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## From the Editor

**Abdulrazak Abyad**  
(Chief Editor)



This is the seventh issue this year, with a number of papers from the region.

We are moving forward and as we have a huge international readership and authors from around the world we are moving toward the World Family Medicine Journal, starting next month

In this issue a cross sectional study from Qatar looked at assessment of patient satisfaction as a way to determine the quality of primary care. The aim of this study was to study the quality of consultation regarding its duration and outcomes in terms of enablement (satisfaction). A total of 189 patients =18 years attended Alwakra and West Bay PHC centers and were selected randomly. The main duration of consultation in this study was (5-10) minutes. About 37% of physician consultations were of duration <5 minutes. The authors concluded that the current data indicates that building established doctor - patient relations is associated with further improvement in the outcome of consultations in terms of enablement effect.

A paper from Amman looked at the Factors that can be attributable to radiation dose reduction in the pediatric age group undergoing brain computed tomography.

The authors stressed that the main aim of all radiological investigations especially in children, is maximum diagnostic benefit and less radiation dose and to achieve that it is worth considering adjustment of pediatric protocols using low radiation dose settings and most recently, modified scanning techniques to avoid

excessive, unnecessary and harmful radiation that investigated children might receive.

A paper from Saudi Arabia looked at the use of prenatal ultrasound in the Al-Hassa area. The study was carried out in 2008 on 2,039 Saudi mothers to describe the routine provision of prenatal ultrasound (PNU) scanning and its variation according to some predictors. Data was collected from mothers within two weeks after delivery, during birth registration. Strict implementation of quality assurance guidelines in all sectors providing prenatal care will decrease the routine use of the third or above PNU.

A cross sectional study from Palestine was performed, at 3 elementary schools in the Bethlehem area to investigate the relationship of load weight ratio, of the school bag , with the lung vital capacity, potential back pain, and postural problems. Tape measurements, weight scale, Spirometer, and a questionnaire were used. The authors found statistically significant correlation was found between extra load weight ratio and less vital capacity, less range of motion in flexion, extension, and left and right lateral bending. PA positive relationship without statistical significance was found between back pain and extra load weight ratio.

A retrospective study from Jordan looked at the frequency of diagnosis of Behcet's Disease in the King Hussein Medical Center. A total of 107 patients were diagnosed with Behcet's disease who fulfilled the International study group criteria for the diagnosis of Behçet's disease. The authors concluded that Behcet's disease is not uncommon in Jordan so we must be more aware of its existence. Male predominance was prominent in patients. Genital ulcer and ocular lesions were the most frequent manifestations. Positivity of pathergy test was not a frequent finding as in other studies done in different world countries.

Sarayrah MA et Habaibeh E looked at whether Pre-Operative Blood Testing in the Pediatric Age Group,

is necessary?. The authors reviewed retrospectively the medical records of 430 children who presented for elective minor surgical procedures in the division of pediatric surgery. Pre-operative investigations (complete blood count, urea and electrolytes) were analyzed in the form of frequency of abnormalities, and the effect of the abnormal results on the procedure. The relationship between the complications and the abnormal results was also examined. The authors concluded that these results indicate that pre-operative blood testing in the pediatric age group undergoing elective minor surgical procedures has very limited value in patient management. It may be unpleasant for the patient and the parents. A detailed history and clinical examination are of greater value than routine laboratory test in determining a child's fitness for surgery.

A descriptive study from Iran looked at the Psycho-Social Factors on People's Tendency to Sexual Change in the City of Tehran. The authors' aimed to identify the differences between the roles of men and women (the expected role) and what they actually do (the adopted role). The findings of the study indicate that there is a significant relationship between transsexuality and the variables such as life expectancy, the absence of parents, family support, job status, income, charges from society, respecting tradition, family satisfaction, education, respecting religious belief, lack of any kind of legal rule, and the functions of governmental institutions. The authors concluded that transsexuals suffer from gender identity disorders, and some psycho-social factors influence their private lives and also social environment. Further research about transsexuality would be beneficial for their adjustment in the society.

# Assessment of Enablement Effect of Consultation on Patients Attending Primary Health Centers in Qatar 2008

## ABSTRACT

**Introduction:** Assessment of patient satisfaction is a way to determine the quality of primary care. The outcomes of consultations include patient satisfaction, recall of the physician's explanations and changes in the patients' concern about their symptoms. The aim of this study was to study the quality of consultation regarding its duration and outcomes in terms of enablement (satisfaction).

