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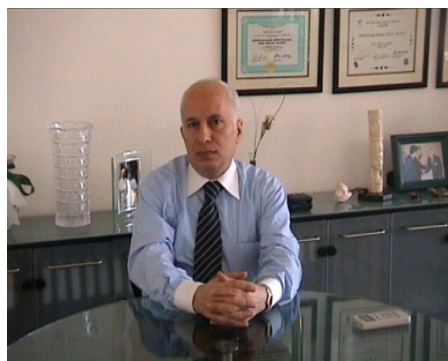
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## From the Editor



**A. Abyad**

(Chief Editor)

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This is the second issue this year, and we are extremely pleased with the quality of papers that we are receiving and we look forward to continuing with you as an avenue for education and research in the region and the World . In this issue we have a number of papers from the region.

A paper with combined authorship between Australia and Iran looked at Social accountability - a challenge for global medical schools. The authors pinpoint that medical schools should meet three criteria, i.e. educating medical students in sufficient numbers to quality international standards to meet national requirements for health professionals, conducting research and being a community advocate for national and regional health and medical problems and ensuring curriculum meets these, and thirdly, providing, via suitably educated graduates, health and medical care to all members of society based on ethical guidelines.

Continuing with the ethical focus a paper from the American University of Beirut raised the issue whether medical ethics researchers should care what the public thinks? The author stressed that the relationship between bioethics and public policy is becoming an important topic particularly with the new and rapid development in biotechnology. The question arises as to whether medical ethics researchers and/or bioethicists should care what "members of the public" think? The author attempted to show that although there are reasons to believe that public opinion should be taken into account by policy makers, it is important to realize that not all that the public says can, or should, be taken as a norm.

A cross sectional study from Saudi Arabia looked at estimating the prevalence of passive smoking among adult males at a hospital based primary care clinic

The study was carried at a primary care clinic at King Khalid University hospital, Riyadh, Saudi Arabia. All adult male patients who visited the clinic were interviewed and asked about their exposure to passive smoking during the last one month and where were the common places of exposure. The study highlighted the preliminary estimate of the prevalence of passive smoking among adult male patients attending a primary care clinic, at a university teaching hospital, to be 83.2%. The authors concluded that the Prevalence of passive smoking in Saudi Arabia need to be further studied in a community based survey, as the preliminary estimate in this study showed high prevalence, especially in public places.

Another paper from Saudi Arabia reviewed acute treatment for Brucellosis. The authors stressed that Brucellosis is a zoonotic infection endemic in the Mediterranean Basin, the Middle East, Central Asia, including Arabian Gulf and parts of Africa and Latin America; it remains a major cause of morbidity in humans. Humans are usually infected through ingestion of raw milk, home-made cheese, or in rural areas through direct contact with infected animals. The authors discussed the available treatment options and compared the evidence based health care resources.

A paper from Bahrain looked at the prevalence of refractive errors in the Bahrain population. A total of 17,936 eye patients between 10-35 years of age living in Bahrain were included in this study. Out of 17,936 patients 54.6 % were myopic; 4.9 % hyperopic; 39.9% astigmatic and 0.6% antimetropic. The authors concluded that the prevalence of refractive errors varies across different age groups. Myopia has the highest prevalence followed by astigmatism, while antimetropia is quite rare. Furthermore, patients in the age group of 15-19 showed high susceptibility to develop myopia and astigmatism.

A further paper from Riyadh looked at the use of CLINICAL SIGNIFICANCE OF CADAVERIC DISSECTION FOR FUTURE CLINICIANS. This study highlights the fact that dissection can impart anatomical knowledge as well as offer other relevant, positive learning opportunities to enhance the skills and attitudes of future clinicians. The authors concluded that medical students and interns expressed that the cadaveric dissection remains the most powerful means of presenting and learning anatomy as a dynamic basis for solving problems during their clinical teaching.

A community-based study was carried out on blood groups representing a random population sample from Al-Hajouf Ethnic group, Saudi Arabia, to determine the frequency of different blood groups in AL-hajouj Ethnic Group, which would not only help in blood transfusion services but also eliminate the risk of erythroblastosis fetalis in the neonates. The authors conclude that the frequency of ABO blood groups in both Rh positive and negative subjects among the AL-hajouj Ethnic Group was B>A>O>AB where the blood group B was the commonest among Rh positive subjects.

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# Estimation of the prevalence of passive smoking among adult males at a hospital based primary care clinic

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## Introduction

Passive smoking is one of the important health issues which need to be considered in health planning. Passive smoking is linked with cancer, heart disease, respiratory illness, and is the leading source of indoor air pollution. In the United States, passive smoking has been linked to the deaths of at least 53,000 non-smokers each year, about one non-smoker for each eight smokers that tobacco kills (1). Exposure at work might contribute up to one fifth of all deaths from passive smoking in the general population aged 20-64 years, and up to half of such deaths among employees of the hospitality industry. Adoption of smoke free policies in all workplaces and reductions in the general prevalence of active smoking would lead to substantial reductions in these avoidable deaths(2). Environmental tobacco smoke is by far the most significant indoor air quality issue in health terms and it is a well-known health threat and has been classified as carcinogenic to humans(3). Many developed countries have moved to the phase in which smoking has dropped and disease rates are declining. By contrast, rates of smoking are still rising in many developing countries, and a goal of tobacco control for these countries is to avoid the predicted rise in tobacco-related disease over the course of this century(4). More than 1 billion people, or one-sixth of the world's population, continue to smoke, and half the world's children are involuntarily exposed to smoke(5). However, exposure to Passive Smoking at home could not be effectively addressed only by legislation. Educational interventions targeting parents, especially those who are smokers, could substantially reduce the exposure of adolescents to second hand smoke at home(6). The aim of this study is to Estimate the prevalence of passive smoking among adult males at a hospital based primary care clinic, in Riyadh, Saudi Arabia.

## Abstract

The aim of this study is to Estimate the prevalence of passive smoking among adult males at a hospital based primary care clinic, Riyadh, Saudi Arabia.

**Methods:** A cross sectional Study conducted at a primary care clinic at King Khalid University hospital, Riyadh, Saudi Arabia during the period from January to June 2010. All adult male patients who visited the clinic were interviewed and asked about their exposure to passive smoking during the last (one) month and where were the common places of exposure. Also their opinion about their behavior toward smokers was discussed. Data has been entered and analyzed using Statistical package of social science SPSS version 15.5.

**Results:** The current study highlighted the preliminary estimate of the prevalence of passive smoking among adult male patients attending a primary care clinic, at a university teaching hospital, to be 83.2%. Also it showed that public places were the most common places where most non smokers were exposed to the hazards of passive smoking. Most passive smokers were unhappy and have been

disturbed by smoking hazards, and most of them think that active smokers are careless about their environment, while 79.9% of passive smokers had difficulty leaving the place where smoking occurred because it is shared and they have their own task to finish during that time.

**Conclusion and recommendation:** The Prevalence of passive smoking in Saudi Arabia needs to be further studied in a community based survey, as the preliminary estimate in this study showed high prevalence of passive smoking especially in public places. It is highly important to educate all families and communities about the importance of avoiding smoking in front of others, and to emphasize the importance of strict implementation and follow up of anti smoking regulations especially in public places.

## Method

This was a cross sectional Study conducted at a primary care clinic at King Khalid University Hospital, Riyadh, Saudi Arabia during the period from January to June 2010.

All adult male patients who visited the clinic were interviewed and asked about their exposure to passive smoking during the last one month and where the commonest places of exposure. Also their opinion

about their behavior to smokers was discussed. Data was entered and analyzed using Statistical package of social science SPSS version 15.5.

## Results

Age distribution	Frequency	Percentage %
12-19	16	4.7
20-29	38	11.2
30-44	79	23.3
45-59	94	27.7
60 and above	112	33
Total	339	100

Table 1: Age distribution of 339 adult patients attending a primary care clinic, King Khalid University Hospital, Riyadh, Saudi Arabia

Passive Smoking	Frequency	Percentage %
Passive Smokers	282	83.2
Non passive smoker	57	16.8
Total	339	100

Table 2: Estimate of the prevalence of passive smoking among 339 adult patients attending a primary care clinic, King Khalid University hospital, Riyadh, Saudi Arabia

The places	Frequency	Percentage % *
Home	28	8.3
Work	105	31
Car	97	28.6
Public places	252	74.3

\* More than one place was allowed to be chosen if needed

Table 3: The most common Places where Passive smokers were exposed to Smoking hazards

Disturbance	Frequency	Percentage %
Yes	282	83.2
No	57	16.8
Total	339	100

Table 4: Did passive Smoking disturb you?

Care about you	Frequency	Percentage %
Careless	282	83.2
Careful	57	16.8
Total	339	100

Table 5: Do you think smokers care about your health?

Obligation to stay	Frequency	Percentage %
Yes	271	79.9
No	68	20.1
Total	339	100

Table 6: Were you obliged to stay in that place to finish your task?

## Discussion

The current study highlighted the preliminary estimate of the prevalence of passive smoking among adult male patients attending a primary care clinic, at a university teaching hospital, to be 83.2%. Also this study showed that public places were the most common places where most non-smokers were exposed to the hazards of passive smoking. Non-smokers who are exposed to secondhand smoke at work increase their risk of lung cancer by 20%-30%, and are susceptible to immediate damage to the cardiovascular system(7,8). Furthermore, in healthy young adults, prolonged passive smoke exposure is associated with arterial endothelial dysfunction, a key early event in atherogenesis(9). Although most epidemiologists think there is a link, it is the size of the effect that surprises them(10,11). An unavoidable consequence of active smoking at home, workplace, and public places is passive smoking. It has been recently reported that acute Passive smoking impairs vessel function in humans(8,9,12). Health benefits can be expected if people are protected from passive smoking(13). This study showed that most passive smokers, 83.2%, were unhappy and disturbed by smoking hazards, and most of them think that active smokers are careless about the environment, while 79.9% of passive smokers had difficulty leaving the place because it is shared and

they have their own task to finish during that time.

In 1986 the Surgeon General of the United States published a landmark report, based on epidemiological evidence, asserting a direct link between exposure of non-smokers to environmental tobacco smoke and disease, most notably, lung cancer. In the same year, the National Academy of Sciences reported similar conclusions regarding the adverse effects of exposure to environmental tobacco smoke. In 1997, the California Environmental Protection Agency published the final draft of a report regarding all known health effects of exposure to environmental tobacco smoke, including ischemic heart disease, lung cancer and bronchitis. More than 50 studies on passive smoking and lung cancer risk in never smokers, especially spouses of smokers, have been carried out and published within the past 25 years. These studies show that there is a statistically significant and consistent association between lung cancer risk in spouses of smokers and second-hand smoke from the spouse who smokes. This excess risk is in the order of 20% for women and 30% for men. The excess risk increases with increasing exposure. It has been described that there is an increased risk of lower respiratory diseases in children of smoking parents and an increased risk of asthma. The results from these

reports have increased the debate on smoking and environmental tobacco smoke's health impact on non-smokers and set off controversy regarding smoking in the workplace and public buildings. Tobacco combustion results in the formation of mainstream smoke and sidestream smoke. Cigarette smoke that is drawn through the tobacco into an active smoker's mouth is known as mainstream smoke. Sidestream cigarette smoke is the smoke emitted from the burning end of a cigarette. Environmental tobacco smoke results from the combination of sidestream smoke (85%) and a small fraction of exhaled mainstream smoke (15%) from smokers. For the most part, the chemical compositions of sidestream smoke and mainstream smoke are qualitatively similar and most toxic carcinogens are present in both of them but in different concentrations because of ageing and dilution with ambient air(14).

Passive smoking prevalence is very high in children with lower respiratory tract infections and in healthy children. A higher discordance was present between the parental self-reports and urine cotinine levels. Severe exposure to passive smoking in children was correlated positively with lower respiratory tract infections. It was concluded that passive smoking was an important risk factor for lower respiratory tract infections in children(15). Exposure to parental

smoking has been repeatedly associated with reduced lung function among children in both cross-sectional and cohort studies. Maternal smoking, compared with smoking by other household members, has been most strongly linked with deleterious effects on childhood respiratory health(16).

Children's exposure to secondhand smoke remains a widespread and severe public health problem. Recent estimates suggest that 40% of US children live with a smoker. It is now well established that second hand smoke contributes to pediatric ear infections, asthma, respiratory infections, and other respiratory disorders with evidence that it impairs neurodevelopment(17).

Recent work confirms that tobacco smoke is a major, if not the major, indoor source of fine particulate pollution in developed countries. On a global scale, a large burden of obstructive lung disease symptoms is attributable to indoor combustion. Obstructive lung disease appears to predispose to a higher risk of adverse health effects from indoor particulate pollutants, especially second hand smoke(18).

**In Conclusion:** The Prevalence of passive smoking in Saudi Arabia needs to be further studied in a community based survey, as the preliminary estimate in this study showed high prevalence especially in public places. It is highly important to educate all families and communities about the importance of avoiding smoking in front of others, and to emphasize the importance of strict implementation and follow up of anti smoking regulation especially in public places.

