners must be aware of both situations in which complementary medicines provide potential benefits to patients as well as those where there may potentially be adverse reactions or interactions with prescription drugs. Complementary medicines must be judged on an evidence basis and medical practitioners can no longer make judgments based on prejudice either for or against complementary medicine.

EDUCATING THE INTEGRATIVE DOCTOR

Throughout Europe, complementary medicine has been very popular in the community and also the medical profession. Several of these medicines, especially herbal medicine and homeopathy, are a significant part of medical practice in Europe and have been established for many years.
There has been a gradual introduction of complementary medicine teachings in various medical schools in Australia, Europe and the United States. The British Medical Association has encouraged the incorporation of complementary therapies into the medical undergraduate curriculum and postgraduate training. [14] Furthermore, the British Medical Association is in favour of doctors working with accredited complementary medicine practitioners. The European Parliament is working towards guaranteeing the status of various forms of complementary medicine in the 15 European Union member countries. The Health Ministries of Singapore and Malaysia have established national policy to integrate traditional Chinese medicine within mainstream medical practice for a complete approach to community health care.

THE NEED FOR RESEARCH FUNDING

It is crucial that governments around the world fund research in complementary medicine. We need to find out exactly how much the practice of integrative medicine can save the community. We also need to find out what percentage of patients who see their family doctors do so because they want to prevent illness, and also what percentage of the public consults complementary medicine practitioners compared with consultations with GPs.

The peak body organizations seek with interest the increasing level of scientific research being undertaken in the areas of complementary medicine. Scientific evidence provided by such studies has the potential to lead to further integration of primary health care to the point where patients do not have to make a choice. Patients can then openly discuss any and all potential modes of

diagnosis, treatment and prevention with their GP and complementary medicine practitioner.

SUPPORT FOR THE HEALTH PROFESSIONAL

As indicated in this article, the implementation of integrative medicine in professional practice presents a number of issues for the health professional so that the best advice and treatment can be provided to the patient.

Below is some valuable resources and associations which specialise in integrative medicine that is recommend for all health professionals, educators and students to review for their further reference.

IMgateway.net (www.imgateway.net)

IMgateway is currently accessed by over 6,000 General Practitioners, Allied Health Professionals and students, including the following leading organisations, Australasian Integrative Medicine Association (AIMA), Medical accredited medical education providers, the Western Australian General Practice Education and Training organisation (WAGPET), the Victorian Metropolitan Alliance (VMA), Victoria Felix (VicFelix), Epworth Hospital and The Prince Charles Hospital Health Service District.

IMgateway provides members with access to a wide range of flexible and easy-to-use services including-

- Over 3,000 detailed scientific monographs that uniquely present both conventional and
- complementary treatment strategies
- Evidence based information collected from over 3,000 industry-standard sources, including over
- 700 medical and complementary journals
- Regularly updated monographs, which include 350 conditions, 300 herbs, 250 supplements
- drug-nutrient depletions, herb-drug and supplement-drug interactions
- Peer-reviewed information by 90 medical and complementary medicine practitioners
- 3,000 Patient information sheets

In addition, IMgateway is supported by leaders in the field of complementary medicine including:

- Prof Marc Cohen, Department of Complementary Medicine, RMIT University,
- Lesley Braun, Leading consultant/Lecturer & Naturopath/Pharmacist and
- Prof Avni Sali, Director, National Institute of Integrative Medicine.

The Australasian Integrative Medicine Association (AIMA) Inc. (www.aima.net.au)

The Australasian Integrative Medicine Association (AIMA) Inc. is a national, voluntary non-profit organisation. Our members consist of medical practitioners who provide holistic health care for their patients - integrating Western medicine with complementary medicine. Associate members include allied health professionals including physiotherapists, nurses, dieticians, pharmacists and other health professionals. AIMA is officially affiliated with the Victorian AMA (Australian Medical Association) and the Graduate School of Integrative Medicine at Swinburne University and is recognised as a special interest group by the RACGP (Royal Australian College of General Practitioners). AIMA is widely recognised as a responsible authority in holistic, complementary and integrative medicine and as an organisation that has been in existence for over ten years, AIMA has made steady progress in establishing credibility in the field of Integrative Medicine.

AIMA seeks to provide:

- A support network and forum for practitioners interested in integrative medicine.
- Provision of a website including a public referral service.
- A regular international conference.
- Publication of a regular Journal (JAIMA)
- Representation for members to medical institutions (AMA, RACGP, HIC, etc.)
- Promotion of high standards of professional ethics, competence and conduct.
- Networking with medical and government organisations to promote the practice of integrative medicine.
- Facilitation of education through seminars, CME meetings, workshops etc.
- Support for research in integrative medicine.
- Member's benefits such as discounts on annual conference, products, insurance, finance etc

The National Institute of Integrative Medicine (NIIM) (www.niim.com.au)

The National Institute of Integrative Medicine (NIIM) aims to bring together teaching, research and the practice of Integrative Medicine and its allied activities with the objectives of facilitating improved understanding of the utilisation, safety and limitations, evaluation and development of complementary and alternative medicine (CAM) to mainstream medicine. The Institute is the outcome of many years of expertise gathered from the management of the Graduate School of Integrative Medicine (GSIM) originally located at Swinburne University . This Institute has achieved significant support

from researchers and practitioners in a collaborative effort to promote research and education in Victoria and Australia generally on numerous facets associated with Integrative Medicine.

NIIM seeks to expand the original mission of GSIM and achieve the following aims:

- To establish quality assurance teaching programs for medical professionals and other allied health personnel
- To contribute to and support the development of an education and a research culture in CAM which observes the highest ethical standards,
- To facilitate collaborative research into Integrative Medicine, drawing on expertise in CAM and in research methodology,
- To source funding for CAM research and disseminate research findings and to assure students and prospective research industry partners of the highest possible standards, in particular in herbal and other natural medicines,
- To disseminate information about Integrative medicine to those involved with healthcare delivery in all disciplines, researchers, regulatory authorities and the public,
- To establish a wellness clinic that will provide integrative medical care for the best possible health.
- To continue building on our existing education and research activities - to further enhance our innovative reputation.

The NIIM belongs to a network of partners from around the world including Asia, Europe, the Middle East and the United States of America. This network provides the backbone structure of NIIM teaching and research capabilities.

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Excellence of Anti-Tuberculosis Primary Health Care: Paradigm Shift towards Evidence-Based Medicine

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ABSTRACT

There has been an increased pressure in all health care disciplines to provide interventions that are scientific, safe, efficient and cost-effective. Evidence-Based Medicine (EBM) is said to be the current best approach to address these attributes. All health care professionals including Primary Health Care Physicians (PHCPs) need to adopt it. Numerous Primary Health Care (PHC) studies have been carried out to ascertain the attitude towards, knowledge of, engagement in' as well as barriers to practicing EBM. These studies were mostly carried out in the developed countries and almost none in the developing countries.

The overall aim of the present study is to introduce and clarify the concept of EBM to decision makers and PHCPs in order to improve the practice, efficiency, and quality of their performance.

This present study produced three types of surveys. The first survey investigated PHCPs' attitudes towards the concept of EBM. A cross- sectional study was adopted for carrying out this survey. This survey also examined the knowledge that PHCPs possessed that could enable them to be engaged in EBM related activities. In addition, this study explored the barriers that prevented them from practicing EBM. The results indicated that the majority (63.5%) of respondents had a positive attitude towards EBM as they considered EBM to be useful in their day-to-day practice. The results further indicated that the majority of respondents had little knowledge of EBM and also engaged in activities related to EBM. A number of barriers, including lack of time, resources, barriers, misconception about EBM and others were identified in this study that hindered the respondents from practicing EBM. No statistically significant relationship was found between socio-demographic variables and attitude towards EBM.

The second type of survey was designed to build up scientific evidence from primary care research findings (randomized controlled trials) based on the systematic review methodology to identify the strategies that promoted adherence to Tuberculosis (TB) treatment. The results of this survey saw the implementation of six strategies (patient's reminder letters, monetary incentive, health education, peer health advisers, health education plus monetary incentive, and intensive staff supervision). This systematic review of randomized trials found out that all strategies tested seemed to improve adherence.

The third type of survey was designed to explore the opinions of experts in National TB Control Programmes about the ability of applying achieved strategies in our general practice. This was done by the technique of Delphi. The consensus (agreement) was reached in two of these strategies (intensive staff supervision and peer health advisers).

Several recommendations were made to the Ministry of Health, medical education system, medical syndicate, and health research organizations.

METHODOLOGY

Primary Health Care Physicians' Attitude towards EBM

Study Setting - The present study was conducted in the center of Baghdad city, which has two directorates, Al-Karkh and Al-Rusafaa health directorates. The directorate of Al-Kharkh is served by four health sectors, while Al-Rusafaa is served by five health sectors. These health sectors provided health services through Primary Health Care Centers (PHCCs) that were distributed all over the center of Baghdad city, (39) in Al-Kharkh and (44) in Al-Rusafaa.

The total number of physicians served in these PHCCs is (620), (306) in PHCCs in Al-Kharkh and (314) in Al-Rusafaa.

For the purpose of data collection, (41) PHCCs were chosen from the total (83) PHCCs by simple random sampling as a place to carry out the present study and collect the study sample.

Study Design - To achieve the aim of the present study, a cross sectional study design was adopted, in which the center of Baghdad city was divided into two parts Al-Rusafa and Al-Kharkh health sectors.

(Peil et al., 1982) states that a cross sectional study design aims to explore a new area, or at least one about which little is known in the local context. They further report that in an exploratory study, one sets out a few preconceptions to examine a phenomenon from many point of views, looking for new ideas and insights that will not only explain what is happening but also what is hindering the acceptance of new technique. From both sectors (41) PHCCs were chosen by simple random selection.

METHODS

Sample technique - The unit of the present study was a physician who was present at the time of conducting the survey of the sampled PHCCs.

Data was obtained directly from physicians themselves through detailed questionnaire from (Appendix I) prepared and given to the physicians present in the selected PHCCs.

The questionnaire form was completed by physicians themselves during the time of work.

Preliminary Preparations:
A review of literature relevant to attitudes of physicians towards EBM was carried out. The preliminary questionnaire form was constructed.

Before applying the questionnaire form and in order to construct a final, suitable, and formative form, a pilot study was undertaken.

Pilot Study
A pilot study was carried out to set up the data collection before being finally applied to the study sample.

The main objectives of the pilot study were:
1) To indicate what kind of difficulties are likely to be met.
2) To examine the design of the questionnaire form, and to assess its reliability (repeatability) in order to reveal any necessary modifications.
3) To determine the time needed by the physicians to complete the questionnaire form, to determine how many PHCCs could be examined on average.
4) To test the response rate of the physicians.

The pilot sample was collected in April, 2006. It consisted of 25 physicians selected from 4 PHCCs on a non-randomized basis. In order to assess the reliability of the information that was derived from the physicians, the pilot sample was interviewed by using a test and re-test approach in which 25 physicians were re-tested again 1 week after conducting the pilot test .

In view of the pilot study, the following points were obtained:

1) The response rate of physicians was (100%).
2) To evaluate the reliability of the questionnaire form, the reliability (repeatability) index was calculated (Gorid, 1996), which was the percent agreement in physician response during test and re-test occasions. The frequency distribution of positive/negative responses and results of analysis of both test and re-test interviewed physicians, were demonstrated in Table (2.1), in which the calculated reliability index was (83.3%) which indicated that the form was adequate and reliable.