**Subject and Methods:** A cross-sectional analytic study was carried out over a three months period from January to March 2008, on 189 patients =18 years who attended Alwakra and West Bay PHC centers and who were selected randomly. They were exposed to a pre-consultation questionnaire including questions about some sociodemographic variables, the type of patient problem (acute or chronic), the cause of visit, patient's ability to choose their consulting physician and previous physician - patient relationship. Doctors completed another questionnaire including the duration of the consultation and whether the consultation was new or was for follow up. After the consultation, the patient completed "the patient enablement instrument".

**Results:** The main duration of a consultation in this study was (5-10) minutes. About 37% of physician consultations were of duration <5 minutes. The mean enablement score in this study was (7.57). 63% of patients showed a good enablement score (>60%). The study showed that the mean enablement score increased in association with the ability of patients to choose their physician and with increasing the duration of consultation ( $P<0.05$ ).

**Conclusion:** The current data indicates that building an established doctor - patient relationship is associated with more improvement in the outcome of consultation in terms of enablement effect.

**Keywords:** consultation - enablement effect - PHC.

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## Introduction

Assessment of patient satisfaction is one way to determine the quality of primary care, although it is dependent on the service that patients utilize and the subjectivity of their opinions. Patient satisfaction questionnaires can be used as a useful tool to evaluate the performance of health care providers during consultations<sup>1</sup>. Consultation is considered to imply a meeting face to face, between patient and doctor. The standard medical model of the consultation, which follows history taking, examination, diagnosis, and treatment is lacking what is happening in the process of communication between physician and patient<sup>2</sup>. *Palmer (1997)*<sup>3</sup> said that measures of consultation outcome are imperfect. It is extremely difficult to measure the average health, medical knowledge or prognosis of a doctor's list and to relate it to variations in consultative approach. Three important outcomes that can be counted are patient satisfaction, patient improvement and patient compliance. When the consultation is judged according to these criteria it is clear that the outcome could be maximized. Various techniques can be employed to improve such outcomes as diagnostic accuracy, patient satisfaction, communication and compliance. A good relationship, and expectation, keeping the message simple and clear, repeating the message and stressing its importance will lead to enhancement of patient compliance

and satisfaction. Different studies were conducted worldwide on the effect and quality of care in the general practice consultation. *Howie et al, 2000*<sup>4</sup> conducted a study to determine the relationship between quality of consultation and some variables. The author found that the mean duration of a consultation increased when the consultation had a psychological component. Patients aged over 65 had high enablement and long consultations. Consultations for women lasted longer than those for men. Patients with social problems alone had the lowest enablement score; the more problems a patient wanted to discuss, the longer the consultation and the greater the enablement. Good doctor-patient relationships will result in considerably increased enablement effect<sup>5</sup>. So such a study is greatly required in our practice to assess the quality of care. This study was conducted to measure quality of consultation among patients attending PHC centers in Doha, and to determine the factors affecting the quality and outcome of these consultations.

## Methods

Sample size determination was conducted by Epi-info calculator, and was calculated to be 189 subjects, after considering a 10% dropout. The subjects of the study were all patients equal or more than 18 years old attending 2 randomly selected primary health centers in Qatar, one urban

and one semi-urban (95 patients from each center) by systematic randomisation (every third patient was included in the sample). Each eligible patient was exposed to a pre-coded questionnaire in a structured interview before consulting their physician to collect data about socio-demographic variables, the type of patient problem (acute or chronic), the cause of visit, their ability to choose their consulting physician and previous physician - patient relationship. Doctors completed another questionnaire including the duration of the consultation and whether the consultation was new or it was for follow up. After the consultation, the patient was exposed to another questionnaire to measure the enablement effect of this consultation. It contained 6 questions about ability of the patient to understand his/her illness, dealing with the illness and how they can maintain their health. These questions scored as 2 for much better, 1 better, 0 same or less. A good score was considered as >60% of the total score (8 out of 12). Each physician included in this study was exposed to a physician questionnaire to collect data regarding duration and type of consultation and reason for visit. The patient's pre-consultation information was hidden from the doctor. Collection of data was over a period of three months from January to March 2008. Patients enrolled in the study had to sign a special consent form which was approved by the Research committee of HMC. Data were analyzed using the SPSS for Windows version 16 software program. Frequency tables and descriptive statistics were done. Significance test used included confidence intervals, odds ratio and chi square test. Frequency rates were compared to available data on national averages and trends. The value of p was considered significant if less than 0.05.