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# Refractive Errors in the Bahrain Population

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## Introduction

Refractive errors including myopia, hyperopia, presbyopia, and astigmatism, are the most common eye disorders. They occur due to the weakening of the refractive power of the eye which results in vision impairment [1,2]. The refractive errors can be both genetic and environmental [3,4]. Genetics play a role in the shape and structure of the eye [5,6] and reading, watching TV and playing computer games are considered as environmental factors that may lead to myopia[3,4].

Information on the magnitude and distribution of refractive errors is important for public health care planning. However, limited population-based data exists on the distribution of refractive errors in the Bahrain population. A survey by the Ministry of Health showed that refractive error in Bahrain is ranked first among causes of visual impairment with a prevalence of 34% among the Bahraini population [7]. However more detailed information on the refractive errors in Bahrain has not been published to our knowledge.

## Method

Data for 17,936 eye patients between 10-35 years of age patients living in Bahrain during 2008 were included in this study, The data used for this study was obtained from "Bahrain Optician clinics" which is a large chain of opticians in Bahrain.

Statistical analysis was carried out using the built in functions of Microsoft Excel program, the program also used to construct different graphs.

## Explanations

These results have been identified through different sources, including a previous survey showing visual impairment in Bahrain.

The records acquired show digital data for 17,936 patients living in

## Abstract

**Aim:** The objective of this study was to demonstrate the prevalence of refractive errors in the Bahrain population.

**Method:** A total of 17,936 eye patients between 10-35 years of age living in Bahrain were included in this study. A data record for 2008 was collected from Bahrain Optician clinics. The records involved patients with refractive errors such as myopia (nearsightedness), hyperopia (farsightedness), astigmatism and antimetropia (one eye is myopic and the other is hyperopic).

**Results:** Out of 17,936 patients 54.6 % were myopic; 4.9 % hyperopic; 39.9% astigmatismic and 0.6% antimetropia. For myopia patients, the prevalence was the highest at 25.6% for patients between the ages of 15-19 and decreasing to 15.8% for patients of ages 30-35. The prevalence of hyperopia was 18.3% for patients of 15-19 years of age and increased to 22.9% for patients of 30-35 years of age. For astigmatism the prevalence was the highest at 21.3% for patients of 15-19 years of age and was lowest at 18.9% for patients of 10-14 years of age and for antimetropia the prevalence was the highest at

23.6% for patients of 20-24 years of age and was the lowest at 15% for patients of 10-14 years of age.

**Conclusion:** The prevalence of refractive errors varies across different age groups. Myopia has the highest prevalence followed by astigmatism, while antimetropia is quite rare. Furthermore, patients in the age group of 15-19 showed high susceptibility to develop myopia and astigmatism.

**Key words:** Refractive error, distribution, Bahrain population

Bahrain within the age group of (10-35) years in 2008. Each patient has 11 columns, 6 are only needed for the lens designer. The other 5 measurements were used to detect any refractive impairment in question. They are: age, right dioptric spherical (RightDSph), left dioptric spherical (Left DSph), right dioptric cylindrical (RightDCyl) and left dioptric cylindrical (LeftDCyl). The dioptric spherical measurement for each eye can be used to determine whether the patient is myopic or hyperopic. If the value is positive the patient will be diagnosed with myopia while a negative value indicates hyperopia. On the other hand, the dioptric cylindrical measurement for each eye refers to the incident of astigmatism. An affected person will always have a negative value while a normal eye is represented by a zero value.

According to the criteria illustrated above, we have used statistical and logical functions offered by Microsoft Office Excel program such as IF, AND, OR and SUM. For example, in Figure 1, the overall number of myopic patients within the age group in question was figured out by using the IF function. This was done by calculating the number of patients with myopia in the right eye only (RightDSph is +) and normal left eye (LeftDSph is nil). After that, we used the same technique to calculate the number of patients with myopia in the left eye (LeftDSph is +) and the right eye (RightDSph is nil). Then, we computed the number of patients with 2 myopic eyes (both LeftDSph and RightDSph are +) and finally we summed the three results up to get the overall number of myopic patients.

## Results

Figure 1 represents the distribution types of refractive errors of eye patients. Out of 17,936 patients studied 9,793 (54.6 %) were myopic; 887 (4.9 %) hyperopic; 7150 (39.9%) astigmatic and 106 (0.6%) antimetropic.

Figure 2 represents the distribution of myopia patients versus five age groups. The prevalence of myopia

from this study was found to be 1737(17.7%) for patients of 10-14 years of age, 2,510 (25.6%) for patients 15-19 years of age, 2,133 (21.8%) for patients 20-24 years of age, 1,861(19%) for patients 25-29 years of age and 1,552 (15.8%) for patients 30-35 years of age. The prevalence of myopia was the highest at 2,510 (25.6%) for patients of 15-19 years of age and decreased to 15.8% for patients of 30-35 years of age.

Figure 3 represents the distribution of hyperopia eye patients versus five age groups. The prevalence of hyperopia from this study was found to be 179 (20.2%) for patients of 10-14 years of age, 162 (18.3%) for patients 15-19 years of age, 194 (28.8%) for patients 20-24 years of age, 148 (16.7%) for patients 25-29 years of age and 204 (16.7%) for patients 30-35 years of age. The prevalence of hyperopia was 18.3% for patients of 15-19 years of age and increased to 22.9% for patients of 30-35 years of age.

Figure 4 (page 10) represents the distribution of astigmatism eye patients versus five age groups. The prevalence of astigmatism from this study was found to be 1,349 (18.8%) for patients of 10-14 years of age, 1,524 (21.3%) for patients 15-19 years of age, 1,440 (20%) for patients 20-24 years of age, 1,436 (20%) for patients 25-29 years of age and 1,401 (19.6%) for patients 30-35 years of age. Note that the variations in the prevalence of astigmatism over all group ages varies by approximately 1%.

Figure 5 represents the distribution of antimetropia eye patients versus five age groups. Antimetropia is a condition in which one eye is myopic and the other is hyperopic. In mild cases, antimetropia is usually well tolerated. The hyperopic eye is used primarily for distance vision while the myopic eye is used for normal reading which explains its rarity in patient records.

The prevalence of antimetropia was found to be 16 (15.1%) for patients of 10-14 years of age, 22 (20.7%)

for patients 15-19 years of age, 25 (23.6%) for patients 20-24 years of age, 19 (17.9%) for patients 25-29 years of age and 24 (22.6%) for patients 30-35 years of age.

Table 1 (page 10) represent types of refractive errors in the right eye, left eye and both eyes. Out of 9,793 myopic patients over the whole age range groups studied, it was found that 3.1% were myopic only with the right eye, 2.5% were myopic only with the left eye and 94% myopic with both eyes. For 887 hyperopic patients 12.2% were hyperopic with right eye, 13.5 % were hyperopic with the left eye and 74.3 % hyperopic with both eyes. For 7,150 astigmatism patients 11.2% were astigmatic with right eye, 13.6 % were astigmatic with left eye and 74.2% hyperopic with both eyes. As shown in Table 1 the prevalence of Hyperopia and astigmatism in the right/left eye is higher than the myopia in the Right/left eye. There was no significant percentage difference between left eyes and right eyes in patients for all three types of refractive error observed. The high percentage of refractive errors for both eyes for all three types are an indication that refractive errors are more common for both eyes.

## Discussion

This study showed marked differences in the prevalence of refractive errors in Bahrain's population with the prevalence of myopia being the highest among other eye refractive errors. The prevalence of this study is in agreement with other studies carried out in other countries in the region [8, 9]. This study showed that the occurrence of refractive errors varies across different age groups. These variations probably reflect contribution of both genetic and environmental factors [10,11]. It was shown clinically hyperopia and astigmatism are present at birth or at early age which is why these conditions are considered hereditary in nature. However myopia is very seldom seen at birth, but becomes more evident at the late ages, therefore it is believed that it occurs as a result of environmental factors,