Table (2.1) Frequency distribution of positive/negative responses during the pilot study and results of both test and re-test of physicians.

		Test		
		Physician's response		
		+ve	**-ve**	**Total**
Re-test	+ve	20	2	22
	-ve	3	5	8
	Total	23	7	30

Reliability =Total agreement/ total number ×100
= (20+5)/30×100
=83.3%

Sampling Frame and Technique
Sampling Size Determination:

The total population of 620 physicians enrolled in PHCCs was considered as a background.

The desired sample size for this study was 50% of the total population.

Determination of the Number of Sampled PHCCs:

The total number of PHCCs present in both parts of Baghdad City were (81) PHCCs.

As the desired sample size of this study was 50% of total population pollution, (620) served in these (83) PHCCs. So by simple random sampling, (41) PHCCs were taken from these total (83) PHCCs.

Sample Selection:
The number of physicians per PHCC varies between 5-10 physicians per PHCC.

The number of physicians needed to complete this present study was (310) physicians, 50% of the total population of (620) physicians.

As we select (41) PHCCs by simple random sampling, belong to both areas, all physicians present in these (41) PHCCs were included in this present study.

Data Collection Tool:
A combination of questions from two published questionnaires was used to determine attitudes, knowledge, engagement and barriers towards EBM (Fritsche et al., 2002; and McColl et al., 1998b) were used to construct the questionnaire used in this study. The validity and reliability of the questionnaire developed by Fritsche et al is documented, while McColl et al used literature and previous focus:

Primary Health Care Physicians' Attitude towards EBM

Study Population:
During the study period, 334 questionnaire forms were distributed in (41) PHCCs in both parts of Baghdad City.

Table (3.1) Total number of distributed questionnaire forms and number of included forms in the present study.

Number of questionnaire distributed forms	Completed forms	Incomplete forms
334	296	38

In the present study, PHCCs participation rate was 100%. Overall physician's response rate 88.6%.

Demographic Determinants of the Study Population:
Table (3.2) reveals that among 296 physicians who completed the questionnaire form, 181 were male and 115 female, M/F ratio was 1.3:1.

The age of study subjects were: 11 physicians less than 30 years, 93 physicians between 30-39 years, 149 physicians between 40-49 years, 37 physicians between 50-59 years, and 6 physicians more or equal to 60 years; also among study subjects 0% had a doctorate, 4% a master degree, 8% a diploma, and 88% had M.B.Ch.B.

RESULTS

Table 3.2. Demographic characteristics of study population.

Characteristics	Study Subjects
Age < 30 years 30-39 40-49 50-59 ≥ 60	11 93 149 37 6 Total 296
Gender's/F	181/115 1.3:1
Certificate -Doctorate -Master -Diploma -M.B.Ch.B.	0 0 % 12 4 % 25 8 % 259 88% Total 296

Attitude towards EBM:
Physicians' Attitude towards the Current Promotion of EBM.

Table (3.3) illustrates physician's attitude towards the current promotion of EBM, (3%) extremely welcoming, (65%) welcoming, (17%) neutral (neither welcoming nor unwelcoming), (13%) unwelcoming, and (2%) extremely unwelcoming.

Table (3.3) Physician's attitude towards the current promotion of EBM. Values are numbers (percentage) of subjects who ticked each response.

Physicians' attitudes	Number of Physicians	
Extremely welcoming	9/296	3%
Welcoming	192/296	65%
Neutral	51/296	17%
Unwelcoming	38/296	13%
Extremely unwelcoming	5/296	2%

Physician Use of EBM in Practice:
Table (3.4) illustrates the percentage of physicians who feel that clinical practice is currently EBM, 0% of physicians is 100% use of EBM in practice, 0% is 75% use of EBM in practice, 0% of physicians is 50% use of EBM in practice, 11.5% of physicians is 25% use of EBM in practice, and 88.5% of physicians is 0% use of EBM in practice.

Table (3.4): The percentage use of EBM in practice by study physicians, values are numbers (percentage) of subjects who ticked each response.

Percentages of use of EBM in practice	Number of physicians %	
100 %	0/296	0%
75 %	0/296	0%
50%	0/296	0%
25%	34/296	11.5 %
0 %	262/296	88.5%

Practicing EBM Improves Patient Care

Table (3.5) illustrates the attitude of physicians that practicing EBM improves patient care, (6.4%) of physicians strongly agreed that practicing EBM improves patient care, (63.2%) of physicians agreed that practicing EBM improves patient care, (19.6%) neutral, (10.8%) disagreed that practicing EBM improves patient care.

Table (3.5): Physicians' attitudes that practicing EBM improves patient care. Values are numbers (percentage) of subjects who ticked each response.

Physicians' attitudes	Number of physicians %	
Strongly agree	19/296	6.4%
Agree	187/296	63.2%
Neutral	58/296	19.6%
Disagree	32/296	10.8%
Strongly disagree	0/296	0%

EBM is of Limited Value in General Practice because much of Primary Care Lacks a Scientific Base:

Table (3.6) illustrates the physician's attitude towards this statement (28.4%) strongly agreed with it (40.2%) agreed with it, (23.6%) neutral, (7.8%) disagreed with it, (0%) strongly disagreed.

Table (3.6) Physician's attitude that EBM is of limited value in general practice because much of primary care lacks a scientific base. Values are numbers (percentage) of subjects who ticked each response.

Physicians' attitudes	Number of physicians %	
Strongly agree	84/296	28.4%
Agree	119/296	40.2%
Neutral	70/296	23.6%
Disagree	23/296	7.8%
Strongly disagree	0/296	0%

Usefulness of Research Findings in Day-to-Day Management of Patient:

Table (3.7) illustrates the physician's attitude towards the usefulness of research findings in day-to-day management of patients; (1.7%) were extremely useful, (61.8%) were useful, (23.6%) were neutral, (11.8%) were useless, and (1%) were totally useless.

Table (3.7): Physicians' attitudes towards the usefulness of research findings in day-to-day management of patient care. Values are numbers (percentage) of subjects who ticked each response.

Physicians' attitudes	Number of physicians %	
Extremely useful	5/296	1.7%
Useful	183/296	61.8%
Neutral	70/296	23.7%
Useless	35/296	11.8%
Totally useless	3/296	1%

The Way for Moving from Opinion Based Practice towards EBM:

Table (3.8) illustrates the three different ways for moving from opinion-based medicine towards EBM,
a) By learning the skills of EBM i.e. to identify and appraise primary literature or systematic review on self;
b) By seeking and applying evidence-based summaries which give the clinical ''bottom line''; such summaries may be obtained from abstracting journals;
c) By using evidence-based practice guidelines developed by expert colleagues for use by others.

The answer of the question, which one of these methods you are using, please tick one or more ways. The answer for way (a) was 19, for way (b) was 24, for way (c) was 15.(Table 3.8)

The answer of the question which one of these methods you would be interested in using in the future, please tick one or more boxes, the answers were: For method (a) 53, for method (b) 246, for method (c) 167.(Table 3.8)

The answer of the question which one of these methods do you think is the most appropriate in General Practice, tick one box. The answers were: 15 for method (a), 153 for method (b), 128 for method (c). (Table 3.8)

Table (3.8): The ways for moving from opinion-based practice towards EBM. Values are numbers (percentages) of physicians who ticked each response.

Question	Method (a) By learning the skills of EBM i.e. to identify and appraise the primary literature or systematic review on self	Method (b) By seeking and applying evidence based summaries.	Method (c) By using EB practice guidelines developed by expert colleagues for use by others.
Which one of these methods are you using? (tick one or more boxes)	19	24	15
Which one of these methods would you be interested in using in the future? (tick one or more boxes)	53	246	167
Which one of these methods do you think is the most appropriate in General Practice? (tick one box only)	15 5%	153 51.7%	128 43.3%
*Some respondents did not answer all questions.			

Major barriers to practicing EBM in General Practice:
Table (3.9) illustrates the perceived major barriers to practicing EBM in general practice reported by 296 physicians; 215 responses were the lack of personal time and work overload, 167 responses for the physician's misconception about EBM; 134 responses for the resources barrier, 96 responses for evidence itself, 76 responses for patient related factors, and 43 responses for organization barrier.

Figure (3.1) shows the distribution of these barriers according to their frequencies.

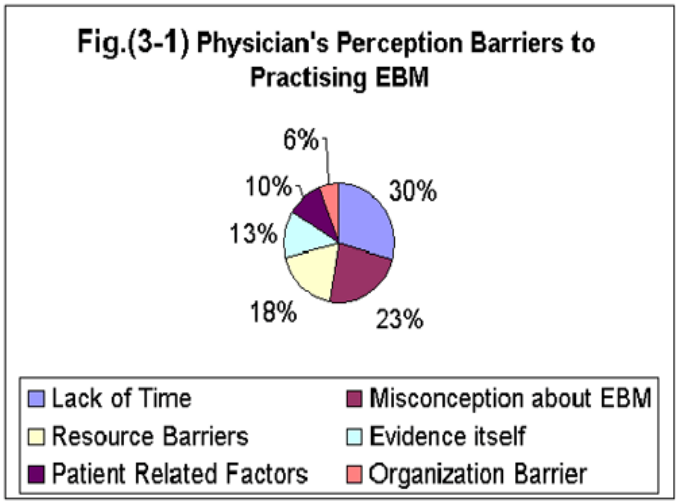


Table (3.9): Perceived major barriers to practicing evidence-based medicine in general practice reported by 296 physicians.

Perceived barrier	No. of responses
	215
	167
	55
	43
Lack of personal time and work overload.	25
Physician's misconception about evidence-based medicine:	
-EBM ignores clinical experience and clinical intuition.	23
-EBM ignores standard aspects of clinical training such as physical examination.	19
-EBM has been developed for cost containment reasons and is externally imposed.	
-EBM is limited to clinical research.	
-A combination of thorough traditional medical training and common sense is sufficient to allow one to evaluate new tests and treatment.	11
-Understanding of basic investigation and path physiology plays no part in EBM as it depends mainly on intervention.	
	134
Resource barrier:	41
-Lack of computers and software.	30
-Lack of internet.	28
-Lack of professional journals.	19
-Lack of publications.	11
-Lack of presentations.	5
-Lack of EBM guidelines production.	96
Evidence itself	96
Access to evidence and critical appraisal of the evidence.	76
Patient related factors:	44
-Ignored media.	21
-The need for lengthy discussion.	11
-Treatment request.	43
Organization barrier:	23
-Lack of investment by health authorities.	20
-No emphasis on continuous medical education.	
*Respondents give more than one response.	

Awareness and Perceived Usefulness of Relevant Information Source:

Table (3.10) shows that the physicians had low level of awareness of extracting journals, review publications and databases relevant to EBM. Only 12.2% of respondents were aware of the Cochrane Database of Systematic Review, 19.8% of Bandolier, and 25.6% Evidence-Based Medicine (BMJ publishing group). Less than 1% used any of these resources in clinical decision-making.

Table (3.10) Awareness of 296 physicians of extracting journals, review publication, and databases relevant to evidence-based medicine and their usefulness. Values

are numbers (percentages) of subjects who ticked each response.

*Some respondents did not answer all questions.