### Ethical considerations

Approval of the research as well as the national ethical committee was gained. Informed consent was signed by participants after explanation of purpose of the study, the direct and indirect benefits and risks, as well as

confidentiality of collected data with their right to withdraw at any stage of the study.

## Results

More than three quarters of the studied population were aged 45 years (77.06%), 73.3% of them were female. It was found that 82.4% of the studied population attending family practice centers had acute illnesses and 17.6% had chronic illnesses. An important finding was that the consultation time was = 5 minutes for 68% of the studied population and 21.8 % of them had consultation time > 10 minutes with mean duration of 6.69 minutes. Almost two thirds of the studied population (63%) showed a good enablement score (> 60% or more than 8 out of 12) as shown in (Figure1). The current study showed that all items of the enablement questionnaire demonstrated statistical significant difference individually and collectively. The mean enablement score was (7.54) as shown (Table 1). Only the ability to choose the physician and the consultation time, were statistical significant variables in relation to good and poor enablement scores as shown in (Table 2). The regression analysis was made between some variables and the enablement score. The result illustrates that there was a positive and significant correlation between age, social score, established Doctor-Patient Relationship (DPR) and choosing of their physician on one hand and enablement on the other hand ( $P < 0.05$ ) as shown in (Table 3).

## Discussion

Patient satisfaction is a strong measure in the evaluation of quality of care because it reflects the experiences of those who receive the care. Although positive feelings towards doctors can be affected by factors such as the personality of the doctor, the ability of the doctor to reassure, the nature of the patient's disease and characteristics of the patient<sup>1</sup>. In the present study, the majority of the attending patients presented with acute illnesses (82.4%) compared to (17.6%) of patients with chronic illnesses. These

results were different to a study conducted in Britain and showed that 45.2% of patients reported acute illnesses, 42.1% reported chronic illnesses and 8.4% of patients sought general health advice<sup>5</sup>. The mean duration of consultation in the current study was (6.69) minutes. These results were partially in agreement with many reported results of a group of studies in western countries which concluded that the mean duration of consultation time ranged between 2 and 21 minutes<sup>6-11</sup>. The variation among the results of the present and the above mentioned studies could be explained by the differences among different family practice settings regarding the flow rate and the existence of appointment systems that ensure adequate time for consultation. Also, the family physician may behave in different ways according to the nature of sessions, as counseling sessions, for example, may need more time. This view was supported by *Freeman (2001)*<sup>11</sup>. In the present study it was shown that the mean enablement score was 7.54. This result differed with *Howie et al (1999)*<sup>5</sup> who reported that the mean enablement score was 4.5. It was found that, enablement score showed no significant difference in relation to some socio-demographic variables such as age (increasing enablement score with increasing age), sex ( $p > 0.05$ ). These results disagreed with *Kotic (2001)*<sup>12</sup> who demonstrated that patient satisfaction had a positive correlation with age, sex and educational level. *Baker (1995)*<sup>13</sup> in a study conducted in the UK found that the duration of consultation and patient enablement were affected by sex, age and number of problems discussed. The result of the present study confirmed that there was a positive correlation between duration of consultation and enablement score ( $p < 0.05$ ). These results were supported by other studies<sup>5,15,16</sup>. *Campbell (2001)*<sup>17</sup> found a significant positive correlation between duration of consultation and the enablement score. *Goedhuys (2001)*<sup>15</sup> in his study conducted in Belgium found that there was a positive correlation also between duration of consultation and patient satisfaction and *Freeman*

*et al*<sup>11</sup> found that 12% of patients complained of having insufficient time with their general practitioner, but this figure became 30% when the patient was consulted for five minutes or less. *Howie et al (1999)*<sup>5</sup> concluded that for individual consultations, the enablement score was most closely correlated with duration of consultation. In the present study it was shown that 65.1% of patients who attended family practice centers had established doctor-patient relationships. We have found a positive correlation between the enablement score and both of the established doctor-patient relationships and the patient ability to choose his physician ( $P < 0.05$ ). These results were in agreement with many other studies such as *Howie et al (1999)*<sup>5</sup>, *Baker (2003)*<sup>18</sup>, *Hjortahl, (1999)*<sup>19</sup> and *Little et al. (2001)*<sup>20</sup>. A study conducted in the Netherlands found that the doctor patient relationship has a positive correlation with satisfaction and compliance<sup>21</sup>.