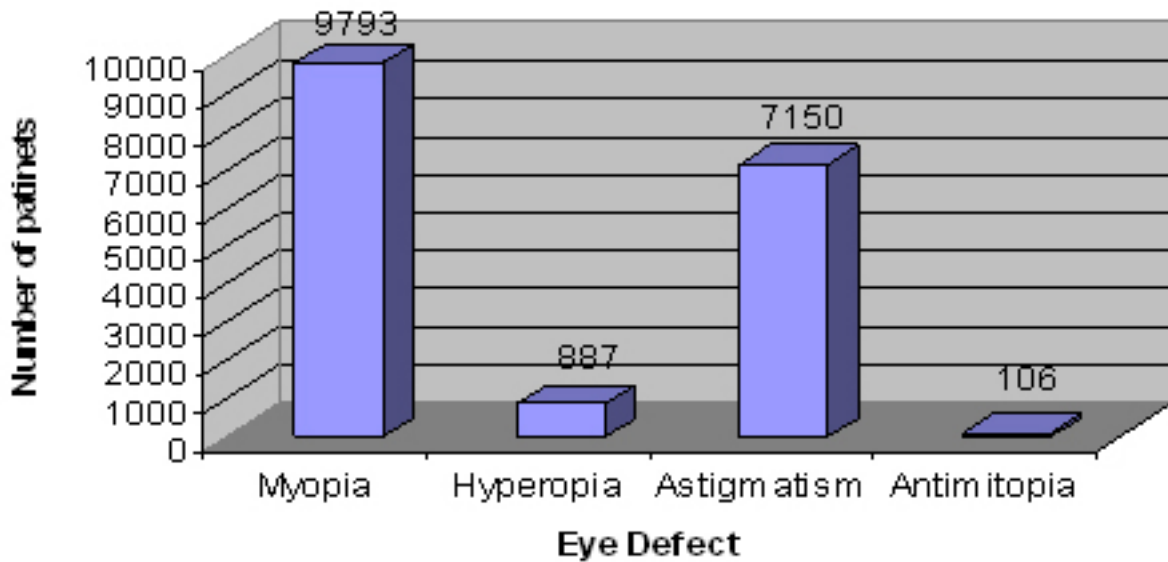


Figure 1: The distribution types of refractive errors among 17,936 eye patients

### Myopia

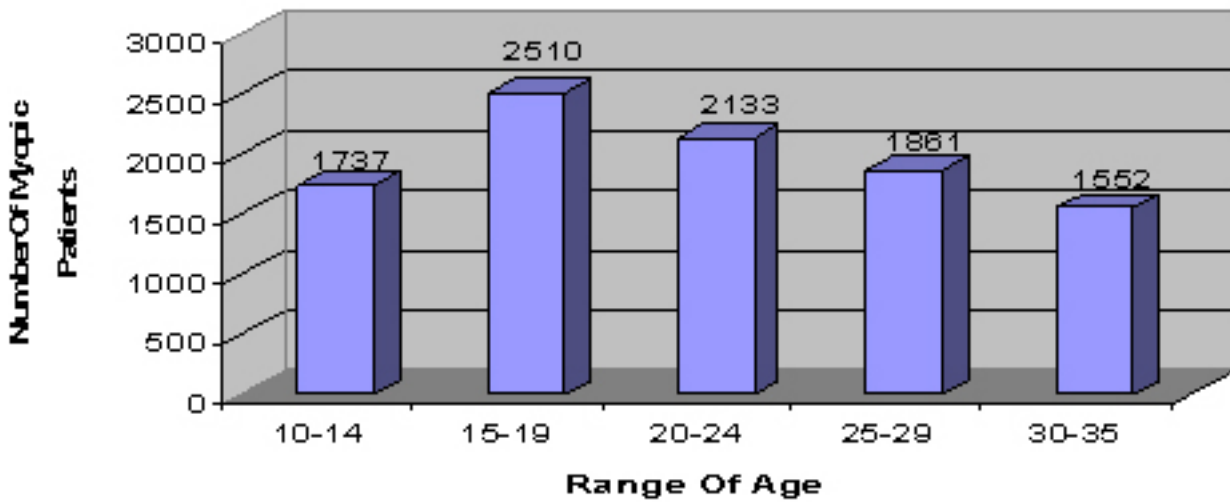


Figure 2: The distribution of myopia patients versus five age groups

### Hyperopia

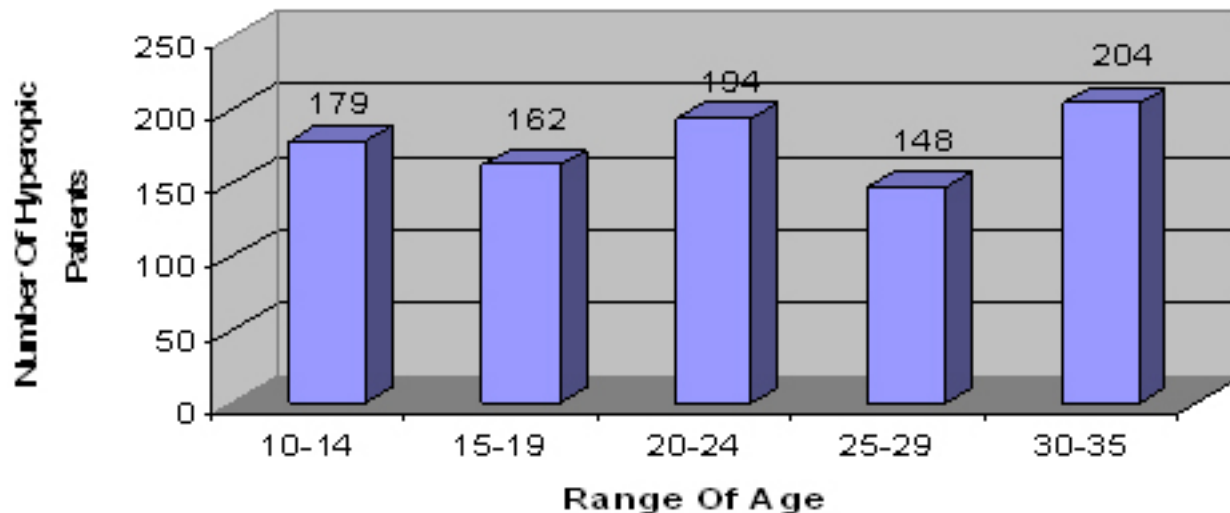


Figure 3: The distribution of Hyperopia patients versus age groups

### Astigmatism

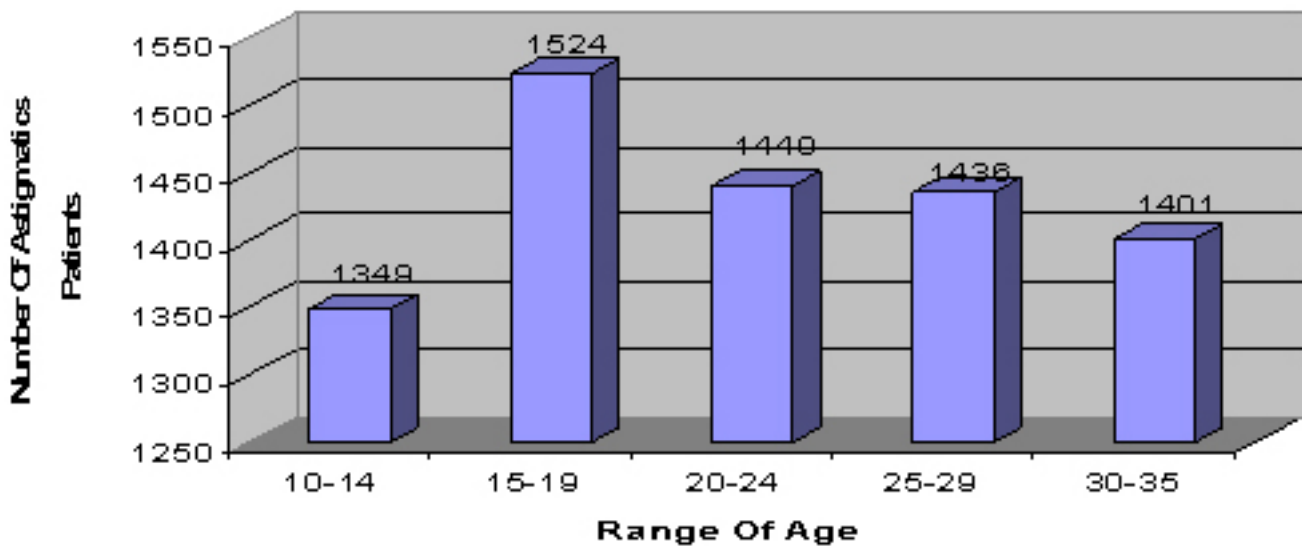


Figure 4: The distribution of astigmatism patients versus age groups

### Antimetropia

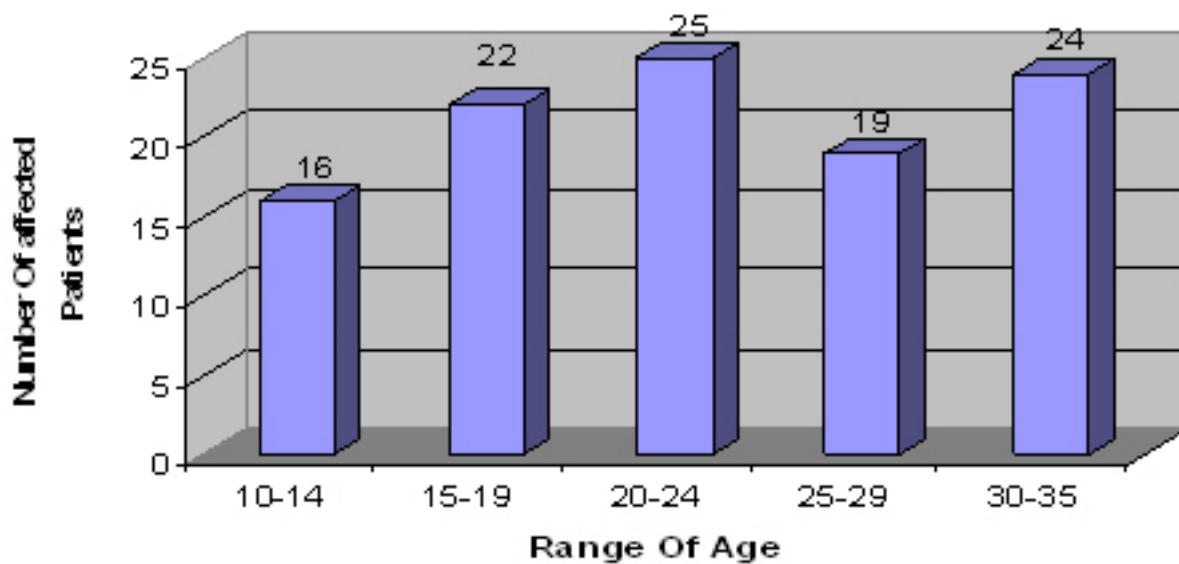


Figure 5: The distribution of antimetropia patients versus age groups

Type	Numbers	Right eye	Left eye	Both eyes
Myopia	9793	3.1%	2.5%	94.3%
Hyperopia	887	12.2%	13.5%	74.3%
Astigmatism	7150	11.2%	13.6%	75.2%

Table: Different types of refractive errors with right, left and both eyes affected

in particular significant amounts of near work activity contribute to the development of myopia. The high percentage of patients with myopia in the age group of 15-19 years is in line with studies conducted among school children at the age of 17 years in some neighboring countries [13]. Watching TV and spending longer times on computer games as well as the demand to cope with school and academic activity are all probable factors contributing to the high myopic percentage [2]. A number of studies have shown that the incidence of myopia increases with level of education. The prevalence of hyperopia is a less frequent type of refractive errors and found more commonly in the age group of 30-35 years. This may arise from the confusion between hyperopia with presbyopia, which also causes near vision problems but for different reasons [14]. This may lead to some misdiagnosing as to why there is such a higher number in the 30-35 year old patients. Many children are born with hyperopia, and some of them "outgrow" it as the eyeball lengthens with normal growth [14]. This explains why there are more hyperopic people in the ages 10-14 years old rather than 15-19 years old.

The highest percentage of patients with astigmatism was found in the age group of 15-19 years old. One possible reason is that the astigmatism rarely occurs alone and it is common that astigmatism accompanies myopia. This explains the high percentage in the age group of 15-19 years. Antimetropia is usually well tolerated; the hyperopic eye is used primarily for distance vision while the myopic eye is used for normal reading, which explains the low percentage in antimetropia.

One of the reasons behind conducting this survey is the lack of such statistical information in our region and hopefully this attempt is going to encourage researchers to start working on similar research that can assist further development in this area of expertise.

## Conclusion

The survey included the records of 17,936 eye patients. The prevalence of refractive errors varies across different age groups. Myopia has the highest prevalence. Patients in the group age 15-19 years old showed high susceptibility to develop myopia and astigmatism. This survey is an attempt to outline the prevalence of refractive errors in the Bahrain population. This study has looked at people who sought help for eye problems, as such it is not very inclusive but definitely opens the possibility for further research in this field.

## Acknowledgments:

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# Frequency of ABO and Rh (D) blood Groups in Al-hajouj Ethnic Group, Saudi Arabia

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## Introduction

Blood is man's complete and unchangeable identity. Although almost 400 blood grouping antigens have been reported, the ABO and Rh is recognized as the major (clinically significant) blood group antigens. This system derives its importance from the fact that A and B are strongly antigenic and anti A and anti B occur naturally in the serum of persons lacking the corresponding antigen, these antibodies being capable of producing hemolysis in vivo(1). Rhesus blood group system was the fourth system to be discovered and yet it is the second most important blood group from the point of view of transfusion (2).

Karl Landsteiner was the first person to put forward the ABO blood group system in 1900(3,4). After 40 years (1940-1941), Landsteiner and Wiener discovered that blood group antigens could be recognized with specific antisera and a vast number of antigens have been detected in human blood cells, of which about 10-15% are from well defined systems and only 1-2% play a significant role in blood transfusion. These blood group antigens are divided into many blood group systems. Each of these systems is inherited quite independently from all the other systems (2, 5, 6). Human blood antigens may be erythrocytic related, leukocytic related and platelet related (7). The need for blood group prevalence studies is multipurpose, as besides their importance in evolution; their relation to disease and environment is being increasingly sought in modern medicine (8, 9). Blood group antigens are not only important in relation to blood transfusion and organ transplantation, but also have been utilized in genetic research, anthropology and training ancestral relations of humans(9). The present study has been carried out to record the frequency of various blood groups in the population of Al-Hajouj,

## Abstract

**Background:** The need for blood group prevalence studies is multipurpose, as besides their importance in evolution; their relation to disease and environment is being increasingly sought in modern medicine. Blood group antigens are not only important in relation to blood transfusion and organ transplantation, but also have been utilized in genetic research, anthropology and training ancestral relation of humans.

**Settings and Design:** A community-based study was carried out on blood groups representing a random population sample from Al-Hajouj Ethnic group, Saudi Arabia.

**Aims:** To determine the frequency of different blood groups in AL-hajouj Ethnic Group, which would not only help in blood transfusion services, but also eliminate the risk of erythroblastosis fetalis in the neonates.

**Material and Methods:** ABO and Rh (D) typing was carried out over a period of six months, and included fifty individuals, with subjects from both genders; blood samples were collected from students of the college of Applied Medical Science - Aljouf University. A finger prick blood of a total of 2581 subjects, comprising 1123 females and 1458 males were tested for ABO and Rh(D) blood groups by routine slide method.

**Statistical analysis:** Data from study groups were analyzed by computer using SPSS(statistical Package for Social Science) to measure the frequencies and percentage.

**Results:** The blood group "B" was the predominant (36.23.0%) in both Rh positive and negative subjects among AL-hajouj Ethnic Group.

**Conclusion:** The frequency of ABO blood groups in both Rh positive and negative subjects among the AL-hajouj Ethnic Group was B>A>O>AB where the blood group B was the commonest among Rh positive subjects.

**Key words:** Blood groups; Rh factor; Transfusion, Saudi Arabia

with a view to generate data with multipurpose future utilities for the health planners.

## Methods

### Subjects

A total of 2581 subjects, comprising 1123 females and 1458 males, were screened for their blood groups. The subjects belonged to both rural and urban areas of Saudi Arabia.

### Collection of blood samples

A 2.0 ml sample of blood was drawn from the antecubital vein of each subject in a disposable syringe, and transferred immediately to a tube containing ethylene diamine tetra acetic acid (EDTA).

Determination of blood group

Blood grouping (ABO) and Rhesus factors (Rh), was done by the antigen antibody agglutination test. The antisera used were obtained from Plasmatec (Diamed, UK). ABO monoclonal reagents are in vitro culture supernatants of hybridized immunoglobulins secreting mouse cell-line. For determination of Rh factor, plasmatec anti D (1gm) Lo.-Du and LO-Du2 monoclonal reagents prepared from different antibody producing human B-lymphocyte cell lines were used.

## Results

Table-1 (page 14) shows the prevalence of ABO blood groups in the studied population, with gender distribution. The distribution of blood group in the total sample was 36.2%, 31.0%, 25.06% and 7.67% for groups B, A, O and AB, respectively. B group was dominant in both the genders, and AB was rare in both males as well as females.

## Discussion

In the study under discussion, the relative frequency of the various blood groups does not seem to deviate from those which have been recorded for studies on various segments of Saudi Arabia. However, comparison with the data from the British and African populations, presented in the same table, reveals that there is an equal dominance of group B and O in the Indo-Pak

Population	Frequency (%)				Reference
	A	B	AB	O	
Britain	41.70	8.60	3.00	46.70	(13)
India	24.70	37.50	5.30	32.50	(13)
Nigeria	24.43	23.88	2.75	48.94	(14)
Kenya	26.20	22.00	4.40	47.48	(15)
Hazara (Pakistan)	24.00	32.00	11.00	33.00	(16)
Swabi (Pakistan)	27.60	30.40	8.80	32.20	(17)
Peshawar (Pakistan)	28.00	34.00	7.00	31.00	(18)
Bahawalpur (Pakistan)	21.00	36.00	6.00	37.00	(19)
Al-Hajouj (Saudi)	31.03	36.23	7.67	25.07	Present study

**Table 2: Frequency of blood groups (ABO) in different populations**

sub-continent, in contrast to only O group for the British and African populations. The least reported group, in all the populations, has been AB.