Figure (3.2) shows the extremes of awareness of evidence-based resources in 296 PHCPs. Those that used Bandolier, Effective Health Care Bulletin, and Database of abstract and Evidence-Based Purchasing are 0.7%, 1%, 0.7%, 0%, 0%, and 0% respectively. While those that were unaware of mentioned resources are 68.1%, 67.5%, 83.7%. 84.8%, 98.2%, and 95% respectively.

3.1.7 Access to the Relevant Databases and the World Wide Web WWW:

Only 14.8 % (42/296) of physicians had access to Medline or other Bibliographic databases, and only 10.4 % (31/296) had some kind of access to the world wide web. In the previous year, 4.4 % (13/296) had consulted Medline or another database for literature searching. Of the respondents, 11.8 %(35/296) reported having training in literature searching, 4.7 % (14/296) attended a course on practicing EBM and only 2.3 % (7/296) attended courses on critical appraisal. On the positive side, almost all of them, 95% (281/296), would like to attend courses relevant to practicing EBM.

Understanding of Technical Terms Used in EBM:
Table (3.11) shows that relative risk, absolute risk, odd ratio, and systematic review were the most technical items that the respondents can understand and explain to others.

Absolute risk, relative risk, systematic review, Meta analysis are the most technical items that the respondent can understand but cannot explain to others.

Respondents show high percent desirability to understand all the technical terms, while low percentage of respondents show that these technical terms would not be helpful to them to understand.

Figure (3.3) shows the percentage of PHCPs that are able to understand and explain technical terms to others. Relative risk, absolute risk, odd ratio, and systematic review are the most term they are able to understand and can explain to others by PHCPs 14%, 13.4%, 12.8%, and 11.1% respectively.

Systematic Review of Randomized controlled Trials of Strategies to Promote Adherence to Tuberculosis Treatment

Study selection
The literature search identified 14 studies of strategies that promoted adherence to TB treatment and were found through electronic database search. The 14 trials were screened according to the criteria mentioned in method section.

Only 5 of the trials met the inclusion criteria. Details of the 5 studies and data extracted for appraisal are shown in (Table 3.12).

Interventions Studied

Interventions examined were patient reminder cards (Paramasivan et al., 1993), patient education (Sanmarti et al., 1993), and an incentive for patients (Pilote et al., 1996), help from peer group through community health workers (Pilote et al., 1996), a combination of patient education and incentive (Morisky et al., 1990), and incentive staff supervision (Jin et al., 1993).

Data Synthesis and Critical Appraisal
The number of participants in each trial ranged from 200 to 1300 patients, who had active tuberculosis (Paramasivan et al., 1993; Morisky et al., 1990; Jin et al., 1993) were contacts of patients with tuberculosis and required prophylaxis (Morisky et al., 1990; Sanmarti et al., 1993) or were contacts of patients with tuberculosis awaiting evaluation for active treatment or prophylaxis (Pilote et al., 1996).

Participants in three of the five studies were disadvantaged - namely, illiterate patients in Madras (Paramasivan et al., 1993), homeless people (mostly men) living in San Francisco, many of whom had a history of drug and alcohol misuse (Pilote et al., 1996); and patients with low income in Los Angeles, most of whom did not have English as their first language (Morisky et al., 1990). Interventions were not always directed as those who were receiving treatment. One study tested interventions on the mothers of children from state and private schools in Barcelona Province who had tested positive for tuberculin (Sanmarti et al., 1993). While another evaluated an intervention directed at the staff of tuberculosis clinics in Korea (Jin et al., 1993).

The commonest measure of adherence was completion of treatment (case holding). However, two trials assessed adherence to appointment keeping (Morisky et al., 1990; Pilote et al., 1996) and two examined the use of drugs (Morisky et al., 1990; Sanmarti et al., 1993). Only one study considered the outcome of treatment.

And this was assessed as the rate of bacteriological conversion in those who initially had positive results on sputum microscopy or culture (Jin et al., 1993).

In one trial, allocation was by case record number and was therefore not concealed Morisky et al., 1990). For the

remaining trials, adequacy of concealment could not be determined and information was also not available on the method used for generation of allocation sequence, with the exception of one study, in which 43 subjects (13.5%) could not be accounted for (Sanmarti et al., 1993).

Loss to follow up was not reported to have occurred. All the studies used an intention to treat analysis. None reported whether those assessing outcome were blinded to the intervention to which patients had been assigned.

Six different strategies to promote adherence were tested in the trials included in this review (Table 3.12). Up to two reminder letters sent to patients with tuberculosis soon after they had defaulted on clinic attendance produced good results. Of the 29 patients who defaulted in the intervention group, 17 (58.6%) returned, compared with 4 out of 31 (12.9%) in the control group. Even among illiterate patients, rates of return were high (Paramasivan et al., 1993).

A monetary incentive ($5 (3)) was highly effective in promoting adherence to an initial appointment for evaluation of tuberculosis among homeless people with positive results on tuberculin testing (Pilote et al., 1996). In the same study, recruits from the homeless community (so called peer health advisers) were paid to help patients keep their appointments, and this intervention was also effective compared with the control group. There was no statistical difference detected between the financial incentive and the peer adviser (Table 3.12).

Health education given to mothers every two months improved compliance with chemoprophylaxis among children positive for tuberculin (Sanmarti et al., 1993). Each of three health education strategies was compared with no health education.

Estimates of the effectiveness of the interventions in promoting attendance at the last clinic visit were better when the nurse visited or telephoned the patients at home than when health education was provided by a doctor at the clinic. The summary relative risk for the health education approaches compared with standard care (leaflet only) was 1.2 (95% confidence interval 1.1 to 1.4). Recent drug use assessed by the presence of a drug metabolite in a urine sample at the last clinic visit was significantly higher in each of the intervention groups compared with the controls.

One study compared a monetary incentive and health education with routine care (Morisky et al., 1990). The proportion completing treatment differed significantly between the intervention and control groups for patients receiving prophylaxis against tuberculosis but not for patients with the clinical disease. As the confidence intervals overlapped substantially, however, no real difference might exist between the two odds ratios. Benefits were also found in terms of the average proportion of appointments kept and the mean proportion of drugs taken in this study.

Finally, an intervention directed at staff in tuberculosis clinics rather than patients, was studied (Jin et al., 1993). Patients with tuberculosis attending health centers with intense supervision of staff were more likely to complete treatment than those attending health canters with routine supervision of staff. The effect of the intervention on bacteriological conversion (cure) rate was also favorable (relative risk 1.7 (1.4 to 1.9)).

Experts Opinions about the Ability of Applying the Strategies that Promote Adherence to Tuberculosis Treatment in our Practice

Survey Result A

This page shows the number of participants who scored each box for each question in both the first and second round questionnaires. Those in the row above are the numbers from the first round while those in the row below are the numbers from the second round. This enables you to see where knowledge of other participants scoring may have influenced participants to change their scoring of some questions between the first and second rounds.

Item One

Up to two reminder letters sent to patients with tuberculosis soon after they had defaulted on clinic attendance produced good results.

	1	3	1	1	0	Totally
Totally disagree	0	5	0	1	0	agree

Item Two

A monetary incentive was highly effective in promoting adherence to an initial appointment for the evaluation of tuberculosis among homeless people with positive results on tuberculin testing.

	1	2	2	1	0	Totally
Totally disagree	2	3	1	0	0	agree

Item Three

Health education given to mothers every 2 months improved compliance with therapy among children positive for tuberculin.

	2	2	0	1	1	Totally
Totally disagree	2	3	0	0	1	agree

Item Four

Health education in promoting attendance at last clinic visit was better when the nurse visited or telephoned the patients at home than when health education was provided by the doctor at the clinic.

	2	2	1	1	0	Totally agree
Totally disagree	2	3	0	1	0	

Item Five

Patients with tuberculosis attending health centers with intense supervision of staff were more likely than those attending health centers with routine supervision of staff, to complete treatment.

	0	1	1	3	1	Totally agree
Totally disagree	0	1	0	4	1	

Item Six

Recruits from community to advise homeless people with positive results on tuberculin testing in promoting adherence to an initial appointment for evaluation of TB.

	0	0	2	3	1	Totally agree
Totally disagree	0	0	1	4	1	

Survey Result B

This page shows the percentage of participants who scored each box for the questions in the second round questionnaire. They were these percentages that were examined to ascertain where there was or wasn't a consensus of opinion.

Item One

Up to two reminder letters sent to patients with tuberculosis soon after they had defaulted on clinic attendance produced good results.

Totally disagree	0	83.3	0	16.6	0	Totally agree

Item Two

A monetary incentive was highly effective in promoting adherence to an initial appointment for the evaluation of tuberculosis among homeless people with positive results on tuberculin testing.

Totally disagree	33.3	50	16.6	0	0	Totally agree

Item Three

Health education given to mothers every 2 months improved compliance with therapy among children positive for tuberculin.

Totally disagree	33.3	50	0	0	16.6	Totally agree

Item Four

Health education in promoting attendance at last clinic visit was better when the nurse visited or telephoned the patients at home than when health education was provided by doctor at the clinic.

Totally disagree	33.3	50	0	16.6	0	Totally agree

Item Five

Patients with tuberculosis attending health centers with intense supervision of staff were more likely than those attending health centers with routine supervision of staff to complete treatment.

Totally disagree	0	16.6	0	66.6	16.6	Totally agree

Item Six

Recruits from community to advise homeless people with positive results on tuberculin testing in promoting adherence to an initial appointment for evaluation of TB.

Totally disagree	0	0	16.6	66.6	16.6	Totally agree

A Consensus (agreement) was reached among items five (83.2%) and six (83.2%). This means that strategy 5 (intense staff supervision) and strategy six (peer health advisers) are accepted by experts and their implementations in our general practice to promote adherence to TB treatment are feasible. Also consensus (disagreement) was reached among items one (83.3%), two (83.3%), three (83.3%), and four (83.3%). This means that strategies 1, 2, 3, and 4 are not accepted by experts and their implementations are unfeasible in general practice.

DISCUSSION

4.1 Part One: Primary Health Care Physician's Attitude towards EBM

Background

In an environment with an increasing focus on both the accountability of health expenditure and identification and measurement of health outcomes for all health interventions, it would be hazardous to ignore EBM by primary care physicians (Sackett and Rosenberg, 1995; Bannett and Glaziou, 1997; Silagy and Haines, 1998; Rosenberg and Donald, 1995; Nash, 1999).

The present study was conducted to describe the attitude towards, knowledge of, engagement in, and barriers to practicing EBM amongst PHC physicians in the center of Baghdad city.

Methodological Issues:
To achieve the aim of the present study, a cross sectional study design was carried out with advantages carefully balanced against the disadvantages. Among the well known advantages of cross sectional study are:

The study describes the distribution of items under study.

The study is useful in determining association between variables of interest and thereby gives a hint in formulating a hypothesis for the causation of such behavior.
The present study is the first study to examine attitudes towards, knowledge of, engagement in, and barriers to practicing EBM among primary health care physicians in the country as a whole.

The present study uses a self-report questionnaire form. Therefore, it is important to have confidence in the reliability and validity of the present survey data collection i.e. questionnaire. The reliability was assessed using test and re-test approach. Nearly all of the items in the survey questionnaire have moderate to high acceptance.

Reliability with overall reliability was 83.3 % among the pilot sample with no significant difference found between male and female physicians.

The response rate was 88.6% .Our subjects were physicians rather than health care teams; our narrow focus was partly due to the availability of an inadequate sampling frame.