## Conclusion

This study indicates that building an established doctor patient relationship and giving more time for consultation are prerequisites for improvement in the outcome of consultation in terms of enablement effect.

## Acknowledgement

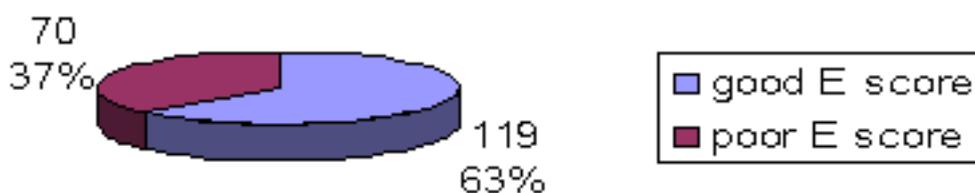
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APPENDIX: Figure (1)

## Average Enablement score



**Table 1** Consultation enablement items

items	Ranking				Mean	SD	T test	P value
	Much better (2)	Better (1)	Sum	Same or less (0)				
1. Able to cope with life	96 (50.8%)	82 (43.4%)	178 (94.2%)	11 (5.8%)	1.45	0.6	32.95	0.00
2. Able to understand your illness	90 (47.6%)	78 (41.3%)	168 (88.9%)	21 (11.1%)	1.37	0.68	27.78	0.00
3. Able to cope with your illness	63 (33.3%)	103 (54.5%)	166 (87.8%)	23 (12.2%)	1.21	0.64	25.9	0.00
4. Able to keep yourself healthy	61 (32.3%)	95 (50.3%)	156 (82.6%)	33 (17.4%)	1.15	0.69	22.83	0.00
5. Confident about your health	64 (33.9%)	94 (49.7%)	158 (83.6%)	31 (16.4%)	1.18	0.69	23.44	0.00
6. Able to help your health	62 (32.8%)	99 (52.4%)	161 (85.2%)	28 (14.8%)	1.18	0.67	24.28	0.00

$X^2$  for the shaded columns = 39.7  
 $P = 00000$

**Table 2** Relation between enablement score and different variables

Variable	Good E score	Poor E score	X2	P value
Sex				
Male	45	25	0.08	0.89
Female	74	45		
Age				
<20 y	16	16	4.64	0.2
20-40 y	61	31		
>40-60 y	42	22		
>60 y	0	1		
Type of problem				
Acute	67	35	0.7	0.4
Chronic	52	35		
Cause of the visit				
General health advice	32	21	0.66	0.7
Prescription	61	37		
Follow up	26	12		
Familiarity with the physician				
Yes	68	32	2.3	0.12
No	51	38		
Ability to choose physician				
Yes	60	25	3.83	0.05*
No	59	45		
Period of consultation				
< 5 min	48	22	8.4	0.015*
5-10 min	53	27		
> 10 min	18	21		
Illness type				
New	59	36	0.06	0.8
Recurrent	60	34		

\* Significant statistical difference

**Table 3** Regression analysis of some variables of relevance to enablement effect of consultation

Variable	Mean	Regression Coefficient	Std. error	t test	P value
Age	2.18	0.319	0.276	1.33	
Gender	1.63	-0.253	0.425	0.35	
Type of the problem	1.46	-0.512	0.436	1.38	
Cause of visit	1.92	-0.287	0.296	0.94	
Familiarity with physician	1.47	-0.018	0.559	0.00	
Ability to choose of physician	1.55	0.064	0.552	1.33	
Consultation time	1.9	-0.196	0.231	0.73	
Acute or recurrent problem	1.5	-0.314	0.436	0.52	

# The Effect of School Bag Weight on Pain, Posture, and Vital Capacity of the Lungs of Three Elementary Schools in Bethlehem District in Palestine

## ABSTRACT

A cross sectional study was performed, at 3 elementary schools in Bethlehem area in Palestine to investigate the relationship of load weight ratio, of the school bag, with the lung vital capacity, potential back pain, and postural problems. Tape measurements, weight scale, Spirometer, and a questionnaire were used. 100 randomly selected students were recruited for this study.