It has been reported(10), that in the populations of the United States, Asian, Syrian Arabs and Palestinians, group O is dominant, with AB being the rarest. Racial (genetic) and environmental factors have been reported to influence the frequency of various blood groups in studies carried in various societies, including Bangladesh and Latin America(11). The genetic and environmental factors responsible for varying frequency of the blood groups among the Pakistani populace, needs to be probed further.

In terms of presence of Rh antibodies, the data from several studies on Pakistani as well as certain African populations is compared in Table 2. The present study has shown comparatively the highest percentage of Rh negative cases, however, is still very low and follows the global trend of being significantly rarer than Rh positive individuals.

An association of several diseases, especially cardiovascular, which has been reported over the years(12), would make the data generated

by the study, be useful for health planners, while making efforts to face the future health challenges in the region.

In short, generation of a simple database of blood groups, not only provides data about the availability of human blood in case of regional calamities, but also serves as a forewarning of future burden of disease. Such studies need to be carried out at regional levels, wherever humans reside.

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Blood Group	Total Subjects % (n)			Male Subjects % (n)			Female Subjects % (n)		
	Complete	Rh+	Rh-	Complete	Rh+	Rh-	Complete	Rh+	Rh-
A	31.03(801)	31.08(716)	30.69(85)	34.84(508)	34.96(460)	33.80(48)	26.09(293)	25.91(256)	27.41(37)
B	36.23(935)	36.37(838)	35.02(97)	36.08(526)	36.70(483)	30.28(43)	36.42(409)	35.93(355)	40.00(54)
AB	7.67(198)	6.86(158)	14.44(40)	4.80 (70)	3.57 (47)	16.20(23)	11.40(128)	11.24(111)	12.59(17)
O	25.07(647)	25.69(592)	19.85(55)	24.28(354)	24.77(326)	19.72(28)	26.09(293)	26.92(266)	20.00(27)
Total	100.00(2581)	100.00(2304)	100.00(277)	100.00(1458)	100.00(1316)	100.00(142)	100.00(1123)	100.00(988)	100.00(135)

**Table 1: Prevalence of various blood groups (ABO and Rh) in the studied population**

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# Social accountability - a challenge for global medical schools

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## Introduction and Background

Evidence suggests that medical education throughout the world needs fundamental revision to meet increasing and changing needs of populations. With greater population growth, especially within developing countries, and the changing pattern of diseases towards non-communicable disease, emerging and re-emerging patterns of infectious diseases, growing poverty and inequity, increasing man-made and natural disasters, climate change and a resultant change in disease patterns, and increasing costs of medical services, it seems that current medical education programs are not able to fulfill the increasing and changing needs of present and future generations (1).

As a result, a fundamental revision in medical education is sought in both developed and developing countries, all of whom have doctor shortages contributing to inequity of access to care, particularly in rural and remote areas, and the draining of these human resources by wealthy countries luring qualified doctors from low income nations, to meet their own quotas. The basis of this amendment is to divert the present educational schema of medical schools toward a socially accountable one in which (2-7) all activities of medical schools are diverted towards the changing needs of populations (8). Therefore, the aim of the present article is to discuss the fundamental issues around this revision and also to provide a model for the socially accountable medical school.

## Ethics

The original ethical basis for medicine was the Hippocratic Oath, (9) which dealt with the fair treatment of individual patients, and the accepted modern version, is the Declaration of Geneva (adopted by the General Assembly of the World Medical Association at Geneva in 1948 and amended in 1968, 1984, 1994, 2005

## Abstract

In determining the design and structure of a socially accountable medical school, in terms of ethics, quality of health care delivery, and universal access to healthcare, we reviewed the bases of medical ethics, and what additions or refinements are needed to equitably deliver universal healthcare in the 21st century.

Medical schools should meet three criteria, i.e. educating medical students in sufficient numbers to quality international standards to meet national requirements for health professionals, conducting research and being a community advocate for national and regional health and medical problems and ensuring curriculum meets these, and thirdly, providing via suitably educated graduates, health and medical care to all members of society based on ethical guidelines. Moreover, medical schools should not only consider the needs of the communities which they serve but also deliver their services based on socially and culturally acceptable criteria.

The main criteria to be achieved globally by the socially accountable medical school, is universal access to quality healthcare within nations and across nations. Evidence suggests that nowadays medical schools are finding it increasingly difficult to meet the changing needs of their communities due to a variety of factors, with health economics the main barrier. Therefore, a fundamental revision is required in schema of medical schools to make them more socially accountable. This also requires a similar commitment from the government, health stakeholders and the society generally, as there will be no socially accountable medical schools until there is a commitment to parity and equity of healthcare for all, from society and governments. In turn, a socially accountable medical school must seek to contain the costs of education and educate students on cost effective treatment and processes of care. A socially accountable medical school therefore provides its services based on cost-effectiveness, relevance, equity and high quality criteria.

**Key words:** Medical schools, social accountability, revising concepts, ethics, equity, parity

and updated in 2006). The relevant clause relating to parity and equity of healthcare, states:

*I will not permit considerations of age, disease or disability, creed, ethnic origin, gender, nationality, political affiliation, race, sexual orientation, social standing or any other factor to intervene between my duty and my patient; (10)*

This declaration does not overtly refer to universal access to healthcare though this could be included under 'social standing'. The challenge is to include the health of all global populations within this framework. One process however may not necessarily meet the specific needs of all communities or nations, and it is incumbent on medical schools to meet these challenges if they are to remain viable and relevant to community needs.

More recently world and national bodies have made statements on equity and parity of healthcare for all and while progress has been made toward these aims more effort and focus is required to allow us to progress from the theory to a workable model for the 21st century.

There are many barriers to equity with the rising cost of healthcare the most pressing. This applies to both costs of educating students as well as delivery of healthcare. This has seen a variety of stakeholders, particularly NGOs, filling the education gap (for example, the Applied Sciences of Oncology courseware, sponsored by the International Atomic Energy Agency (IAEA) and the Regional Cooperative Agreement (RCA) of the United Nations was designed to overcome a world shortage of properly trained oncologists and is now used by 800+ universities worldwide (11) as well as development of innovative programs, in conjunction with medical schools, such as the Low Cost Effective Medicine Unit (LCEMU) at CMC Vellore, India, that ration the peripheral and non-essential facilities and services of healthcare in favour of high quality medical care for the poor.

Our 'socially accountable' medical schools therefore need to 'extend' the Hippocratic Oath and Declaration of Geneva to now include 'universal access to healthcare within nations and across nations' -

WHO has defined the Social Accountability of Medical Schools as *"the obligation to direct their education, research and service activities towards addressing the priority health concerns of the community, region, and/or nation they have a mandate to serve. The priority health concerns are to be identified jointly by governments, health care organizations, health professionals and the public."* (8)

Medical Schools have a responsibility to ensure their staff and alumni have the skills and attributes needed to meet the health needs of the communities in which they live and serve.

Social accountability requires health professionals to understand the health needs of their patients within the context of the global health arena, and contribute to addressing differences in population and geographical health status, while having the life skills required to live, work, learn and sustain themselves in challenging settings.

Medical Schools must acknowledge and accept being held accountable to society. (12)

Strategies are therefore required to allow existing national health funding to meet the needs of as many members of society as possible. This is critical in low income nations.

**A model for the socially accountable medical school**

Medical schools meet three criteria i.e. educating medical students, researching health and medical problems and providing health and medical care. One may consider these as the three angles of a triangle. However, to work properly, ethics should be placed within the middle of the triangle. In other words, without considering ethics, the three areas of medical school activities, and the focus of medical

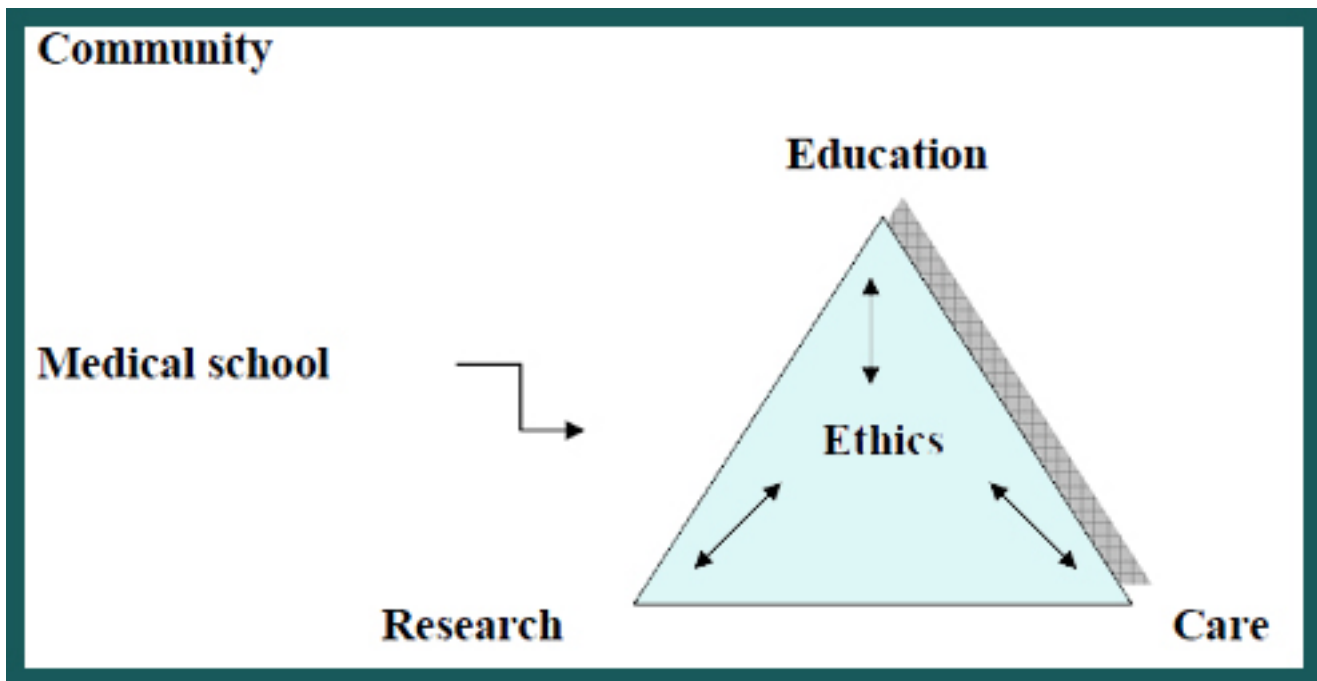
schools, might not go according to their intended plans. Moreover, these constellations are placed within communities which mean that medical schools in areas of education, research and providing health and medical care should not only consider the needs of the communities which they serve but they should also deliver their services based on socially and culturally acceptable criteria (Figure 1 - opposite page).

Therefore, it seems that socially accountable medical schools should be considered as the new generation of medical schools around the world. In what follows the most important characteristics of a socially accountable medical school will be discussed in its three areas of activities.

**Education**

A socially accountable medical school teaches all the relevant education in traditional formats e.g. lecture, and modern formats such as problem based learning (PBL) to educate its students. Similarly, it also applies relevant evaluation programs in traditional formats e.g. written exam and modern formats such as Objective Structured Clinical Examination (OSCE) or Objective Structured Practical Examination (OSPE) to evaluate its students (13-17).

Additionally, a socially accountable medical school teaches its students both basic and clinical sciences in an integrated scheme in the community setting as well as hospitals and clinics. A socially accountable medical school also provides educational opportunities for its student to learn how to work with people within the communities and how to assess and prioritise their needs and finally, how to deal with those determined needs (18 & 19). In doing so, they apply relevant knowledge, including social epidemiology, to teach their students about how important issues such as occupational health, effects of poverty on health, social networks and social support systems shape the community's level of health (20).



**Figure 1: Illustrating a socially accountable medical school**

**Research**

Although a socially accountable medical school should conduct research in all areas of knowledge i.e. clinical and basic in order to extend the border of sciences, one of the most important areas of its research must be related to the health problems of its attached community (21 & 22). Therefore, enough funding should be provided by the medical schools for Health System Research (HSR). Moreover, given the important role of medical students in HSR, in terms of recognizing and solving health problems and promoting research capabilities of medical students, the necessary steps should be taken by a socially accountable medical school to involve its medical students in such types of research (23-27)

**Providing health and medical care**

In fulfilling education and research activities, medical schools should provide health and medical care for their attached community through different hospitals and clinics and through public health campaigns. A socially accountable medical school diverts its health and medical care towards the needs of its community. Moreover, a socially accountable medical school tries to provide its care based on the highest possible quality through an equitable and socially acceptable schema. To do

so, a socially accountable medical school must define its catchment area, enumerate its population, determine medical and health needs of the population and fulfill these needs, ensuring accessible services in terms of location and affordability (28 & 29).

Ethical guidelines and advocacy for public health measures and education are arguably the best way to lower national healthcare costs in developing nations, but of course such nations can ill afford the infrastructure and services required.