Interpretation of Findings

Attitude towards EBM
The welcoming attitude of primary health care physicians are similar to those of British (McColl et al., 1998b) and Australian general practitioners (Mayer and Piterman,1999). The median value for estimated percentage of the respondents' clinical practice that was EB was 15%. This is lower than the figure of 50% reported by McColl et al. It is a subjective estimate, however, which has its limitations.

Awareness of Relevant Information Source
The past few years have witnessed a worldwide plethora of books, workshops and courses on how to practice and teach EBM. The Cochrane library has an increasing number of systematic reviews relevant to primary care. Evidence-Based Medicine and the American College of physicians Journal Club, as well as other online summaries of scientifically sound and clinically relevant articles are becoming increasingly available for primary health care physicians (Sackett et al., 1996).

The PHCPs in Baghdad, however, had a low level of awareness of well-known resources of EBM and, even if they were aware, did not make use of them in clinical decision-making. The classical definition of EBM put forward by Sackett et al involves integrating individual clinical expertise with the best available external research evidence (Ramsey et al., 1991). Without using current best evidence, the practice of PHCPs possibly is at risk of becoming out of date, to the detriment of patients (Sackett et al., 2000). This is very probably because it has been shown that a significant negative correlation exists between our knowledge of up-to-date care and the years that have elapsed since graduation from medical schools (Ramsey et al., 1991)

Access to Relevant Database and World Wide Web:
Only 14.1% and 10.4 % of the PHCPs had access to Medline and to the world wide web, respectively. The past couple of years, however, have witnessed a widespread governmental and private uptake and utilization of the Internet; consequently, the corresponding figures may now be higher. Although it has been shown recently that the printed Index Medicus is still the most effective literature retrieval method for GP (Verhoeven et al., 2000), there is a need to train PHCPs in electronic literature retrieval methods. The Internet fosters the practice of EBM by facilitating the generation, synthesis, dissemination and exchange of research evidence (Jaded et al., 2000). It enhances the role of EB decision-making by giving PHCPs cheap, fast and efficient access to up-to-date, valid and relevant knowledge at the right place, and in the right amount and format (Pickering, 1997).

Understanding of Technical Terms:
Our respondents showed a low level understanding of the technical terms used in evidence-based medicine. Interpretation of evidence was a key element in practicing EBM, and this low level understanding could hinder interpretation and make cascading of evidence to other
The respondents in McCool's study apparently were more familiar with technical terms commonly used in EBM, but one should keep in mind that only 7 doctors (2.3 %) in Baghdad City have attended courses on critical appraisal in contrast to (39 %) in UK (McColl et al., 1998b)

Views on Major Barriers to Practicing EBM:
The major perceived barriers to practicing EBM in primary care were patient overload and lack of personal time (72.4 %). In McCool's study, lack of personal time was also the main perceived barrier to practicing EBM (71 %).''General physicians must come to grips with 19 original articles per day, 365 days per year, if they want to keep abreast to their field'' (Davidoff et al., 1995).

In McCool's study, the attitude of the patient was perceived

as a barrier in 18% of the responses. The corresponding figure in our study was (25.6 %). Research has shown that patients' attitude should not be ignored, as they may present a major impediment to most primary prevention programmes (Fitzgerald and Pillipov, 2000).

Views on How Best to Move to EBM:

The largest proportion of PHCPs (51.8 %) thought that the best way to move from opinion based medicine to EBM was by learning the skills of EBM, while (43.2 %) thought it should be using EBM guidelines. In contrast, most of respondents in McCool's study (57%) thought that the most appropriate way was by using EBM guidelines, while (37%) thought that it should be by seeking and applying EBM summaries, and only (5%) by identifying and appraising the primary literature or systematic review (McColl et al., 1998b). This is an interesting contrast.

It has been suggested that practicing five steps of EBM is needed for the conditions that we encounter every day in order to be 'up to the minute' and very sure about what we are doing(Yamey, 2000). This probably explains why a large proportion of respondents was interested in learning the skills of EBM. It has been found, however, that operating in the 'appraising' model is time consuming and not suitable for busy overloaded practitioners (Guyatt et al., 2000), and the emphasis now, is shifting towards "information mastery" rather than traditional EBM (Shaughnessy et al., 1994).

On a much deeper level, to put evidence into action, the evidence needs to be relevant to the recipient in the sense that it should answer questions that PHCPs really want answers to and not simply cover topics that are interesting or researchable (Backer and Gilbert, 2000). Furthermore, selecting the most appropriate strategy should relate to how PHCP is most likely to react to new information about the effectiveness of clinical strategies that may affect many of their patients (Wyszewainski and Green, 2000). With more prospective trials being carried out, changing behaviors would be better understood and more effective.

Systematic Review of Randomized Controlled Trials of Strategies to Promote Adherence to Tuberculosis Treatment

Systematic reviews of randomized trials of interventions to improve adherence to prescribed drug treatment (Haynes et al., 1996) and compliance with appointment keeping (Macharia et al., 1992) have recently been published. Our review differs from these in several ways.

Firstly, it concerns a single infectious disease and aims to find out which strategies are successful in promoting adherence to the comparatively long course of treatment required. Neither of the two recent reviews includes studies of adherence to tuberculosis treatment as these fail to meet the selection criteria.

Secondly, adherence is defined broadly to cover all aspects of patient conformity to medical advice, including clinic attendance and taking drugs.

Thirdly, we included trials that measured adherence even when they did not measure the impact of the measure, such as on cure. Although, in general, Haynes et al are correct in stating that the ultimate purpose of improving adherence is to ensure clinical benefits (Haynes et al., 1996). In tuberculosis it seems reasonable to assume that patients who complete their treatment enjoy better health.

In general, the findings of the existing trials are encouraging as most strategies seem to improve adherence. We cannot find unpublished trials, and we cannot rule out the possibility of publication bias resulting in an overoptimistic view of the effects of the interventions (Dickerson et al., 1995). Simple measures such as reminder letters sent to patients who defaulted are efficacious, even among illiterate patients (Paramasivan et al., 1993). A previous review also concluded that reminder letters were consistently useful in reducing broken appointments in several settings (Macharia et al., 1992).

Another strategy that holds promise is the use of peer help. The only trial that assessed the impact of lay health workers looked exclusively at adherence to a first appointment (Pilote et al., 1996). Further research is therefore needed to determine the full potential of this intervention. The use of money as an inducement to comply with medical advice might work in the short term but is problematic (Morisky et al., 1990; Pilote et al., 1996). The global burden of tuberculosis is in poor countries where this strategy would be expensive and set precedents that could harm the work of health services in providing effective care for a range of conditions.

The independent effect of health education on adherence is difficult to determine from existing trials. In one study, patients receiving health education were contacted or seen every two months while those in the control group were not (Sanmarti et al., 1993). The relative contributions of health education and increased attention are therefore hard to separate. Furthermore, in the study by Morisky et al, health education was linked with a monetary incentive. So the independent roles of the interventions cannot be separated (Morisky et al., 1990). Lack of information in the study of intensive staff supervision (Jin et al., 1993) makes it difficult to determine the practicality of this strategy in other settings.

The measures of adherence to treatment used in most of the studies in this review were appointment keeping or

completion of treatment (drug collection up to the end of the treatment course). The extent to which these intermediate outcomes correlate with actual drug taking was unknown. While two trials found good correspondence between clinic attendance and evidence of drug metabolites in the urine (Morisky et al., 1990; Sanmarti et al., 1993),''these measures are poor surrogates for regular drug taking'' (Haynes et al., 1980). The only study measuring treatment outcome did, however, show better clinic attendance and a higher cure rate in patients in the group in which staff were intensely supervised compared with those in the control group (Jin et al., 1993).

Directly Observed Treatment

One compliance enhancing strategy that is conspicuous by its absence among the trials we reviewed, is directly observed treatment. In this scheme, the patient takes the drugs in the presence of a health care provider or other designated person. We have recently become aware of two trials of this intervention. Self-administered treatment with monthly follow up is currently being compared with treatment directly observed by a relative and by a peripheral worker in a study in Pakistan. In South Africa, a trial has recently been completed comparing self-administered treatment and treatment supervised in the community and at the specialist clinic. These and any other trials will be incorporated in subsequent editions of this review as they become available to us, provided that they meet the inclusion criteria.

Directly observed treatment has been successfully implemented in several settings and found to be associated with substantial improvements in rates of adherence and drug resistance (Sbarbaro and Sbarbaro 1994; Alwood et al., 1994; Weis et al., 1994; Wilkinson, 1994; Neher et al., 1996).

However, it has usually been introduced as part of a comprehensive effort to improve tuberculosis services. The most common accompanying interventions are improved accessibility of services, increased availability of drugs, changes in drug regimens, patient incentives, tracing of patients who default, and outreach efforts (Garner and Volmink, 1997). Directly observed treatment may, therefore, simply be a marker for a more serious commitment to tuberculosis control. Carefully designed randomized trials evaluating the independent effects of directly observed treatment are awaited.

Experts' Opinions about the Ability of Applying the Strategies that Promote Adherence to Tuberculosis Treatment in our Practice

Delphi method is a structured facilitation technique that explores consensus among groups of experts by synthesizing opinions. Group judgment is preferable to individual judgments, which are prone to personal bias (Lawrence and Olesen, 1997; Naylor, 1995). Via this technique we were able to reach a consensus among experts in National TB Control Programme about strategies that promoted adherence to TB treatment which were achieved through systematic review of primary research findings. In two of six strategies, consensus was reached with the ability of applying them in our practice; these were (i) intensive staff supervision, and (ii) peer health advisers. In the other four strategies, consensus was reached with the inability of applying them in our practice.

Stability of response has been suggested as an indicator of consensus in Delphi survey (Crisp et al., 1997). There was a surprisingly little change in the scoring from the first round to second round of the survey. When completing the second, participants were aware of how others had scored in the previous round, but this appeared to have little influence upon their opinions.

Conclusions & Recommendations

Recent attempts to improve clinical decision-making and practices through the use of best available evidence have led to the widespread use of the term EBM among health care professions including PHC. The practice of EBM constitutes five systematic steps that include searching for, critically appraising, and consequently applying the evidence to the patients as appropriate, and evaluating the impact.

Primary health care physicians need to have knowledge and skills as a tool that enables them to implement EBM. This study investigates for the first time in the country, the primary health care physicians their attitude towards, knowledge of, engagement in, and barriers to EBM. The results indicate that the majority of respondents in this study have positive attitudes towards the concept of EBM. In addition, the results indicate that the majority of respondents have little knowledge of EBM. Also the majority of respondents, in this study, consider their practice not as evidence-based, the results indicate that the majority is not engaging in activities related to EBM, that include searching and reading of literature.

This study further establishes several barriers that hinder respondents from practicing EBM. The barriers include lack of time, misconceptions about EBM, resources barriers, inability to access and appraise the evidence, patient related barriers, and organization related barriers.

This study establishes no statistically significant relationship between demographic variables (age, gender, professional qualification) and attitude towards EBM.

This study identifies certain strategies achieved through the process of systematic review of primary literatures

that promote adherence to TB treatment. These include (i) monetary incentive (ii) health education (iii) peer community advisers (iv) health education plus monetary incentive (v) intensive staff supervision.

We have found evidence for the effectiveness of several specific interventions to improve adherence to tuberculosis treatment. These should be implemented by health care providers when appropriate to local circumstances. Even simple interventions, such as reminder letters, are useful for helping to ensure that patients finish their treatment.