Statistically significant correlation was found between extra load weight ratio and less vital capacity less range of motion in flexion, extension, and left and right lateral bending. A positive relationship, without statistical significance, was found between back pain and extra load weight ratio.

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## Introduction

Back pain in children appears to be more common than was previously thought. Studies have indicated that 10%-30% of healthy children experience back pain, especially low-back pain, by their teenage years. About 2% of these children experience symptoms severe enough to prompt a visit to the doctor, however, most of the children simply trudge through the mild pain with little complaint or disability (*Weir, 2002*). Spinal pain in young people is a significant source of morbidity in industrialized countries. The carriage of posterior loads by young people has been linked with spinal pain, and the amount of postural change produced by load carriage has been used as a measure of the potential to cause tissue damage (*Steel et al 2003*).

Young children are suffering from back pain much earlier than previous generations, and the use of weighty backpacks is a contributing factor. Heavy packs can cause a child to hyperextend, or arch, his or her back, or lean the head and trunk forward to compensate for the weight of the bag. These postures can stress the muscles in the neck and back, increasing the risk of injury and fatigue. The natural curves in the middle and lower back can become distorted, which can cause irritation to the spine joints and the rib cage. A rounding of the shoulders could also result if a back has to compensate for a heavy load (*American Chiropractic Association, 2008*).

The American Academy of Physical Medicine and Rehabilitation found that students carrying backpacks weighing 25 percent of their body

weight had balance problems and were unable to perform normal activities such as climbing stairs and opening doors. Conversely, students who wore backpacks weighing 15 percent of their body weight maintained balance moderately. The most effective weight carried in the packs, however, was five percent of body weight (American Academy of Physical Medicine and Rehabilitation, 2008).

(*Shasmin h., et al, 2000*)<sup>1</sup>

Investigated in his study the changes in Ground Reaction Forces, GRFs and trunk inclination among primary students when carrying heavy backpacks. The vertical GRF increased almost three times when loads increased up to 20% of body weight compared to 10% of body weight. The anterior-posterior GRFs were asymmetrical when loads were increased. When carrying load of 15% of body weight, the subjects adopted a compensatory trunk inclination. Ground Reaction Forces and trunk inclination are important as the criteria to determine the acceptable backpack loads for children.

According to *Weir (2002)*, 80% of the children felt their backpack was heavy at least "sometimes"; 65.7% reported that carrying a backpack made them tired and 46.1% felt that it caused them back pain. In addition it was also found that Children who reported "feeling fatigued" while carrying the backpack and those who carried the pack for longer periods of time experienced significantly more back pain. However, backpack weight was not significantly associated with back pain.

(*Angela G (2007)*)<sup>4</sup> found in her

study about evaluating the impact of educating adolescents in practical ways of looking after their backs to reduce the incidence of back-pain, with particular focus on the use and carrying method of ergonomically designed schoolbags, that education had an immediate positive impact on students' awareness of the importance of looking after their backs, and achieving positive back-health. Information gained was likely to influence future choice of schoolbag type, and intention to change to more back-health aware schoolbook and equipment carrying behaviours.

(Negrini *s. et al* 2007)<sup>5</sup> observed that the postural response to the asymmetrical load (8 kg ASYM) was a retro positioning (4 mm) and an elevation (2.5 cm) of the loaded shoulder together with a lateral deviation of the trunk (3 cm) away from the load. The results were the same regardless of which shoulder was used (right or left). No statistical significance was reached in the 'left shoulder' subgroup because of the small number of subjects it contained.

(Alice *j. et al* 2001)<sup>6</sup> demonstrated a restrictive effect on lung volumes when a school-bag load is heavier than 10% of a child's body weight. His results also confirm the detrimental effect of a kyphotic posture on pulmonary mechanics and the necessity for health-care professionals to advocate proper postural advice to school children, teachers and parents.

(Mohan *m. et al* 2007)<sup>7</sup> revealed that both backpack weight and time carried influenced cervical and shoulder posture. Carrying a backpack weighing 10% of body weight appeared to be too heavy to maintain standing posture for adolescents. These findings have implications for future load carrying studies in adolescents.

The prevalence of postural problems usually had roots in early childhood and adolescence, starting from the first decade of the student's life, and one of the most apparent causes could be the overload and the carrying habits of the students'

bags. And with little if any national studies targeting this issue, this research participates in adding to the body of knowledge about this particular potential cause of postural deformities.