The socially accountable medical school includes these criteria within their educational scope.

As already stated, ethics are the basis of all activities of socially accountable medical schools. This means that education, research and providing health and medical services must be based on ethical guidelines sensitive to the local cultural and social norms. Considering ethical guidelines is also important in research activities of socially accountable medical schools, in order to avoid research misconduct (30-35). In terms of providing health services based on ethical issues, a socially accountable medical school should also provide its services on the basis of cost-effectiveness,

relevance, equity and high quality criteria (36).

These issues need to be kept in mind when selecting the right academic staff to meet these needs as well as to provide the appropriate internal structures and committees to retain focus on these needs.

**How to select the best students for the socially accountable medical school**

A socially accountable medical school should have the opportunity to select its students based on the best available criteria. Otherwise, the graduates of socially accountable medical schools may not be able to meet the changing needs of their communities. Therefore, a set of standard criteria should be developed for accepting medical students based on their abilities, skills and motives to work within the community (37). There is a move toward non scientific criteria such as compassion, organisational skills, integrity, communication skills, and empathy. There is also the need to match the best resource people to meet the needs of particular sections of the community.

For example, evidence suggests that those students who come from rural areas in comparison to students who originated from urban areas, are

more interested in working within rural communities, which can facilitate rural placements of doctors. (38) Furthermore, socially accountable medical schools should also educate their graduates in a way so that they understand the value of continuing medical education all through their working lives. Therefore, they should apply for such programs whenever they are available (39). Postgraduate Continuing Professional Development (CPD) programs include psycho-social issues of patient care and issues of ethics and reinforce their value.

Finally, a socially accountable medical school should ensure that there are sufficient employment opportunities available for their graduates and that their graduates are able to work with, and more importantly, to manage their health teams in order to bring equitable and acceptable high quality services for all the people in the served communities (29). Graduates need to become leaders in the formulation of community healthcare initiatives. The roots of ill health lie in poverty, discrimination, lack of education, maldistribution and misuse of often scarce resources; and in any given country, those who identify health issues, act on health determinants, decide on the use of resources, deliver health services, or train health manpower, are usually different groups that may not share the same value system and priorities. Thus, fragmentation is a serious threat to the efficiency and effectiveness of health systems everywhere and the socially accountable medical school and graduates, should be suitably qualified to act as an advocate for the patient within this fragmented system and maintain an appropriate focus.

**Challenges**

Health care has become a central public issue and is no longer seen as the prerogative of doctors or medical schools. Governments, the public and the medical profession recognise that medical education has not kept pace with the health-care needs of populations around the world. Problems in medical education have

been clearly documented over many years and efforts are being made to find solutions.

These problems include new patterns of disease in developing and developed countries, inadequate health-care systems and a shortage of the right kind of doctors, ie, generalists as opposed to specialists. Aging populations, chronic disease, and rehabilitation medicine are making increasing demands on health services. Public health issues and social problems such as maternal and child health, AIDS, and alcohol and substance abuse, are presenting major challenges for health-care and for medical education. (37)

Currently medical education does not have strategies for socio-economic affected medicine. That is, for when doctor poverty means there is lack of diagnostic equipment and for when patients cannot afford prescribed treatment. While this poverty is a condition of society itself, in the absence of the society addressing these needs or providing appropriate budgets, medical schools must take on this charter themselves. This issue needs to be worked into both medical education and healthcare delivery.

Additionally many national health costs can be grouped under problems of public health. The socially accountable medical school should also be an advocate for and produce strategies for public health initiatives. Public health is in effect, preventive medicine and focus on this area not only cuts the burden of disease but also population health costs, making it a community priority.

**Conclusion**

Medical schools should revise their educational, research and medical and health services in a way that enables them to fulfill increasing and changing needs of the communities they serve. This means that social accountability is the fundamental agenda for the medical schools in the present era. However, to become a successful medical school, all socially accountable medical schools should

conduct regular internal evaluation and also should be opened to any external evaluation by the relevant authorities.

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# Should medical ethics researchers care what the public thinks?

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## Abstract

The relationship between bioethics and public policy is becoming an important topic particularly with the new and rapid development in biotechnology. The question arises as to whether medical ethics researchers and/or bioethicists should care what “members of the public” think? In this article I will attempt to show that although there are reasons to believe that public opinion should be taken into account by policy makers, it is important to realize that not all that the public says can, or should, be taken as a norm. I shall begin by offering three main contentions to effect that public opinion cannot be relied on and then move on to offer three reasons as to why medical ethics researchers should consider what members of the public think, thus arguing that each has an important role to play: It is like a scientific orchestra. The public, the researcher, and the policy makers are musicians. Each has an essential instrument to play. However, the maestro is the one who leads the symphony. The conductor is the erudite ethicist. His/her duty is to ensure the symphony does not go out of tune.

**Key words:** Medical Ethics Researchers, Bioethicists, Public Opinion, Public Policy

## Introduction

The relationship between bioethics and public policy is becoming an important topic particularly with the rapid development in biotechnology. Policy makers often seek the council of medical ethics researchers. The question however, is whether results obtained from what came to be known as “market research” should affect decision making. Put differently, should medical ethics researchers or bioethicists care what “members of the public” think?

In this article I will attempt to show that although there are reasons to believe that public opinion should be taken into account by policy makers, it is important to realize that not all that the public says can, or should, be taken as a norm. It is like a scientific orchestra. The public, the researcher, and the policy makers are musicians. Each has an essential instrument to play. However, the maestro is the one who leads the symphony. The conductor is the erudite ethicist. His/her duty is to ensure the symphony does not go out of tune.

Generally speaking, ethics is a branch of philosophy that deals with right and wrong. An ethicist is someone who is involved in ethical thought. Socrates was an ethicist concerned with questions like what

makes a life worth living? and what is the good life? With time, a kind of paradigm shift occurred and an ethicist became someone who is not only involved in philosophical speculations but also actively engaged in issues that affect the core of individual lives. This is more so with what came to be known as medical ethicists or bioethicists. A bioethicist is concerned with real or potential healthcare issues and decisions and, as such, is involved and accountable. He/she is an engaged intellectual, an activist, a reformer in many ways. Bioethicists can and often do assist scientists in pondering the ethical repercussions of their research, and offer insight into unforeseen consequences of new technologies. However, one cannot but wonder whether people whose concerns are at stake should not also be involved in the process of deliberation, thus, the relevance of public opinion and market research.

The rapid development in science and biotechnology has created a new set of opportunities for everyone. Yet, this century, perhaps like no other, has also created a high level of anxiety toward what Fukayama called our posthuman future. In addition to it becoming a political matter, bioethics also became a public one. Can one do bioethics outside the public arena? And if

not, considering the pluralism that characterises today's society, to what extent can we actually gain from the voice of the public? Ancient democracies like that of Athens showed the importance of public opinion in affecting the role of decision makers. Rightly or wrongly, the people had a say in important matters. Their voice was the one which ultimately led to the death of Socrates who, as we see Plato's Crito, contends that it is better to pursue the counsel of the wise and live well than to follow the arbitrary erratic public opinion and live defectively. The latter, he says, "cannot make a man wise or foolish".[1] Public opinion is generally defined as "an aggregate of the individual views, attitudes, and beliefs about a particular topic, expressed by a significant proportion of a community".[2] Surowiecki, investigates an idea with tremendous implications: large groups of people are sharper than the few albeit brilliant elite. They are better at coming up with sensible resolutions and improvements and even at foreseeing the future: "Even if most of the people within a group are not especially well-informed or rational, it can still reach a collectively wise decision".[3] Yet, American sociologist Cooley argued that public opinion is a process of interaction and reciprocal influence rather than state of common conformity. So which one is it? If Cooley was right, one cannot but doubt the relevance and objectivity of majority opinion.

Suppose a group of scientists were capable of introducing genetic changes into early embryos which become integrated into all cells of the body and then are passed to future generations. These changes will ensure your children will be more intelligent, healthier, taller, stronger etc. would you want this procedure? Suppose that market research revealed that 87% of the population approved of the research, does this mean that researchers ought to continue working on it? Should this opinion be taken as binding to medical ethics researchers and hence constitute a green light for scientist to go ahead with the

experiment? Should we move from 87% of the people approve it to it ought to be done?

There are many simple contestations at this point: such as questions about whether the public is aware of the consequences of enhancement or whether it is capable of putting restrictions on it. In what is to follow, I shall begin by offering three main contentions to show that public opinion is relative and hence we cannot move from "the majority of the people approve it" to "it ought to be done". 1) the public can be misled by the media, 2) public opinion suffers from internal inconsistencies, and 3) the argument ad populum is misleading.

**1. The power of the Media:**

To begin with, populations might be misled by media, propaganda, companies, stock market etc. Some of the aforementioned means of information diffusion are not as authentic as one wants them to be and some are even unethical and profit-oriented instead of truth-oriented. The media today is one of the most controversial means of conveying information to the public and of influencing public opinion. It is skilled in making emotive and often poignant appeals which are not always well informed (and quite often contradictory) and consequently, the opinion of the public ends up by being formed by emotional reactions without a proper reflection. A typical example is the role it played in waiving public opinion regarding decisions related to the cases of PVS patient Teri Schiavo in Florida who, in 1990, suffered a cardiac arrest involving brain damage from anoxia. The public was highly involved in this case, but there were too many uncertainties, the most important of which was whether actual facts were presented to the public. Racine of the Institut de recherches cliniques de Montréal (IRCM), and experts from Stanford University in California and the University of British Columbia, examined the media coverage of the case and were surprised at the prevalent degree of inaccuracy: "Our observations show that the press capitalized on

the controversy to a large extent, and selling copies mattered more than delivering scientific information. Media coverage sustained myths and false hopes." [4] In a survey of media reporting regarding the MMR vaccine debate in 2002, Boyce, a researcher in media studies at Cardiff University, presented the media's significant bias against the MMR vaccine arguing that the coverage informed parents what and how to think about the vaccine. The media gave the impression that the vaccine might be risky and that science and governments are not trustworthy (2008). What, how much and how is reported makes all the difference. The media targets the emotions of the viewers and at times skews their reasoning.

**2. Internal Inconsistencies in public opinion:**

One of the issues linked to public opinion is its consistency as a marker of its validity. Religious beliefs also play a role in shaping public opinion; agnosticism, atheism or materialism being equally belief systems. In various matters, the public appears puzzled, their ideas lack some internal consistency and they seem to be holding contradictory views. The public can agree to the right to self determination yet vote against euthanasia. They can argue that life is sacred and hence abortion is wrong, yet at the same time, think it is morally acceptable to go ahead with stem cell research in the process of which embryos are destroyed, because, they argue, it will help people "walk again". Also, public opinion is fickle. It changes with developments, particularly sharp developments. In Lebanon, the Sunni public opinion sharply moved to support the resistance as a result of the Israeli carnage in Gaza after its being, in majority, against it. Pressure groups, and often governments that are effective, take advantage of such developments to influence policy. Sometimes they even stage such developments. By tracing public opinion polls over time one can map the public mood and thus be in a position to make relatively accurate predictions and thus be able to manipulate them.

In addition, it seems that the ultimate obstacle to an accepting of public views lies in the way questions are framed as well and in the absence of clear views: “pollsters who do seek a more thorough understanding of public attitudes find a marked lack of knowledge of the basic facts and even an acknowledgment of that ignorance - resulting in uncertain and highly malleable opinions”. [5] As reported by Levine, “[p]ublic views on even the most familiar of the policy questions surrounding stem cell research are easily swayed in either direction by different framings of the facts and formulations of the questions, and sometimes the same respondents offered starkly opposite answers to similar questions asked in different ways”. [6] Polling itself has many problems. [7] Still, even if policy is affected by public opinion, one cannot but wonder about the quality of that opinion: was it well informed? What influenced it? Was it manipulated?

### 3. The fallacy of the argument ad populum

Let us now look at the initial assertion from a different perspective. It is often the case that researchers commit the fallacy of trying to win popular agreement by stirring the emotions and enthusiasm of the masses (argumentum ad populum). The fact remains that just because an idea is common, does not necessarily guarantee that it is correct. One of the main problems with this fallacy is that even if 87% of the people agree on X, this does not mean that X is right.

The main confusion of the argument ad populum lies in the fact that in democracies, the fallacy becomes irrelevant since it is the majority that decides (one need not reiterate Toqueville’s and Mill’s arguments about the tyranny of the majority, which, even if significant, is beyond the scope of this article). Yet, this is so not because democracies are infallible, but because the ultimate say finally rests with the majority. Nonetheless, the public is not infallible and this is precisely why people elect ‘experts’ to guide them. Experts are expected to

use their expertise and thus the plebiscites should not be involved in all decisions. While experts like Pellegrino believe that “bioethics is everybody’s business” since biotechnology “can affect who we are, what we are and what it is to be human when you deal with such things as enhancement, regenerative medicine, reengineering the humans species” [8], others like Kass endorse a technocracy where decision making is left to those who are “most informed and most reasonable, and therefore most competent to make decisions” [9] the “moral expert” (hereafter expert for short).