Many innovations for improving adherence to tuberculosis treatment exist, but only a few have been tested in randomised trials. To ensure relevance of interventions to settings in which most of the tuberculosis caseload occurs, studies in low income countries are a priority. Further research should measure adherence as well as clinical outcomes. Two of six of these strategies, are accepted by group of experts in National TB Control Programme.

RECCOMMENDATIONS

1. Addressing key policy and awareness in this arena (EBM) could substantially enhance the quality of primary health care with the integrative efforts of:
Medical Education System
Ministry of Health
Medical Syndicate
Health Research Organizations

2. A comprehensive Anti-TB Evidence Based Excellence Model that suits the current Iraqi/Arab needs should be developed. Such a framework model should emphasize the following issues:

The mission of primary health care.
The role of policy makers in problem-solving and capacity building
The coordination efforts of researchers, evidence finders and appraisers, and clinical practitioners.
The strategic problem-solving solutions for the actual practical obstacles.
3. The results of this study are expected to help post-graduate tutors, Ministry of Health and health authorities, university departments of Community Medicine and local research centers in designing local strategies for encouraging the implementation of EBM guidelines and summaries.
4. Teaching all PHCHs skills of practicing EBM by feasible and friendly methods should be also encouraged, however, these skills of appraising EBM should be introduced in training programmes of medical schools.

5. Strategies for encouraging changes among PHCHs and overcoming the barriers should be part of the decision makers' vision. Some recommended strategies:

I) Continuing medical education approaches
Educational materials:
This can achieved by distribution of published or printed recommendations for clinical care, including papers, books and video or electronic materials.
Conferences: Participation of health care providers in conferences, lectures and workshops.
II) Quality assurance approaches
Audit and feed back;
Review of performance of health care provider over a particular period of time and provision of this information to the providers.
Reminders;
Systems designed to remind clinicians or patients of information and/or desired actions. These may be manual or computerized.
III) Social influence approaches
Local consensus processes
Development of local guidelines or practice protocols through participation and round table discussion.
Use of influential individuals who may change the attitudes and behaviors of others by personal example and influences.
IV) Targeted approaches
a) Academic detailing
An educational outreach approach to providing information to practitioners, similar to activities by pharmaceutical industry sales representatives to market drugs.
b) Tailored interventions
Use of group discussion (focus group), personal interviews, observation of surveys of targeted providers to identify and address barriers to change their behavior.
6. It is probably time to establish an EBM center that will help to implant the principles, methods and practicing among the PHC teams members throughout Iraq.
7. Lastly, patient values and expectations as well as ethical issues should play a role in determining whether and which interventions should be implemented.

Table (3.10) Awareness of 296 physicians of extracting journals, review publication, and databases relevant to evidence-based medicine and their usefulness. Values are numbers (percentages) of subjects who ticked each response.

Publication	Unaware	Aware but not used	Read	Used to help in decision
Bandolier (published in Oxford)				
Evidence-Based Medicine (BMJ publishing group)	193/283 68.1%	56/283 19.8%	32/283 11.3%	2/283 0.7%
Cochrane Database of Systematic Literature Review (part of Cochrane Library)	195/289 67.5%	74/289 25.6%	17/289 5.9%	3/289 1%
Effective Health Care Bulletin (University of Leads and York).	227/271 83.7%	33/271 12.2%	9/271 3.3%	2/271 0.7%
Database of abstract of reviews of effectiveness.	245/289 84.8%	19/289 6.5%	25/289 8.7%	0/289 0%
Evidence Based Purchasing (R &D, Bristol)	280/285 98.2%	5/285 1.8%	0/285 0%	0/285 0%
	267/281 95%	14/281 5%	0/281 0%	0/281 0%

Table (3.11): Understanding of 296 physicians of technical terms used in evidence-based medicine. Values are numbers (percentage) of subjects who tick each response.

Term	It would not be helpful for me to understand	Don't understand but would like to	Some understanding	Understand & could explain to others
	7/291 (2.4%)	193/291 (66.3%)	50/291 (17.1%)	41/291 (14%)
	7/291 (2.4%)	191/291 (65.6%)	54/291 (17.1%)	39/291 (13.4%)
Relative risk	9/288 (3.1%)	204/288 (70.8%)	43/288 (14.9%)	32/288 (11.1%)
Absolute risk	27/289 (9.3%)	194/289 (67.1%)	31/289 (10.7%)	37/289 (12.8%)
Systematic review	12/291 (4.1%)	224/291 (76.9%)	35/291 (12%)	20/291 (6.8%)
Odd ratio	9/290 (3.1%)	250/291 (85.9%)	20/290 (6.9%)	12/290 (4.1%)
Meta-analysis	6/288 (2%)	246/288 (85.4%)	19/288 (6.6%)	17/288 (5.9%)
Clinical effectiveness	17/290 (5.8%)	236/290 (81.3%)	21/290 (7.2%)	16/290 5.5%)
Number needed to treat	21/289 (7.3%)	248/289 (85.8%)	15/289 (5.2%)	13/289 (4.5%)
Confidence interval	20/290 (6.9%)	240/290 (82.7%)	13/290 (4.5%)	17/290 (5.9%)
Heterogeneity				
Publication bias				
*Some respondents did not answer all questions.				

Table (3.12) Participants, design, interventions, and results of studies included in systematic review of strategies to improve adherence to treatment for tuberculosis

Strategy	Study	Participants	Design	Interventions	Outcome results	Relative Risk(95% CI)
Reminder Letters	Paramasivan et al 1993	Patient with newly diagnosed tuberculosis in Madras; they were admitted for 1 month for education, motivation, and supervised treatment. After discharge treatment was self administered on an outpatient basis for 4 months.	Random allocation with-out mention of concealment	(1) Reminder cards to patients who did not collect drugs (2)No follow of patients who defaulted on collecting drugs	Completion of treatment 88/100 group 1 73/100 group 2	1.2 (1.1-1.4)
Monetary incentive and peer advisers	Pilote et al 1996	Homeless people Predominately men, in San Francisco, who were positive for tuberculin and being followed up. All received bus tokens	Random blocks of nine people ; no mention of concealment	(1) Money $5 &3 cent (2) Peer health advisers (3) Usual care	Attending first follow up appointment G1 69/82 G2 62/83 G3 42/79	1.6 (1.3-2.0) 1.4 (1.1-1.8)

Table (3.12) cont.

Fig.(3-2):Extremes of awareness of evidence - based resources in 296 PHCPs

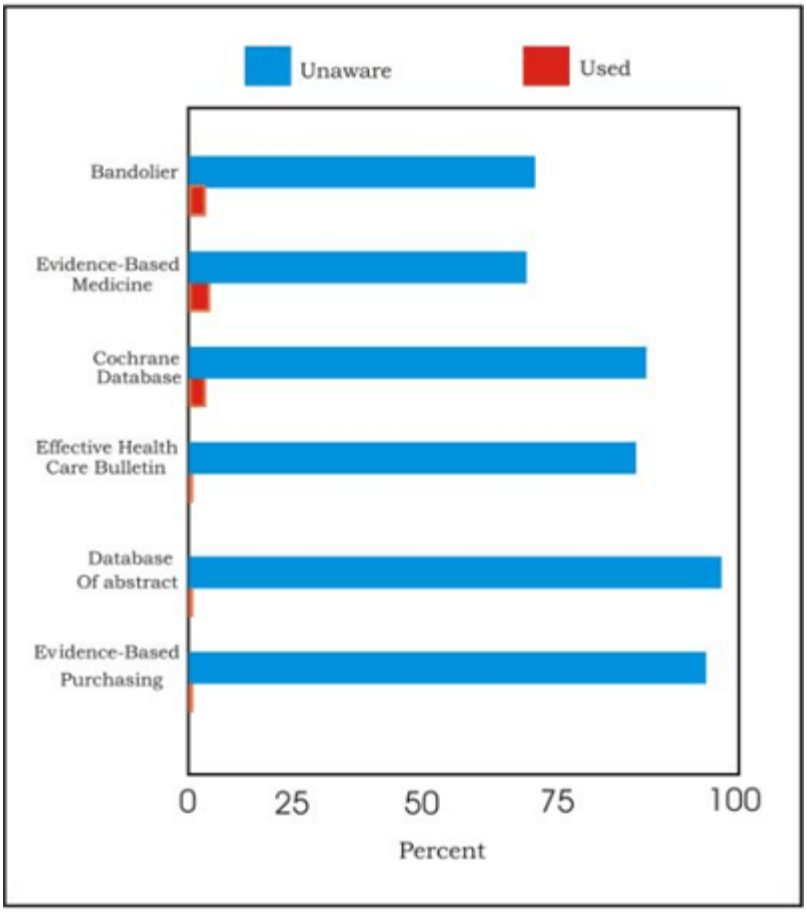
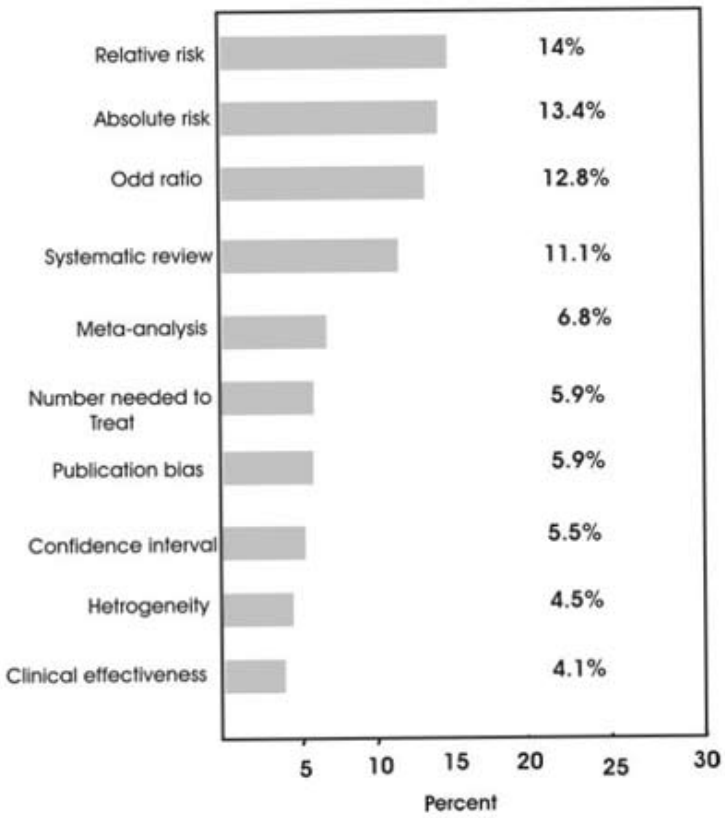


Fig.(3-3) Percentage of 296 PHCPs able to understand and explain technical terms to others



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Evaluation of Childhood Deaths in Istanbul, Turkey

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SUMMARY

The aim of this study is to determine the features of and changes in the medico-legal childhood deaths that occurred in Istanbul, Turkey; and to contribute to the establishment of a database on childhood deaths. In this study, the childhood deaths were evaluated with respect to age, sex, causes of deaths and the origins. The records of the autopsies performed in the Council of Forensic Medicine in Turkey between the years 1997-2001 were reviewed. 1,568 of 14,467 deaths were found to be in the childhood age range of 0-18. 1047 (66.8%) of those children were male of gender and 521 (33.2%) were female. The commonly encountered origins of childhood deaths were sudden-unexpected causes in early childhood, accidents in the playing age, homicide and suicide in the adolescents. Among all the deaths, 571 cases (36.4%) were seen in the age group of 0-6 years. Accidents account for 619 cases (39.3%), blunt traumas (156 cases) present the most common cause of deaths. In order to prevent childhood deaths, preventive and curative health services should be strengthened, providing training programs for parents, and should be a concern of the government bodies and civil society. Meanwhile, starting with the efforts of support and training; all measures must be taken in order to activate the United Nations Child Rights Contract.