### Study objective

The main objectives of this study was to

1. Identify the prevalence of Back Pain and postural problems among elementary school pupils.
2. Determine the relationship between carrying a heavy school bag, the existence of postural problems, and back pain.
3. To investigate the relationship between the student weight bag ratio and the Lung vital capacity.
4. Investigation of carrying habits and their relationship to particular postural problems.
5. Identify the relative relationship between the pupil's weight and the bag load.

### Methodology

A cross sectional observational study, was performed in the late study year of 2008 in 3 governmental elementary schools in Bethlehem district in Palestine, on students aged 6-16 years. From the three schools, 100 students were randomly selected for participation in this study.

### Tools of data collection

Weight scale, Questionnaire, Spirometer, and a Tape measure

### Procedure

Each participant was subjected to a questionnaire with the help of the researcher, and then observational postural assessment was performed in relation to protraction, retraction, shoulder depression, and kyphosis. Range of motion was also tested in terms of lumbar flexion, side flexion to both right and left, the load of the bag was recorded and the weight of the child was taken, and a new product called load/weight ratio was calculated (LWR), by dividing the load of the bag by the load of the child.

### Ethical considerations

An explanation of the research was

given to the students, including the aims and benefits of the research. Anonymity was guaranteed and the right of withdrawal for any participant at any stage was explained. Assurance was given that the information and data would not be used for any purpose other than the aims of this scientific research

### Statistical analysis

Data was entered onto the computer using SPSS version 16. Descriptive statistics of mode, mean, and percentages were derived. Person correlation was calculated for ratio variables, like ROM, weight, pyrometer, and LWR. Spearman correlation was calculated for ordinal data, to assess the correlation of increased LWR, with pain, postural problems, and Lung vital capacity.

### Study variables

1. Spine contour, back pain, Postural assessment (kyphosis, scoliosis, protracted shoulder girdle, excessive hyper extension, shoulder depression, postural assessment while holding the bag, load - weight ratio: the division of the bag load over the body's weight), anthropometric variables (length, weight), the habit of sport playing, the existence of high cushion, the existence of a firm mat, the performance of related physical activity after school (if there is a regular physical work and what it is), the carrying habit (on back, on one shoulder, side right/left, carrying hand right/left, the duration of carrying time (the time between the school and house)\*.
2. Lung function capacity (maximum inspiration, followed by maximum expiration) with and without bag holding, lumbar range of motion (flexion, extension, Rt. Side flexion, and Lt. side flexion).

### Results

Around 30% of sample participating were female and 72% were males. With students from the first Class to the tenth class with the mode being the 10th class (17%). The average load weight ratio was 0.09, the average weight of the sample was

41.9, with average height of 148.5. The students were carrying as back load an average of 3.51; average age was 12.27.

Load weight ratio, which is shown in Figure 1 shows the distribution of weight load ratio among the sample, with 41% of the sample showing either overloaded or severely overloaded, in relation to their weights.

Carrying mode was back carrying (67%), 25% were carrying the bag on the right shoulder and the rest were using the left shoulder for carrying.

Pain was found to be positive among 48% of the students with only 13% showing moderate to severe pain and the other 35% complaining of mild pain (Figure 2). Among those 48% who complained of pain, 37% reported this pain to be either in the lumbar or in the thoracic spine. The rest were either cervical or Sacro Iliac pain. This pain was reported to be always or frequently there (18) and often there among (30%) (Fig 3), (Fig 5).

Postural kyphosis was found to be prevalent among 29%, showing either slight or moderate kyphosis. No severe kyphosis was found among the sample (Fig.4). Scoliosis was seen in 5% of the students and 25% showed slight to moderate Right shoulder depression. Slight to moderate Lt. shoulder depression was found among 29% of the sample. Slight to moderate protraction was found to be among 10% of the students, which is usually a common postural manifestation in coexistence of kyphosis.

Slight Shoulder retraction was seen among 30% to the right, and 21 to the left. Muscle counter imbalance was prevalent among 18% of the students, with 10% having increased muscle counter to the Rt. And 8% to the left.

Lung vital capacity was measured using a Spirometer, with and without bag carrying. Its average was 288.25, with bag carrying, and without bag its average was 297.25.