Notwithstanding, this is not to say that the voice of the people is worthless. The vox populi in the majority of the world voiced their disagreement to the war on Iraq. The “experts” thought otherwise and their decisions were uninfluenced by public opinion. They were wrong. Experts are not gods. Thus the question: Should we concede to expert opinion (unaided by that of the public)? Who are the “experts”? Do they exist to begin with? While Plato spoke of the philosopher- king as somebody who might approximate an expert, Socratic scholars believe Socrates to have been sceptical about the existence of such a person or to have anything encouraging to say about those who claim such an expertise. [10] Ayer discarded the notion altogether and argued that “it is silly, as well as presumptuous for any one type of philosopher to pose as the champion of virtue”. [11] He asserts that the people “mistakenly look for the moral philosopher for guidance”. Although the issue of the existence of experts is as relevant today as it was since the days of Socrates, it remains true that the public needs a group of people, having proficiency and autonomy, to offer credible judgment on certain matters, a credibility that is not ascribed say, to plumbers. Experts need to have a certain knowledge-base and certain skills. Still, what makes an expert, if any, is beyond the confines of this article. Suffice it to say that not anyone can perform this role. Can any thoughtful person, say a bartender, a hairdresser,

willing to listen and give time, do counselling? They certainly are much less expensive than psychologists and some might say much more fun, but they cannot; they should not. During the war on Iraq and the Abu Ghraib scandal, politicians and lawyers in the US administration tried to cast doubt on what constitutes torture and when callous “non-torture” methods (used by medics) are acceptable means of interrogation. According to a witness, the abuse was “to get these people to talk.” Another said that male captives “were made to wear female underwear, which I think was to somehow break them down”. [12] When authorities tried to cast doubts (a very efficient method), the puzzled public needed to hear the opinions of experts like Caplan or Miles who wrote extensively on the subject. Yet, if public opinion has its shortcomings, so does that of the experts. Experts, like everyone else, have their own bias, which ideally should not affect their decisions. They have their own training and background, their personal beliefs, etc. Occurrences in history have revealed that appeal to expert authority is not always the best option: the late 19th C and early 20th C state-sponsored eugenics program for involuntary sterilization of the ‘unfit’ and the ‘feeble minded’ received wide backing from experts. Later, such laws were deemed wrong and challenged. Henceforth, at times, expertise ought to be aptly contested.

Take a bioethicist who comes from a catholic background and is being consulted on matters related to stem cell research. Such an ethicist has put a ban on the research while the public has been awaiting the results. Among many examples we witness in hospitals is that of a quadriplegic who, like Christopher Reeve, was hoping stem cells could make him walk again, or patient A who suffers from ALS at a time when the state has banned stem cell research. Some bioethicists believe that stem cell research should be prohibited because human embryos are destroyed in the process of harvesting the cells. When the president of the US halted the research on that ground based on

his advisor's advice, he was accused by the public of stopping science for religious and political reasons.[13] Patient A, once an active biochemistry teacher, now, almost an invalid and confined to a wheel chair, deteriorates, is hospitalized, yet refuses treatment and requests a DNR. The doctor tells him that he can still make it, talks to him about stem cells. The patient argues that even if he were to survive extubation, he will only worsen since the state banned such research. Sometimes the public is the person involved and the medical ethics researchers are the theoreticians who need to hear the narratives of the patients who are the heroes of the stories researchers are trying to write about. It is important to avoid exerting 'moral tyranny', to move away from personal histories and circumstances and try to redefine a basic set of morality that can be integrated into the lives of people. Thus, many, like Baker [14], now are considering the possibility of an International Bioethics. Whether this is possible considering the diversities between cultures is an interesting issue to pursue. Still the fact that there are core values and some moral absolutes does not make that all too impossible.

At this point, one might want to consider a body of experts from different backgrounds debating matters of bioethics before deciding about public policy issues in order to seek a reflective equilibrium. Put differently, perhaps a body of experts should meet in a situation similar to Rawls' "original position" behind a "veil of ignorance" (VOI) and decide on these matters. The VOI deprives people of the knowledge of the most specific particulars about themselves and their society and hence whatever decision these "experts" will reach will be conducive to the greatest benefit for humanity as they can judge it. This is not to say that there are no shortcomings to that for this assumes a capability of foreseeing the future which finite human beings cannot possess.

So, where do we go from here? From the above we conclude that public opinion should not blindly affect

the decisions of bioethicists and bioethicists should not stand high on their pedestal while making decisions that concern the lives of people.

The freedom of scientists to pursue research is not unleashed ad infinitum, nor is the public the final arbitrator. The freedom of the researcher is often trumped by the right of the populace the research affects. Bioethicists are entrusted to ensure that these rights are protected. At times the experts do not have all the facts and need to know more about the other story. Hence, public opinion matters and it is relevant to see why people think the way they do and hence to take market research to be meaningful in some respects. It is like an orchestra with three responsible players: The researcher, the expert, and the public. When one goes out of tune, the symphony will not be as perfect as one initially envisioned it and all the stakeholders will be affected, if not instantaneously, sometime in the future.

While matters pertaining to bioethics cannot, and should not, be decided by the public (to say that morality is a function of public opinion is a dangerously precarious conjecture), medical ethics researchers should consider what members of the public think for several reasons, the most important of which are:

1. Issues discussed affect the public. Going back to our thought experiment, if a group of scientists managed to genetically enhance children, these children are going to be those of the people. The enhancement is not going to be only an intellectual breakthrough, or a research paper. It will inevitably find its way to real babies whether through the second stage experimental procedures or when well off people decide to have it done to their offspring. Although of great magnitude, the consequences and repercussions of such enhancements will not be discussed in this article.

2. Public opinion allows medical ethics researchers to see different perspectives. It makes them see

new values and perhaps replace old beliefs with a new set of ideas. In medicine, the physician often sees the perspective of the doctor and very rarely that of the ailing patient. Public surveys about public perceptions allow doctors to see that perspective and taking such surveys seriously, gives them a chance to examine themselves critically. Educated public views enhance the search for truth. Public opinion will necessarily have to be an educated one. Criteria and standards for participation in public polls will have to be set for opinion to be considered valid and useful.

3. Society is a collective of competent persons (at least those who are asked to give their opinion). When it comes to matters affecting their healthcare plans, why would we deny them this autonomy and revert to the paternalistic model on the hand of 'experts' who, to begin with, were the ones who came up with the autonomy model? If bioethicists or medical ethics researchers decide not to care about what the public thinks, then bioethics as a discipline and bioethicists as a collective of experts, will have to convince the public that it is not their right to decide on this matter, or at least, to partake in the decision. This is morally problematic, let alone inconsistent: how can the champions of autonomy and the right to self determination deny individuals the right to have a say in what concerns them?

In what preceded I tried to show that although important and useful in many respects, public opinion cannot, and should not, shape the decisions of medical ethics researchers which in many ways, I referred to as experts and, as stated by Colman et al, "Sound policy-making should not simply follow public opinion. It has to address two questions: have the possible consequences of a policy been considered adequately? How cogently are both the consequences themselves and the route to their achievement, defended in moral terms?" [15] Going back to our thought experiment, genetic enhancement will have to be done by the medical researcher. The public is not a spectator. There are issues and

consequences to consider that, at times, only the skilled intellectual eye of the expert can see.

We live in a morally pluralistic society and the voice of the people needs to be heard. Still, while it is beneficial that it be heard, it is important that it be known that they do not speak for everyone. Ethical considerations should supersede considerations like majority votes, political agendas, or profit. Generally, it is to the experts, the medical ethics researchers, that we entrust the good of people, hoping that they will overcome their personal bias and learn from the public what, perhaps, their expertise prevented them from seeing. The philosopher-king is wise enough not to abuse his power, but until "philosophers become kings, (..), there can be no rest from troubles".[16]

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# Clinical Significance of Cadaveric Dissection For Future Clinicians

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## Abstract

Changes in the undergraduate medical curriculum in the medical schools of Kingdom of Saudi Arabia are being made without any research into the key aspects of knowledge necessary or comparing methods of teaching. Dissection is the basic learning tool of Anatomy both at under graduate and post graduate levels. More recently questions have been raised regarding the value of dissection in medical education. In the past decade, there has been a decline in the teaching of anatomy by cadaver dissection. This study highlights the facts that dissection can impart anatomical knowledge as well as offer other relevant, positive learning opportunities to enhance the skills and attitudes of future clinicians. **Methods:** A comprehensive questionnaire in English as well as in Arabic was distributed to the final year students at College of Medicine and interns of King Khalid University Hospital, King Saud University during the period 2008-2009, to ascertain their perception about relevance of the dissection course in gross anatomy curriculum that they had experienced in their first year at medical school 5 years earlier and their wish to repeat topographical anatomy during their clinical teaching to enhance their knowledge for everyday practical work in the ward. In this study 250 final year students and 150 interns were recruited.

**Results:** In the present study 250 final year students and 150 interns were invited, and 89% students and 86.6% interns responded to the questionnaire. Furthermore, 84.3% final year students and 87.6% interns showed interest in short specialized dissection courses during the clinical curriculum.

**Conclusions:** The present study result shows that medical students and interns expressed that the cadaveric dissection remains the most powerful means of presenting and learning anatomy as a dynamic basis for solving problems during their clinical teaching.

**Key words:** Cadaver, Dissection, Anatomy, Curriculum, Medical Education

## Introduction

Cultural changes, scientific progress, and new trends in medical education have modified the role of dissection in teaching anatomy in today's medical schools. Cadaveric dissection offers an active, hands-on exploration of human structure, provides deep insights into the meaning of human embodiment and mortality, and represents a profound rite of passage into the medical profession. Anatomical societies should include sessions on teaching aspects, and the decision makers in medical faculties should be informed about internationally documented pros and cons of anatomy, not only for the undergraduates but also for the specialization of physicians [1]. The current practice of dissection is described for some universities in the United States and Europe, showing its use as a learning tool [2]. Apart from learning to cope with the overt "emotional confrontation" with the cadavers, which assists anatomical learning, some essential covert learning outcomes were identified by the students including: teamwork, respect and familiarization of the body, application of practical skills, integration of theory and practice, preparation for clinical work, and appreciation of the status of dissection within the history of medicine [3]. A number of medical schools in Saudi Arabia have either removed the practical, hands-on aspect of dissection in the medical undergraduate curriculum or are seriously considering such a measure, on financial and/or human resource grounds. In the United Kingdom most medical schools have traditionally included dissection as a major component of their anatomy courses and it is probable that in the UK dissection will continue to decline but that its reduced role will be prompted by the interactions of many complicated processes, only some of which will be educationally driven [4]. The traditional anatomy education based on topographical structural anatomy taught by didactic lectures and complete dissection of the body with personal tuition, has been replaced by a multiple range of special study modules, problem-based workshops, computers, plastic models and many other

teaching tools. In some centers, dissected cadaver-based anatomy is no longer taught. Changes in the undergraduate medical curriculum in the medical schools of the Kingdom of Saudi Arabia are being made without any research into the key aspects of knowledge necessary, or comparing methods of teaching. There is no agreement on a common national core curriculum and as a result, numerous new curricula have been introduced. No external audit or validation is carried out, so medical schools have been free to teach and assess their own work themselves. There is a great divergence in medical schools across the Kingdom in teaching medicine in general, and anatomy in particular. The reduction in undergraduate teaching and knowledge of anatomy has caused great concern, not only for undergraduates but also to postgraduate students, especially in surgery [5]. A thorough knowledge of anatomy is always required to produce better future clinicians in general and surgeons in particular. This should be mandatory as a preliminary to higher surgical training. The teaching of anatomy in surgical specialties must be improved, and the dissecting room still has a place in educating under and postgraduate students. These facts suggest that a sound knowledge of anatomy is essential, if the medical practitioner is going to accurately define and successfully treat the problem presented by the patient. The dissected cadaver remains the most powerful means of presenting and learning anatomy as a dynamic basis for solving problems. The cadaver must not be dismissed as obsolete. Dissection has survived the most rigorous test of pedagogical fitness--the test of time. The student-cadaver--patient encounter is paramount in medical education [5]. Anatomists considered dissection to be mainly an instrument for professional training and to help develop professional skills [6]. The practice of dissection, as part of undergraduate medical education, has recently resurfaced in the public eye, therefore, this study highlights the fact that dissection can impart anatomical knowledge as well as offer other relevant, positive learning

opportunities to enhance the skills and attitudes of future doctors.