INTRODUCTION

The arrangement of studies on the causes of childhood deaths and recording the findings are very important. Establishing a system that serves to explore all childhood deaths will provide the means of observing these cases. In addition, due to religious beliefs and social reasons cases of suicide are not recorded. With the experiences of countries, that have developed systemic mechanisms have shown that death could be possible in the majority of cases of violence and negligence (1-3).

The Declaration of Children's Rights focuses not only on the basic right to life but also on the contribution of health and training efforts, concerned with the development of the child. At this point establishment of specific mechanisms that will let us explore, record and report all childhood deaths is a requirement. The causes of these deaths are extremely important (4).

The most important characteristic of child injury deaths is the fact that many, if not most, can be prevented (5,6). Saunders et al. (7) have found that 2.7% of natural deaths and 96% of injury deaths are preventable. The aim of this study is to evaluate the various features of the medico-legal childhood deaths in Istanbul, Turkey; and to contribute to the establishment of a database on childhood deaths.

MATERIALS AND METHODS

The records of medico-legal autopsies of the 0-18 age group performed in the Council of Forensic Medicine, Ministry of Justice, Istanbul for the years 1997-2001, were separated into four age groups (0-6, 7-11, 12-15, 16-18). The separation was carried out according to existing age groups specified in child development and legal practice. Our study field, Istanbul, is the largest city of Turkey with a population of 10,018,735. The cases are grouped as homicides, suicides, accidents, sudden-unexpected deaths (natural deaths and undetermined deaths). Age, sex and causes of deaths of each group were studied.

RESULTS

In this study, childhood deaths according to the causes and origins were evaluated. The records of the autopsies performed in the Council of Forensic Medicine in

Istanbul, Turkey between the years 1997-2001 were reviewed. 14,467 medico-legal deaths were investigated in Istanbulover a period of five years. 1,568 (10.8%) of all deaths comprised by our study population were children (0-18 age).

1,047 (66.8%) of those children were male and 521 (33.2%) were female (Figure 1). The distribution of the years is presented. In a period of five years, 1,568 autopsies were performed on children (Figure 2).

Evaluation of all childhood deaths (n=1,568) revealed that 116 cases (7.4%) were caused by suicides (Figures 3, 4), 609 cases (38.8%) were accidents (Figure 5), 204 cases (13%) were homicides (Figure 6), 188 cases (12%) were natural deaths and 451 cases (28.8%) were unidentified deaths (Table 1). Of 116 suicides, 78 cases (73.6%) were due to hanging, and 13 cases (12.3%) firearms, 11 cases (10.4%) fall, 3 cases (2.8%) intoxication, and 1 case (0.9%) CO poisoning (Figure 4).

Blunt traumas account for 25% (156 cases) of the 619 cases that were determined as accidents. 22% (137 cases) of accidents were drowning cases (Figure 5). Of 204 homicides in childhood deaths, 80 cases (39.2%) were associated with stabbing, 76 cases (37.3%) with firearms and 31 cases (15.2%) with strangulation (Figure 6).

Respiratory - cardiovascular diseases (n=119; 63.3 %) are the leading cause of deaths in natural deaths. Infectious diseases with 22.9% (n=43) are the second most common cause of natural deaths (Figure 7).

DISCUSSION

The term "child" is accepted as the period of 0-18 years of age according to the Declaration of Children Rights. Childhood deaths present various features with respect to age, sex, developmental stage, social and cultural context, geographical location and life styles of the family (1,8). Investigation of childhood autopsies according to the groups is important especially for determining the causes and prevention of childhood injuries and deaths. Accidents and natural deaths are the common causes of the deaths in children like in adults (8,9).

In this study, childhood deaths according to the causes and the origins of deaths were evaluated. The records of the autopsies performed in the National Institute of Forensic Medicine in Turkey between the years 1997-2001 were reviewed and 1,568 of 14,467 deaths were found to be in the childhood age range of 0-18. These cases of 0-18 age group, 1,047 (66.8%) were male and 521 (33.2%) were female.

Deaths caused by accidents, as those in the literature, are the most widespread death origin. The basic cause of this condition is that the persons or institutions taking full responsibility for the 0-6 age group, particularly, don't show enough interest (10). In our study, the ratio of deaths caused by accidents is 70%.

Blunt injuries are the leading causes of deaths in children under 18 years of age (11). In this study; 156 (25%) blunt traumas and 154 (25%) CO poisoning cases were mostly seen due to accident. Drowning (n=137, 22%) was accidentally the second cause of death. Drowning cases usually occurred at sea.

Although suicides are rarely seen in the younger age group and early adolescence, they present a growing risk in older age groups. Preventing suicides in adolescence has become the main concern (12). The autopsy records of the Bonn Institute of Forensic Medicine and the database of the Bonn police authorities from 1989 to 1998 were retrospectively analyzed for this phenomenon. This search revealed 37 respective suicides involving 23 male (62%) and 14 female (38%) victims. The ages ranged from 10 to 21 years with the prevalence sharply increasing in adolescents and young adults (1). For suicides, methods like hanging, intoxication and firearms are mostly used (11). In our study, 71 cases of our 106 suicide cases were in the 16-18 age groups. Hanging (73.6%) was the most common method of suicide among all the deaths. In suicide cases, firearms (12.3%) were the second biggest cause and fall (10.4%) the third cause of deaths.

Homicides were inflicted with stabbing and firearms like other cities of the world (3). Infantile and adolescent patterns of homicides are recognized: Child abuse by parents characterizes the former; gunshots and other assaults by peers characterize the latter (13). During 201 homicides over the five-year period of a study, most of these deaths occurred in adolescents, but there were 36 deaths in children under 13 years old. In young children, the assailant was usually a parent or other family member, including eight children who were murdered by their father and six by their mother. Only three children were murdered by a stranger. Prevention strategies include decreasing children's access to guns and improving parental supervision (14). In our study, of 204 homicides in childhood, 80 (39.2%) cases were associated with stabbing, 76 (37.3%) firearms, 31 (15.2%) strangulation, 15 (7.4%) blunt traumas, and 2 (1%) burns. 117 (57.3%) of 204 homicide cases were in the 16-18 age group.

The commonly encountered origins of childhood deaths were natural causes in early childhood, accidents in the playing age, and homicide and suicide in the adolescents (3). Infections are the most common cause of natural

deaths in children in Cyprus. It is common especially in infants and this can be explained with the developing immune system in this period. This emphasizes the importance of preventive medicine (8). Deaths due to infectious diseases took the first place and undetermined deaths came among the whole death causes in the 0-6 age group (11). In our study, respiratory - cardiovascular diseases (n=119; 63.3%) and infections (n=43; 22.9%) are the common causes of natural deaths in children.

CONCLUSION

Investigation of childhood autopsies according to the origins, is important especially for determining the causes and prevention of childhood injuries and deaths. Accidents are the most common origin of the deaths in children. Childhood deaths, especially intentional-preventable injury cases, enhance the liability of those who are responsible for the care and supervision of children. So, training programs should be provided for parents, to prevent childhood injuries.

In order to prevent childhood deaths, preventive and curative health services should be strengthened, and education within the individual and social level should be a concern of the government bodies and civil society. Meanwhile, starting with the efforts of support and education; all measures must be taken in order to activate the United Nations Child Rights Contract in Turkey.

Figure 1. Distribution of death origins according to age groups

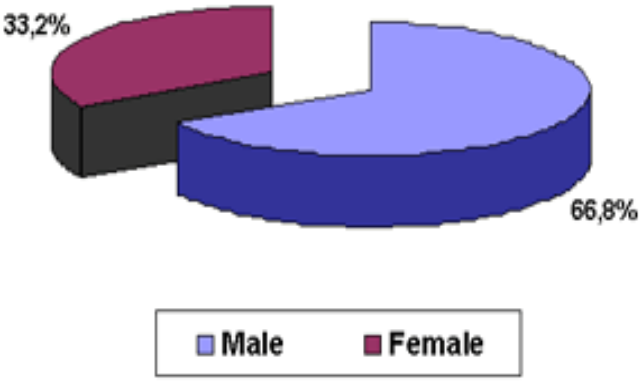

Figure 2. The distribution of deaths through the years

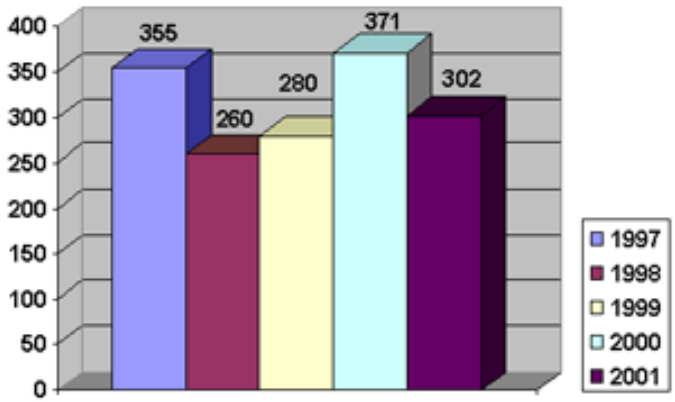

Figure 3. The distribution according to the origins of the cases

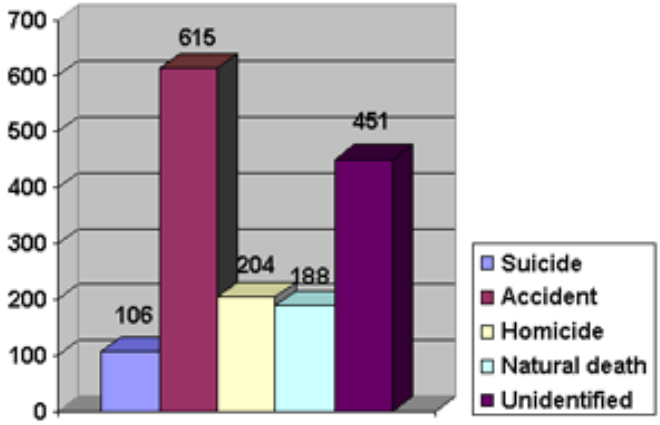

Figure 4. The distribution of deaths according to suicides (n=106)

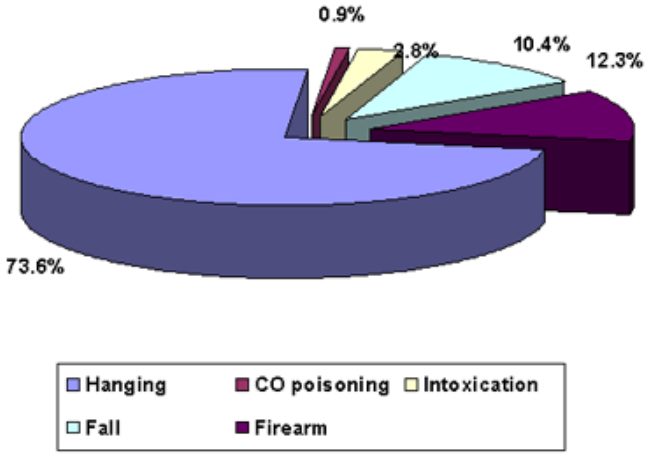

Figure 5. The distribution of deaths according to accidents (n=619)