Back range of motion was measured using a tape measure. Back flexion as the main decreased

ROM manifestation was prevalent 57%, with mean flexion of (12.1 cm), which in this case we cannot be sure that this was due to lumbar muscle spasm or shortening of the hamstrings, but it shows within this context a lack of muscle length and fitness among a group which is supposed to be in a highly mobile age category (Table 4.2). It was measured by tape measure and its mean was -

## Analysis & Discussion

### 1 Load weight ratio and sex

There was a very strong statistical significant difference between female gender and the fact of over load, Mann Whitney U =399.500 p < 0.00. We notice from the table that more than 78% of participating females, had the category of either over load, or very severe load, compared to 26.4% of males falling in the same category, which may impose a question about what other material the female students might have in their bags, that could be playing a role in giving such a difference in load carrying among the sample participants.

### 2. Load weight ratio and class

We can see from the Chart (Fig 7) that the majority of over load and severe over load lies in the categories of class between 1- 6, as we know this is a very important period of a child's physical development, the issue that should be taken into consideration so that it does not affect the student's future posture, when they come to the adolescence, that a strong statistical significant correlation was found between this category and having over load with spearman r = 0.785 p < 0.01.

### 3. Carrying side and LWR

Statistical significant correlation was found between carrying side and over load with spearman r = 0.445 P < 0.01, as students with more load tend to adopt back carrying so that they can cope with the over load, and this type of carrying has more effect on kyphotic posture to compensate the load (Table 3).

## 4 Vital capacity changes

The sum of the aspiratory capacity with the expiratory reserve volume, and the Vital capacity is measured by a maximum inspiration followed by a maximum expiration.

Comparing the mean of vital capacity with and without load, we saw that there was a statistically significant difference between the mean VC with load, and the mean VC without load t = 5.624 p < 0.001. There was a strong negative coloration between more LWR and the decrease in vital capacity with person r = - 0.707 p < 0.01, which is usually what we see with some respiratory diseases like emphysema, asthma and chronic bronchitis.

### Back ROM and load weigh ratio

A positive correlation between the LWR and the score in back flexion has been found, which in fact clinically means the opposite, as with less distance in flexion test we know that we have more range of motion, and this indicates that with more load weight ratio, we have less back flexion. Pearson = 0.221 p < 0.05. There also has been a stronger relation between the severity of limitation of back flexion and the increase in LWR, (Pearson = 0.269 P < 0.01) which gives better prediction of the consequences of further load of the bag on the future health of the students. A negative statistically significant correlation was found between the playing of sport and the ROM score, (P = -0.274 P < 0.05), which again clinically means more range of motion and this shows the preventive role of exercise. And its role in helping in better range performance.

In back extension there was also negative correlation between increased LWR, and back extension. The strong negative statistically significant correlation could be justified by the tendency of the students to be in a flexion position to compensate the load, which probably has contributed to less extension ROM Pearson = - 0.508 p < .01. Both lateral bending sides were found to have a negative relation with load weight ratio, as we know that in

such activities, movements come in combination rather than in one plane of movement, and as we saw earlier the effect on decreased ROM in extension and flexion was translated into the negative relationship with lateral bending too with Pearson correlation of 0.444, and -0.491 for right and left lateral bending respectively at  $p < 0.01$ .

No significant correlation was found between load weight ratio and muscle imbalance. Positive Correlation without statistical significance was between carrying the bag at the right side and the existence of right muscle contour imbalance.

## Discussion

From the previous analysis we would like to mention that the load weight ratio has a positive relationship without statistical significance, with many factors like, pain, pain location, kyphosis, and other variables.

And a strong statistically significant correlation, was found between LWR and the following important variables.

### Summary of statistically significant correlations with load weight ratio

Also it is important to mention that a statistically significant negative correlation was found between playing sport and the increased

range of spinal flexion with Pearson  $\rho = -0.247$   $p < 0.0$ , which means that with more sports the score of back flexion test was less, which clinically means increased range of motion, which highlights the importance of sports in maintaining a healthy mobile spine.

## Recommendations

Based on the previous results the researchers recommend the following

1. Taking the load of the school bag into consideration by the teachers, schools directors, and the ministry of education, in a way that does not allow the load to exceed the percentage of 0.09 of the student's weight.
2. To reaction to the load of back especially in the first 6 elementary classes, as a category that has shown the biggest peak of the sample.
3. Either dividing the material into 3-4 parts that allows less weight when the students are travelling to the school, or maybe leaving some text books at the class itself.
4. Stressing the importance of a daily regimen of exercises at the beginning of every school day, as a part of preventive measures, that would help the student in achieving better posture, and mobility.