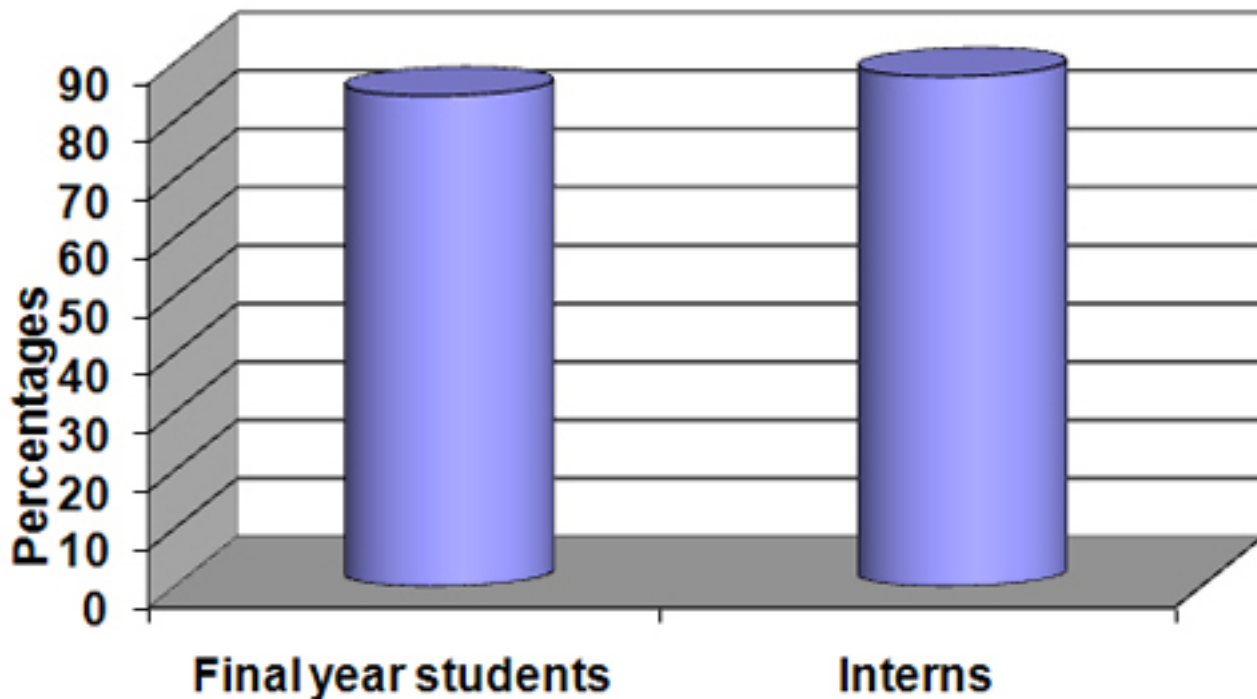
## Methods

This study was conducted in the Department of Anatomy, College of Medicine, King Saud University, Riyadh, Saudi Arabia during the period 2008-2009.

In this study a comprehensive questionnaire in English as well as in Arabic was distributed to the final year students at College of Medicine and interns of King Khalid University Hospital, King Saud University to know their perception about relevance of the dissection course in gross anatomy curriculum that they had experienced in their first year at medical school 5 years earlier and their wish to repeat topographical anatomy during their clinical teaching to enhance their knowledge for everyday practical work in the ward.

The questionnaire was designed in such a way that students and interns could express their point of view regarding time granted for human dissection course done during their pre-clinical tenure and their interest in short, specialized dissection courses during the clinical curriculum. In this study 250 final year students and 150 interns were recruited, however 89% of students and 86.6% of interns responded to the questionnaire, whereas 11 % and 13.4% respectively did not show any interest. Therefore the present study was restricted to 223 (Male=146, female=77) students and 130 interns (Male=78, Female 52).

**Statistical analysis:** The analysis was primarily descriptive in nature and was performed using SPSS version 10.0 program for Windows. Comparison of data was based on the mean percentage to observe the significance of cadaveric dissection amongst interns and final year medical students. In the present study, the numbers of male and female participants were not equal, therefore, the comparison of results between gender groups was not performed.



**Figure 1: Percentages of final year students and interns interested in specialized dissection courses during the clinical curriculum**

## Results

This is a preliminary study to know the students' and interns' perception about relevance of the dissection course in gross anatomy curriculum. They were asked to evaluate the relevance of the dissection course in gross anatomy for clinical training, clerkships, and everyday practical work in the ward. About 80% of final year students and 82% of interns found that sufficient time was spent for the dissection of different regions in anatomy, and a considerable number of students would have liked even more details. The vast majority (Figure 1) expressed a wish to repeat topographical anatomy during their clinical teaching. Furthermore, 84.3% of final year students and 87.6% of interns showed interest in short specialized dissection courses during the clinical curriculum.

## Discussion

Final-year undergraduate medical students and residents were given a questionnaire regarding the gross anatomy curriculum they had experienced in their first year at medical school 5 years earlier. They were asked to evaluate the relevance of the dissection course, in gross anatomy for clinical courses, clerkships, and everyday

practical work on the ward. The vast majority expressed a wish to repeat topographical anatomy during their clinical teaching. Furthermore, on average more than 86% of the students and residents showed interest in short, specialized dissection courses during the clinical curriculum. Our results are in agreement with the results by [7], which suggests that medical students just before graduation, and interns during their practical work in wards, ranked gross anatomy with the dissection course and integrated clinical topics as a keystone for their clinical courses. Anatomists considered dissection to be mainly an instrument for professional training and to help develop professional skills. The technical orientation in any medical education process tends to motivate students towards a purely biological view of the human body [8]. A majority of anatomists felt that the students' attitude and behavior during dissection could be to some extent reflected in future relationships with patients. However, they did not feel that dissection-related attitudes would distinguish the competence of future clinicians [7]. Although several Anatomy Departments have placed a high priority on computerization of the anatomy laboratory we remain strong advocates of the importance

of cadaver dissection. It is our belief that currently, the utilization of computers for dissection is a natural evolution of technology that fosters creative teaching strategies adapted for anatomy laboratories. Development of proper strategies is the need of the hour to significantly enhance the independence and proficiency of students, the efficiency of their dissection time, and the quality of laboratory instruction by the faculty.

Reeves et al [9] show that the need to increase the efficiency of dissection in the gross anatomy laboratory has been the driving force behind the technological changes we have recently implemented. Anatomy learning is generally seen as essential to medicine, and exposure to cadavers is generally seen as essential to anatomy learning around the world [10]. Evidence relating to the effect on medical learning by students not exposed to cadavers is scant. We anticipate that this paper will contribute to an ongoing debate, in which virtually all previous papers on this topic have concluded that use of cadavers is essential to medical learning. Many institutions organize workshops and refresher courses on cadavers in the clinical anatomy of the female pelvic viscera as part of

the training program for the first year residents in Surgery, Gynecology and Obstetrics [11]. The purpose of these courses is to offer a direct experience of practical anatomy. In the practical section, the residents get an opportunity to identify viscera, vessels, and nerves through inspection and palpation, and then a step-by-step dissection is carried out. The course should include presentations on the specimens that illustrate anatomical variability and assess knowledge of topographical anatomy. After the conclusion of such courses Macchi et al [11] reports that for many residents, this is the first practical experience of the anatomy of the female pelvic viscera because the anatomical courses for medical students do not include direct dissection by students. In light of his experience, Robinson et al [12] supports our view and demonstrates that due to a shortage of time for anatomy courses and lack of availability of cadavers some institutions use the fresh tissue dissection of the thorax and abdomen of the rat to teach human anatomy. According to them fresh tissue dissection of the thorax and abdomen of the rat is a valuable tool for human anatomy education. The dissonances in human and rat anatomy enhance abstraction and transfer of knowledge. Active manipulation of organs promotes retention of knowledge, and suturing provides a "clinical" context. Fresh tissue dissection is an efficient innovative method to provide a global review of anatomy of the thorax and abdomen during the busy clinical years of medical education. Many programs replaced dissection with prosections and computer-based learning. We emphasize that cadaver dissection is still necessary for establishing the primacy of the patient, apprehension of the multidimensional body, touch-mediated perception of the cadaver/patient, anatomical variability, and learning the basic language of medicine and competence in diagnostic imaging for the medical specialties. Actual dissection is equally necessary for acquisition of scientific skills and for a communicative, moral, ethical,

and humanistic approach to patient care. This is consistent with the facts by Slizova et al [13] who reports that the knowledge of topographic anatomy is an essential prerequisite for any physician to be successful in their professional career. That is why we pay special attention to topographic dissections when completing the course of normal human anatomy at our department. Johnson [14] suggests that personal dissection vs. peer teaching of the upper and lower extremities revealed subtle effects of dissection on examination performance. Similarly, our results support the idea that hands-on dissection enhances learning and confidence in the subject matter, because examination performance as well as personal satisfaction is enhanced during cadaveric dissection. There is evidence that residents already lose a considerable portion of basic anatomic knowledge in the transition from student to clinician, and this deficit is even more dramatic in residents who start their training with a decreased understanding of anatomy [15]. Cadaveric dissection improves cognitive measures of anatomic perception and is perceived by residents to be a valuable educational approach. Marks [16] believes that patients are three-dimensional (3-D) objects, health care and medical education involve learning and applying 3-D information, therefore we think that opportunities of dissection (visual, tactile, time, discovery, group process, mentoring) contribute to short and long term learning of 3-D information. Dissection offers significant advantages over other methods for learning, confirming, and using 3-D information in anatomy. Jones, [17] raises several questions, about the value of the direct experience of human cadavers. Both objectively and subjectively, a cadaver dissection course is an excellent tool for instructing medical students and residents [18].

Dissection of a human cadaver provides a valuable experience, allowing participants to gain a greater understanding of surgical anatomy and procedures in a no-

risk, unhurried setting. Students and interns who participate in a cadaveric dissection course designed specifically for their needs always show a statistically significant increase in knowledge compared with those without this experience.

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# Point Of Care Literature Review Treatment Of Acute Brucellosis

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## Abstract

**Brucellosis is a zoonotic infection endemic in the Mediterranean Basin, the Middle East, Central Asia, including the Arabian Gulf and parts of Africa and Latin America; it remains a major cause of morbidity in humans.**

**Humans are usually infected through ingestion of raw milk, home-made cheese, or in rural areas through direct contact with infected animals.**

**The best regimen for the treatment of brucellosis has not been clearly determined.**

**This paper discusses the available treatment options and compares evidence based health care resources.**

## Background

Brucellosis is the commonest zoonotic infection world-wide with more than 500,000 new cases annually(1), and considered endemic in the Mediterranean Basin, the Middle East, Central Asia, including Arabian gulf and parts of Africa and Latin America(2,3). It is primarily a contagious disease of domestic animals such as goats, sheep, cows, camels and dogs (4,5).

Humans are usually infected through ingestion of raw milk, home-made cheese, or in rural areas through direct contact with infected animals(6,7).

In Saudi Arabia, it is considered an epidemic disease (8-12), and the infection is mainly due to ingestion of raw milk or its products among the population with a nomadic background(6,7).

Brucellosis remains a major cause of morbidity in humans. Morbidity in humans in the Saudi population continues to be reported with increasing frequency from various regions of the country, particularly

from the rural areas, and human infection is in the range of 1.6%-2.6% (13-15)

The best regimen for the treatment of brucellosis has not been clearly determined(16,17). Although tetracycline-streptomycin combinations had been considered by the World Health Organization (WHO) the standard therapy for years, in 1986 the Food and Agriculture Organization-WHO Expert Committee on Brucellosis changed their recommendations for treatment of adult acute brucellosis to rifampin (600 to 900 mg/day orally) plus doxycycline (200 mg/day orally) for 6 weeks as the regimen of choice(18).

However, the few studies that compared the effectiveness of the doxycycline-rifampin (DR) regimen with the traditional doxycycline-streptomycin (DS) combination had insufficient statistical power and no conclusive evidence(19-23). Moreover, administration of doxycycline and rifampin for shorter periods of time has been associated with a relapse rate of 30 to 40% in other studies(24, 25).

## Clinical Scenario

IFS, A 43-year-old male presented to the Emergency Room (ER) with fever, left shoulder pain, backache and headache. His Brucella Antibodies Titer came to be high, (for Brucella Abortus 1:5120 and Brucella Melitensis 1: 2560).

The ER physician prescribed Doxycycline tablets 100mg twice daily for 6 weeks, and Streptomycin 1gm intramuscular injection daily for 3 weeks, and referred him to the family medicine clinic for follow-up.

The Family Physician reviewed the hospital guidelines for brucellosis treatment and found that the first option is Doxycycline tablets 100mg oral, twice daily and Rifampicin 600-900 mg tablets once daily for 6 weeks.

The Family Physician raised the question, which regimen is supported with the best evidence, with regard to efficacy and tolerability?

### CLINICAL QUESTION

In adult patients presenting with acute brucellosis, is doxycycline-streptomycin regimen more efficacious, more tolerable and with less relapse rates than doxycycline-rifampicin regimen.

### SEARCH STRATEGY

The author did an electronic search for guidelines, recommendations and/or systematic reviews and meta-analyses. He searched Medline (Pubmed clinical queries), Tripdatabases, Curbside MD (Curbside.md), National guidelines clearinghouse (www.guidelines.gov), CDC website, WHO website, Cochrane library, UpToDate and DynaMed databases. The following terms were used: Brucellosis, human, Malta fever, doxycycline, tetracycline, rifampicin, streptomycin, Aminoglycoside, gentamicin, Quinolones, Ofloxacin, Ciprofloxacin, and antibiotics.

The author contacted the Infectious Diseases department at King Abdulaziz Medical City (KAMC) in

Riyadh and obtained the guidelines for Brucellosis used at the institution.