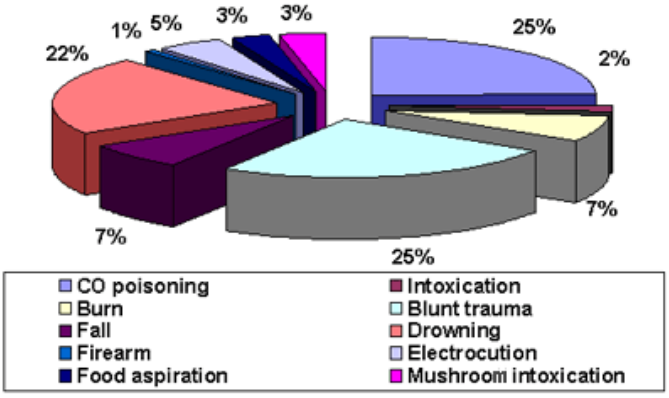

Figure 6. The distribution of deaths according to homicides (n=204)

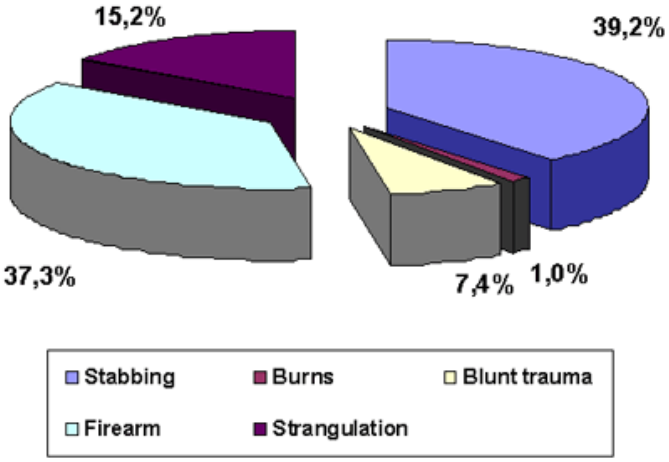

Figure 7. The distribution of deaths according to natural deaths (n=188)

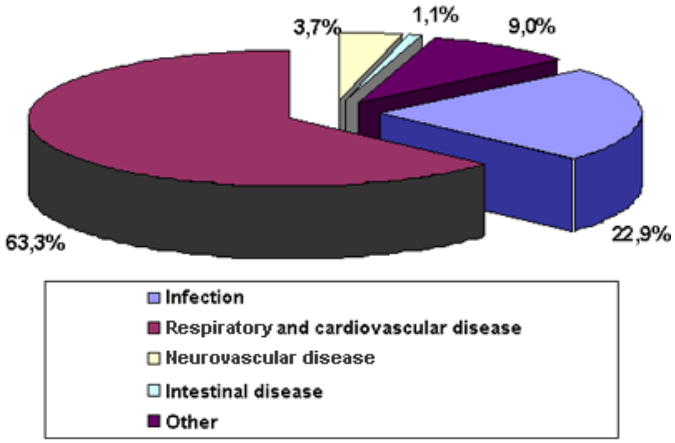

Table 1. Distribution of death origins according to age groups

	Suicide		Accident		Homicide		Sudden-Unexpected Deaths				Total	
							Natural		Undetermined			
	n	%	n	%	n	%	n	%	n	%	n	%
0-6	0	0	204	13	29	1.8	107	6.8	231	14.7	571	36.4
7-11	0	0	89	5.6	18	1.1	16	1	39	2.5	160	10.2
12-15	37	2.4	145	9.2	40	2.6	27	1.7	72	4.6	321	20.5
16-18	71	4.5	181	11.5	117	7.5	38	2.4	109	7	516	32.9
Total	106	6.9	619	39.3	204	13	188	12	451	28.8	1,568	100

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Retrospective analysis of Pediatric ocular trauma at Prince Ali Hospital

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ABSTRACT

Aims and Objectives: To analyze the causes and the outcome of pediatric ocular trauma at Prince Ali Hospital in Al-karak city, in the south of Jordan, between January 2001 and January 2004.

Materials and Methods: Reviewing the medical files of all children below the age of 14 years, who were presented to the eye clinic or referred from pediatric emergency clinic with ocular injuries. Overall p value for predictors of visual and ocular outcome, was determined.

Results: One hundred and twelve children represents 11% of all pediatric attendances presenting with ocular trauma. The male to female ratio was 2:1. Eight (7.2%) patients had open globe injury, one hundred and four (92.8%) had closed globe injury. Eighty-two (73.2%) patients were treated as out-patients and followed up in the clinic by regular visits; thirty (26.8%) patients needed hospital admission. Eighty-eight (78.6%) occurred while at play and 24 (21.4%) occurred at home. Ninety-eight (87.5%) of the patients had normal or near normal visual acuity at time of discharge from the clinic, thirteen (11.6%) suffered moderate to severe decrease in their visual acuity, one case only (0.9%) lost his vision in the affected eye .No child had a bilateral injury.

Conclusions: Ocular trauma in children is a common cause of hospital attendance. This study has shown the majority or presentations often result in good visual outcome. Poor final visual acuity was related to poor presenting visual acuity, injury to multiple ocular structures and penetrating injuries. It is necessary to ensure safe places for children to play under adult supervision to avoid ocular trauma and to encourage early attendance to the hospital in case of ocular trauma. Early management at the hospital should be prompt, and special care in management of post-operative problems is needed to improve the visual outcome.

INTRODUCTION

Ocular trauma in children is a common cause of ocular morbidity despite introduction of new methods of treatment and improvement of management, and is a leading cause of non-congenital unilateral blindness in this age group [1,2] . Children are at risk of ocular trauma because of their inability to avoid hazards [3]. Most of these hazards are found while children play, or are at home. Identifying the causes of ocular injuries may help in determining the effective methods in reducing the incidence of serious ocular traumas.

This retrospective study reviews the medical records of children who presented with ocular trauma at Prince Ali Military Hospital in the south of Jordan over a period of three years; analyzing the causes of ocular injuries, discussing different treatment modalities, determining the visual outcome, and the possible methods to reduce their incidence.

MATERIALS AND METHODS

A review of medical files of two hundred and fifteen patients of whom one hundred and twelve (52%) were below the age of 14 years, with a history of ocular trauma presenting to the eye clinic or referred from the paediatric clinic at Prince Ali Hospital, over a period of three years from January 2001 to January 2004. Seventy-five were male and thirty-seven female.

Ocular trauma was classified as either closed globe like contusion, superficial foreign body, small corneal laceration, or open globe injuries like penetrating, perforating, rupture or intra ocular foreign body.

Initial management included the following:
a. Determinig if there were life threatening problems.
b. Taking a full history about the cause and mechanism of injury, and
c. Examination of both eyes

Visual acuity was tested using Snellen's chart or illiterate E chart, and for young children by naming pictures or matching letters.

Superficial foreign body was removed by using topical anesthesia; corneal abrasion was treated by ointment and patching of the eye; small corneal laceration with formed anterior chamber was treated by eye patching or using a soft bandage contact lens. Injury needing surgical repair was done under general anesthesia using the operating microscope, corneal wounds were sutured by 10/0 nylon while scleral wounds sutured by 6/0 ethibond or 6/0 vicryl. Visco-elastic material was used depending on the need. In cases with multiple ocular structure traumas, primary suturing was done while further management was done by a vitreo-retinal surgeon at King Hussein Medical Center (KHMC). Hyphaema was treated by conservative measures like complete bed rest, sedatives, eye patching, anti-glaucoma if needed, but if conservative treatment was unsatisfactory, anterior chamber paracentesis was done under general anesthesia.

Post-operative treatment included topical antibiotics, steroid, and mydriatics. Follow up was carried out for a period of 2 months in 70% of cases and only for 4 weeks in the remainder. Those patients referred to KHMC, came back for follow up and to continue their treatment.

Near normal visual acuity was taken as 6/12 or better. Blindness was regarded as that defined by World Health Organization, with visual acuity less than 3/60.

RESULTS

A total of 215 patients who presented with ocular injury during the study period, of whom 112 (52%) were children with ocular trauma, 75(67%) of the children were male and 37(33%) were female with a ratio 2:1. 6 patients (5.5%) were aged 4 years or less and 106 (94.5%) were between 5-14 years of age. Age and sex distribution is shown in Table 1.

All patients were injured in one eye. 67(59.8%) had right and 45(40.2%) left eye injury. The commonest type of injury was contusion due to blunt trauma in 62 (55.4%), and 12 (10.6%) had superficial foreign body. 18(16.1%) had small corneal laceration. 8 (7.1%) had eye lid injury, 4 (3.5%) had chemical injury, 7 (6.3%) had rupture globe, and 1 (0. 9%) had penetrating eye injury. Table 2 shows the types of ocular trauma.

82 (73.2%) of the cases were treated as outpatients. 30 (26.8%) were admitted to the hospital, of these 21 (18.8% of the total) stayed in the hospital less than 5 days while 9 (8% of the total) stayed longer than 6 days. 16 (53%) of the cases who were admitted had hyphaema.

The causes of injury were many and variable but air gun toys were the most common especially between the ages of 5-14 years.

Other causes were during sporting activities, or due to falling down, sticks, domestic chemicals, glass and tree leaves. The injury causes are shown in Table 3.

The final visual acuity was taken at time of final discharge from the clinic. The child who lost his vision in the affected eye had been exposed to a penetrating injury.
The visual acuity at presentation and the final visual acuity are shown in Table 4.

Good final visual acuity was related to good initial visual acuity, to non penetrating injuries and early presentation, while poor final vision was related to poor initial visual acuity, multiple eye structure injury and penetrating injury.

DISCUSSION

There is an excess risk of severe trauma among the very young which has been recognized in many studies, with more than one third of all injuries occurring in the pediatric age group [4,5] which is the same finding as in our study.

Other studies have identified that boys tend to be affected more commonly than girls [6,7,8] which is in keeping with our findings. School aged children are more susceptible than younger age groups, because they are more independent and adventurous, which may make them more vulnerable [7].

In this study blunt injuries predominate. Most children were admitted because of hyphaema. This represents further incidence that there is a trend of increased incidence of blunt trauma in children7 compared with perforating injuries which were more common in the past. [4]

In our study we have found that toys are a common cause of ocular injury in children, and air gun toy injuries have a poor prognosis because of the damage caused by the high velocity pellets and often result in loss of vision or even enucleation 9, so safety standards should be considered for the manufacturers of such toys.
Sports have frequently been reported as a source of major ocular trauma in all age groups, but especially in the young [10,11].

Penetrating eye injury contributes to poor visual outcome and ocular survival [5,8]. Poor visual outcome is also

related to multiple ocular structure injury and severity of initial injury [12, 13], and still ocular trauma in children is a major cause of monocular blindness and a common cause of enucleation in children [14].

In this study most of the ocular injuries were contusions due to blunt trauma with good initial visual acuity, and the early presentation to the eye clinic because of parental awareness, reflects the good final visual outcome.

In conclusion, pediatric ocular trauma is a major cause of ocular morbidity in children and requires special care. There is a strong need for adult supervision of children at play or at home, and also there is a need to encourage early attendance to the hospital.

Young children are uncooperative in examinations like assessing the visual acuity, and examination of the post segment which may have to be done under general anesthesia. Post-operative managemen't like correction of unilateral aphakia, and proper management of amplyopia require cooperative parents. Prevention of ocular trauma in children should remain a priority to reduce ocular morbidity.

Table 1: Age and Sex distribution:

Age in years	Male frequency	Female frequency	Total frequency
< 1	0(0%)	1(0.9%)	1(0.9%)
1-4	3(2.7%)	2(1.8%)	5(4.5%)
5-10	48(42.9)	26(23.2%)	74(66.1%)
11-14	24(21.4%)	8(7.1%)	32(28.5%)

Table 2 shows the percentage of different types of ocular injury:

Type	No of cases	%
Contusion	43	38.4%
Superficial F.B	39	34.8%
Eye lid injury	18	16.1%
Chemical injury	4	3.5%
Rupture	7	6.3%
Penetrating	1	0.9%

Table 3: Causes of injury in different pediatric age groups.

	< 1 year	1-4 years	5-10 years	11-14 years
Air gun toy	0(0%)	0(0%)	35(31.3%)	12(10.6%)
Sport	0(0%)	0(0%)	22(19.5%)	6(5.3%)
Falling	1(0.9%)	1(0.9%)	5(4.5%)	4(3.6%)
Toys	0(0%)	4(3.6%)	2(1.8%)	0(0%)
Domestic chemicals	0(0%)	0(0%)	1(0.9%)	3(2.7%)
Sticks	0(0%)	0(0%)	4(3.6%)	2(1.8%)
Tree leaves	0(0%)	0(0%)	3(2.7%)	3(2.7%)
Others	0(0%)	0(0%)	2(1.8%)	2(1.8%)

Table 4: Visual acuity at presentation and final visual acuity:

Visual acuity	At presentation	final visual acuity
6/6---- 6/18	72(64.3%)	95(84.8%)
6/24-6/60	26(23.2%)	9 (8%)
<6/60- 3/60	8(7.1%)	2 (1.8%)
<3/60-PL	6(5.4%)	6 (5.4%)

DISCUSSION

There is an excess risk of severe trauma among the very young which has been recognized in many studies, with more than one third of all injuries occurring in the pediatric age group[4,5] which is the same finding as in our study.

Other studies have identified that boys tend to be affected more commonly than girls6,7,8 which is in keeping with our findings. School aged children are more susceptible than younger age groups, because they are more independent and adventurous, which may make them more vulnerable[7].

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Adult Gynecomastia - Case Report and Brief Review

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ABSTRACT

Gynecomastia is a strictly male condition and is the most common cause of male breast enlargement. Gynecomastia is predominantly benign; however, remote possibilities of underlying malignancy warrants further investigation, especially in the middle aged and elderly population. True prevalence amongst the Saudi population is not known, and in reporting this case in a middle-aged Saudi man we tried to observe any differences in clinical manifestation from those reported in literature, and highlight the needed diagnostic work-up and treatment in clinically indicated cases.
Keywords: Gynecomastia, Saudi population, clinical manifestation, diagnostic work-up and therapeutic modalities.

INTRODUCTION

Gynecomastia results from proliferation of the glandular breast compartment triggered by several endogenous, and occasionally by exogenous, factors [1]. Often, gynecomastia is the result of absolute imbalance between estrogen and androgen action at the breast tissue level. Estrogens stimulate and androgens inhibit breast glandular development [1, 2]. Most of the cases are benign whether in infancy, pre-pubertal, pubertal and even in adults. However, occasionally gynecomastia might be due to the underlying pathologic process of male breast cancer especially in the elderly population with prolonged exposure to female hormones, positive family history, or patients with reduced testicular function (Kleinfelter's Syndrome) [1, 2]. Age, family history, drug/medication history, clinical manifestation and specific diagnostic modalities remain crucial in differentiation and treatment. Presenting a case of gynecomastia among middle-aged Saudi men and reviewing related literature, we aim towards increasing the awareness of such a clinical entity and highlight the work-up and treatment when needed.

CASE REPORT

A 51 year old Saudi male presented to our out-patient clinic with mild pain and swelling of his right breast of 6 weeks' duration. He voluntarily expressed his reluctance to seek medical advice for the past few weeks saying, "I thought it would go away." Patient is a smoker (30 packets a year). Family history, past medical, surgical and drug history was unrevealing. Examination revealed a 2.5 cm x 1.5 cm firm, mildly tender sub-areolar mass with regular borders and free from underlying and overlying tissues, normal nipple and no lymph nodes were felt. TSH, liver function test, renal and chest X-ray were all normal. Mammography report noted: "2.9 cm x 1.3 cm retro-areolar right breast mass likely related to cancer." A fine needle aspiration by a general surgeon followed and the pathology report revealed "Few clusters of ductal cells with a few single epithelial cells." Afterwards, an open right breast excision was done and the pathology report noted the following: "Several ductular structures lined by hyperplastic ductal epithelium with papillary projections and micro-papillary formations embedded within connective tissue stroma featuring an area of basophilic myxoid stroma around ducts and intervening collagenous fibrillary stroma. No features of malignancy detected. The appearance is typical of gynecomastia." Fig 1,2

DISCUSSION

Gynecomastia is predominantly unilateral and quite prevalent among infants, pubertal and to a lesser extent amongst the elderly population. Female hormone estrogen is the main factor in breast glandular proliferation needed for breast enlargement in both sexes [1]. In males, estrogen is naturally counter-balanced by male hormones androgens. Changing the balance between the two sex hormones due to several causes (Table 1), enhanced sensitivity of breast tissue to estrogen and insensitivity to androgens lead to breast enlargement as well [1, 2]. Not all breast enlargements are due to hormonal imbalance. Many overweight and obese teens and adults have enlarged bilateral breasts due to increased fat and not breast tissue. This is called pseudo-gynecomastia and usually disappears only when individuals involved lose weight.

Neonatal and pubertal cases of gynecomastia remain the most common and usually resolve spontaneously in a couple of weeks to two years, respectively. Reassurance, patient and relative education of the physiologic basis of the condition and periodic follow-up is all that is needed. However, gynecomastia in pre-pubertal [3] and elderly age

groups [4, 5, 6] warrants further investigations as clinically indicated. Long-term direct or even indirect exposure to estrogen has been associated with some gynecomastia cases in pre-pubertal children. Testicular cancers, primary gonadal failure (Kleinfelter's Syndrome), secondary hypogonadism (mumps orchitis, orcheoctomy cases) can lead to gynecomastia due to decreased androgens. However, liver cirrhosis, lung cancer, hyperthyroidism and patients on dialysis have been associated with increased levels of free estrogen as a plausible cause of gynecomastia seen in some of these patients. Finally, drug and medication history should be reviewed as another cause of gynecomastia in adults [1, 7] (Table 1).

Male breast cancer, though very rare, does exist. It accounts for 0.2% of all cancers and 1% of all breast cancers [4, 5, 6]. Our patient had a negative family history and/or risk factors for male breast cancer. Physical exam was also reassuring; the mass felt concentric to the nipple without nipple changes, well delineated borders and not fixed to underlying tissues and overlying skin. Initial work-up was negative, and the mammography report was nonconclusive towards either diagnoses. Fine needle aspiration remains important in the diagnostic armamentarium of breast lumps, yet literature points to some false negative results [4]. Final diagnosis came through the pathology report of the excised breast tissue that ruled out malignancy and detailed the typical appearance of gynecomastia. The etiology behind our patient's gynecomastia might be explained on the basis of either increased estrogen sensitivity or decreased sensitivity of breast tissue to endogenous androgen.

Finally, open excision of breast tissue has been widely used for gynecomastia. Recently, new techniques in the surgical approach utilizing the hyper-tumescent power liposculpting have found to be successful in treating gynecomastia and leaves little scarring. Post-operative control of body weight and exercise is needed for long-term positive results and patient's self esteem [8].

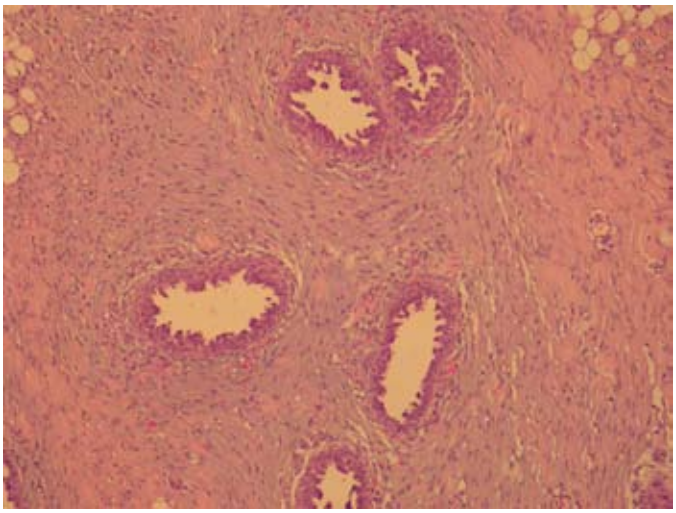

Fig: 1 Low power featuring the hyperplastic irregular dilated ducts surrounded by fibrous stroma (Hematoxyline and Eosin stain X100).

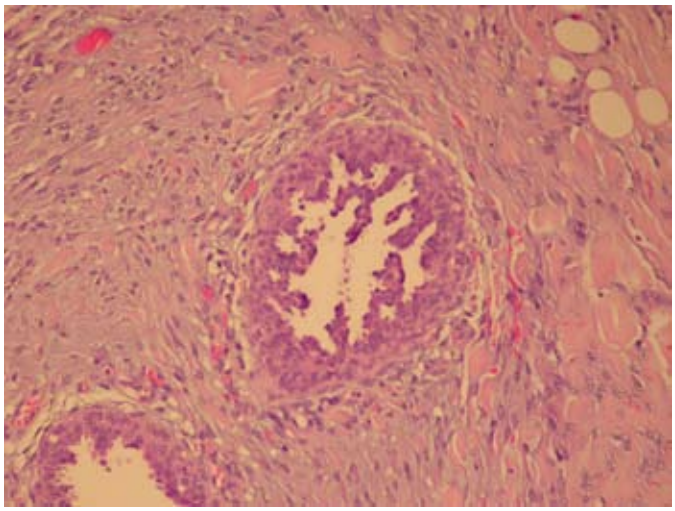

Fig: 2 High power showing Hyperplastic ducts with intraluminal micropapillary formation

Table 1. Conditions and Drugs Associated with Gynecomastia

1. Physiologic: Neonatal, pubertal

2. Pathologic conditions:

- Testicular cancers
- Primary gonadal failure (47xxy Kleinfelter's syndrome)
- Secondary hypogonadism; Mumps orchitis, Orcheactomy
- Liver cirrhosis
- Lung cancer
- Renal failure - Dialysis
- Hyperthyroidism

3. Drugs and medications:

- Estrogen and Estrogen agonists
- Anti-androgens
- Phenytoin, Aldomet, Cimitidine and Valium, Aldactone, Digitalis, Calcium channel blockers, Anabolic steroids,
- Marijuana and heroin

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