Four Guidelines and recommendations were retrieved which were, National Guideline Clearing House (NGC) and CDC (the same guidelines)(26), Ioannina recommendations(27) and the WHO guidelines(18). The Ioannina is not a typical guideline but is a sort of recommendation, and it is the one implemented at KAMC, two Metaanalyses(1,28), (Kaskly 20081 and Solera 1994). The full text of Solera 1994, is published in Spanish language; only the abstract form is available in English but it is informative and has one expert Report(29) (Tawfeeq 2007)

## Results and Discussion

There is no agreement among the available guidelines, recommendations and systematic reviews on the best regimen for treatment of Brucellosis.

### POINT OF CARE RESOURCES

All the above mentioned resources are point of care resources that support direct patient care. Not all point of care resources are evidence based resources.

DynaMed: The first treatment selection is Tetracycline and Rifampicin 6 weeks(30)

Then it mentioned 4 alternative treatments:  
Tetracycline plus streptomycin or gentamicin  
Chloramphenicol with or without streptomycin  
trimethoprim-sulfamethoxazole with or without gentamicin  
Ciprofloxacin plus rifampicin

DynaMed included an update which is the results from a recent systematic review(1), which concluded that the most effective therapy for brucellosis may be triple therapy (doxycycline plus rifampicin plus an aminoglycoside).

Different regimens had different effectiveness, failure rates and relapse rates.

Monotherapy was less effective than combination therapy. Treatment less than 30 days had higher failure rate than treatment for more than 6 weeks(1).

The failure rate and relapse rate for rifampicin-tetracycline (RT) were 18.8% and 13.9% respectively compared with 8.1% and 4.4% respectively for streptomycin-tetracycline (ST) (Relative Risk = 2.3 and 2.9 respectively) which were highly significant (P= 0.001) and NNH =9 and 10 respectively.

The failure rate of Doxycycline-Streptomycin (DS) regimen was higher than the triple regimen (Doxycycline-Rifampicin-Aminoglycoside); the relative risk was 2.5 (95% CI 1.26-5.0).

Combinations with fluoroquinolone had higher failure rates than other combinations.

There is no clear and explicit recommendation from DynaMed regarding the best treatment regimen.

### UPTODATE

It clearly mentioned the major regimens of the treatment of brucellosis. Regimen A, Doxycycline 6 wks and streptomycin (intramuscular injection) 3 wks/ or gentamicin (intramuscular injection) 7 days and regimen B, Doxycycline and Rifampicin, based on 2 clinical trials(31,32)

There is no statistical difference between Regimen A and B in the effectiveness and relapse rates(32).

The problem with UpToDate recommendation is that, it is based on clinical trials not systematic reviews.

WORLD HEALTH ORGANIZATION/FAO GUIDELINES 1984 Recommended 2 treatment options, either Doxycycline and rifampicin for 6 weeks, or the second option, Tetracycline 6 weeks and streptomycin 2-3 weeks. I was not able to retrieve the full text of this

Source	Recommendations	Last update
DynaMed(1)	<b>Option 1:</b> Triple therapy (Doxycycline-Rifampicin-Aminoglycoside) <b>Option 2:</b> Doxycycline-Streptomycin	Based on systematic review 2008
UpToDate(31,32)	<b>Option 1:</b> Doxycycline-Streptomycin or Gentamycin <b>Option 2 :</b> Doxycycline-Rifampicin	Based on randomized controlled trials (2006 and 1992)
WHO(18) National Guideline clearing house CDC	<b>Option 1:</b> Doxycycline-Rifampicin <b>Option 2:</b> Tetracycline-Rifampicin	Based on the joint FAO/WHO expert committee 1986
Ioannina(33)	<b>Option 1:</b> Doxycycline-Streptomycin <b>Option 2:</b> Doxycycline-Rifampicin	Based on expert recommendations 2007

**Table 1: The available options for treatment of acute brucellosis, their sources and last update**

guideline to know on what basis WHO made its recommendations(18).

**IOANNINA 2007**

This is not a guideline by definition; rather it is an expert consensus recommendation. The first treatment option is Doxycycline 6 weeks and streptomycin 2-3 weeks, the second option is Doxycycline and rifampicin for 6 weeks.(33)

**SUMMARY OF THE GUIDELINES AND RECOMMENDATIONS**

Doxycycline-streptomycin is the first option in UpToDate and Ioannina.

Doxycycline-rifampicin is the first option in WHO, National Guidelines Clearing House and the CDC.

The triple therapy (doxycycline plus rifampicin plus an aminoglycoside) is the most effective treatment according to DynaMed.

**EVIDENCE FOR SYSTEMATIC REVIEWS**

Systematic review (meta-analysis) of randomized controlled trials for therapy is considered level (1) evidence, and when available it has higher recommendation.

A recent systematic review(1) supports the findings of an old systematic review(28)

**FIRST LINE REGIMEN (Recommendation A):**

1. Triple therapy: Doxycycline + Rifampicin + Gentamicin or
  2. Dual Therapy: Doxycycline + Gentamicin
- Dose and duration:  
Doxycycline: 100 mg PO twice daily for 6 weeks  
+ Rifampicin: 600-900 mg PO daily for 6 weeks  
+ Gentamycin: 5mg/kg per day, IM or IV for 2 weeks

In the systematic review(1), two trials compared doxycycline-streptomycin with doxycycline-rifampicin-aminoglycoside. Overall failure was significantly higher with the dual drug regimen (2.50, 1.26 to 5.00, without heterogeneity). Rates of therapeutic failure (3.85, 1.37 to 11.0) and relapse (1.49, 0.55 to 4.0) were also higher with the dual regimen, although the confidence intervals are wide. No adverse events that required discontinuation of treatment occurred in both trials.(1)  
On the other hand, the systematic review compared the Doxycycline-Gentamycin (DG) with Doxycycline-Streptomycin (DS) regimen and found the two regimens (DG and DS) to be equally efficacious (relapse rate 5.2 compared to 7.4 percent in the DG and DS regimens, respectively) (1)

**ALTERNATIVE THERAPY (Recommendation A):**

Doxycycline + Streptomycin  
  
Dose and Duration:  
Doxycycline: 100 mg PO twice daily for 6 weeks  
+ Streptomycin: 1 gram, Intramuscular injections for 2-3 weeks days

The systematic review combined 13 trials, where two regimens were compared; doxycycline-streptomycin was administered for 21 days in eight trial arms and 14-15 days in six, while doxycycline-rifampicin was administered for the duration of treatment, of 30-45 days. Overall failure was significantly higher with doxycycline-rifampicin (relative risk 2.30, (1.65 to 3.21). Adverse events in general and discontinuation because of adverse events were similar for the two treatments. Ototoxicity was reported only in the tetracycline-streptomycin group (six of 262 patients, five trials)(1).

**SECOND LINE REGIMEN (Recommendation B):**

1. Doxycycline 6 weeks+ Rifampicin 6 weeks or
2. Ofloxacin 30 days + Rifampicin 30 days or
3. Tetracycline 6 weeks + Gentamicin or streptomycin 2 weeks

Dose and duration:

Doxycycline: 100 mg twice-daily PO for 6 weeks

Rifampicin: 600-900 mg once daily PO for 6 weeks

Tetracycline: 250 mg Q6 hrs PO for 6 weeks

Ofloxacin: 400mg daily Po for 30 days

Ofloxacin 400 mg/day plus rifampicin 600 mg/day for 30 days compared with doxycycline 200 mg/day plus rifampicin 600 mg/day for 45 days, had similar cure rates in a randomized trial of 29 patients with brucellosis; 5 patients dropped out; 2 patients in each group had clinical relapse but no organisms were isolated, and fever dropped more rapidly with Ofloxacin (mean 74 vs. 106 hours)(34). In another study, there were no significant differences in therapeutic failure of both regimens.(32)

#### REASONS FOR POINT OF CARE RESOURCES INADEQUACIES

1. Why do some clinical practice guidelines recommend Doxycyclin-Rifampicin regimen (non-injection regimen) although it is less effective with more failure and relapse rates?

Convenience with all-oral therapy (doxycycline-refamicin), which can be translated into better adherence and overall success rates, forces the authors to suggest that Docycyclin-Refampicin could be considered as an acceptable first-line(1).

Preference studies(35) summarized the reasons why clinicians and patients prefer Docycycline-Rifampicin, is an all-oral regimen may allow for better implementation in clinical practice in areas with less well-developed health infrastructure, because it eliminates the need for parenteral administration of gentamicin or streptomycin (35).

2. Not all resources are updated, some were published in 1986 while others update the information more frequent (2008)

3. Some resources were opinion (expert) based while others were evidence based.

#### RESOLUTION OF THE CLINICAL SCENARIO

For the 43 year patient with acute brucellosis, the best treatment regimen for him should be the triple therapy (doxycycline-rifampicin-aminoglycoside) which is the most effective therapy with less failure and relapse rates. Patient preference for other regimens will be considered, especially the no-injection regimen like (DR).

The easy accessibility to health care facilities and the willingness of patients to receive injection regimen, all make the first choice for triple therapy.

#### Conclusion

The inadequacies of the point of care resources in the treatment options for acute brucellosis were many; the most recent update was available in DynaMed (the triple therapy). Patient preference should be considered.

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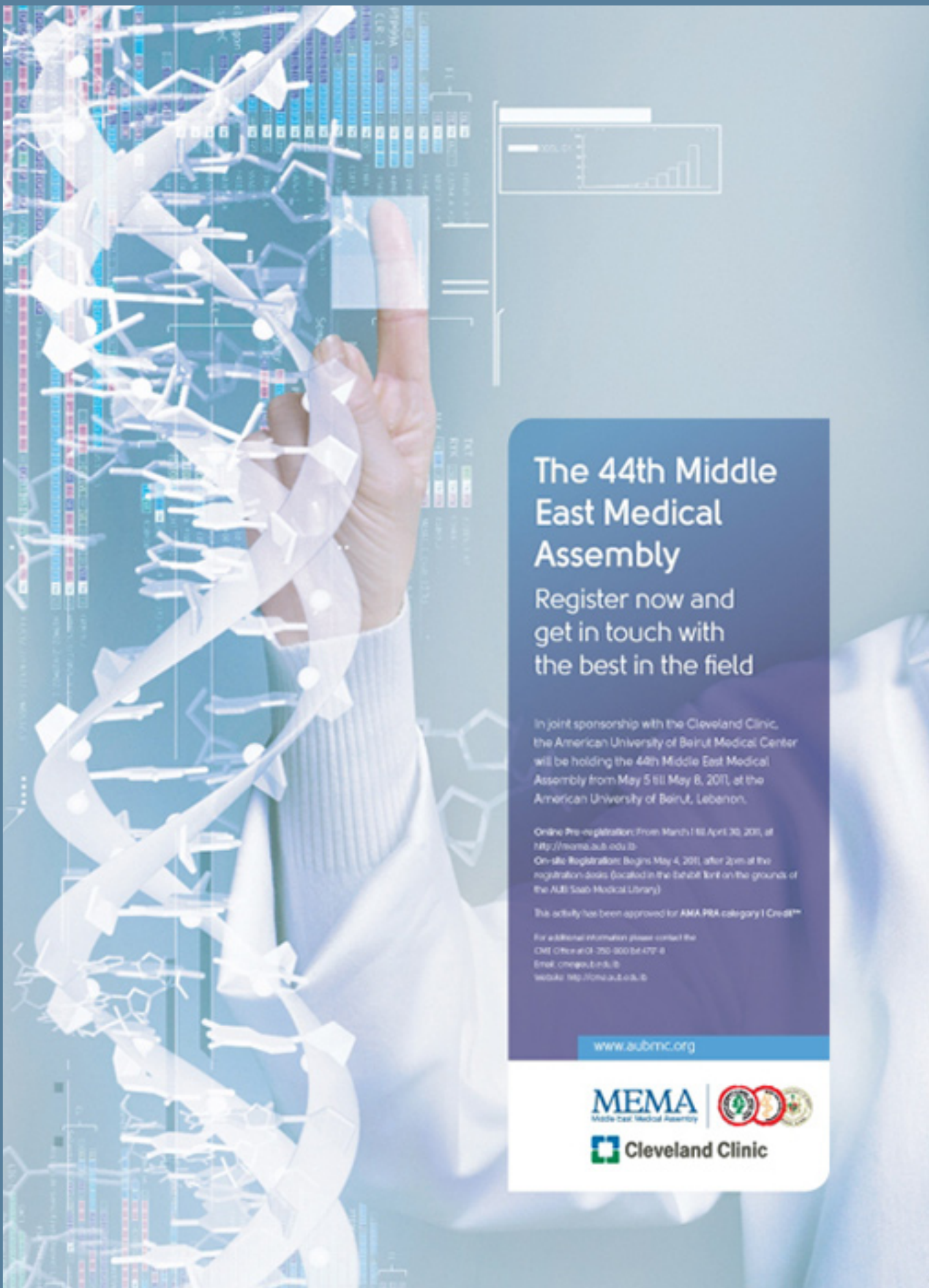
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