5. Adding the morning stretching exercises, with deep breathing as part of the morning regimen, to help the students in reaching the maximum respiratory vital capacity.
6. The application of this research with modern computerized models of assessment, and on a greater sample, and the importance of application of other assessments of range of motion, to exclude interference in back ROM scores.

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Table 1: Descriptive statistics of the sample

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
age	100	6	17	12.27	3.087
weight	100	21.0	94.0	41.901	16.0778
bag Load	100	2.0	6.0	3.518	.9377
Height in CM	100	114	189	148.53	19.265

Table 2 Mean Range of back motion

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid normal <0-0.05	19	19.0	19.0	19.0
mild 0.06-0.10	7	7.0	7.0	26.0
moderate 0.11-0.15	17	17.0	17.0	43.0
sever 0.16-0.20	26	26.0	26.0	69.0
very sever 0.21 and above	31	31.0	31.0	100.0
Total	100	100.0	100.0	

## Load weight ratio and sex

		LWR.Cat				Total
		normal. 01 - 0.05	moderate. 06 - 0.09	over load 0.10- 0.15	very severe over load 0.16 and above	
sex male	Count	23	30	16	3	72
	% within sex	31.9%	41.7%	22.2%	4.2%	100.0%
female	Count	0	6	18	4	28
	% within sex	.0%	21.4%	64.3%	14.3%	100.0%
Total	Count	23	36	34	7	100
	% within sex	23.0%	36.0%	34.0%	7.0%	100.0%

Figure 1 load weight ratio category

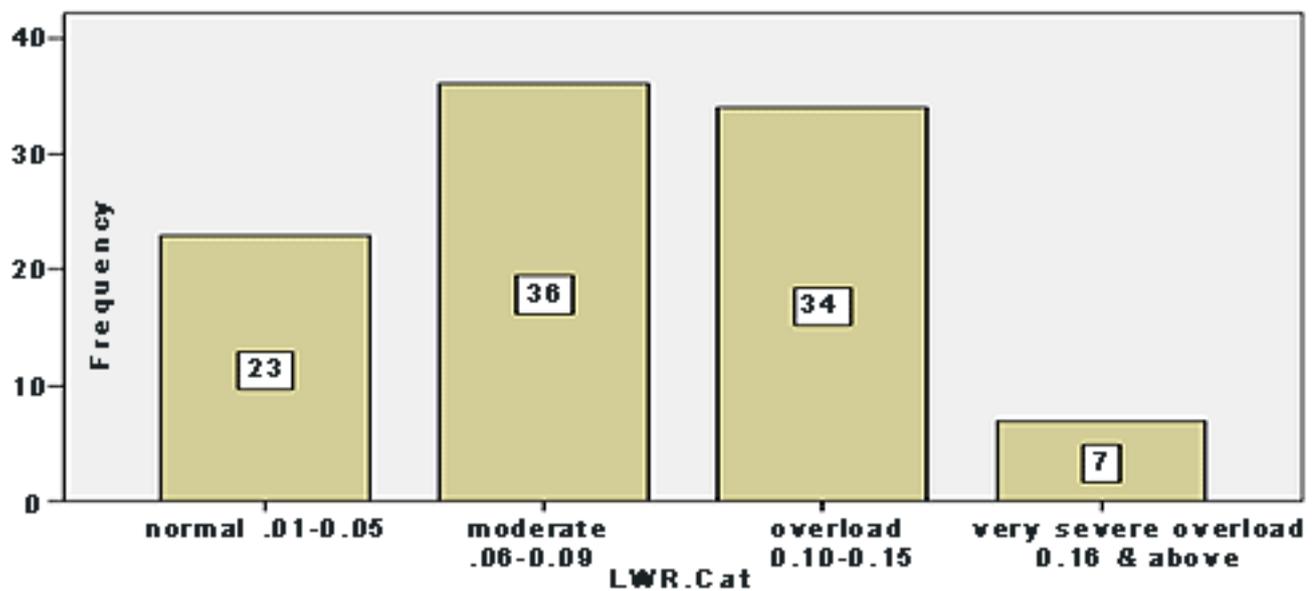


Figure 2 Existence of pain

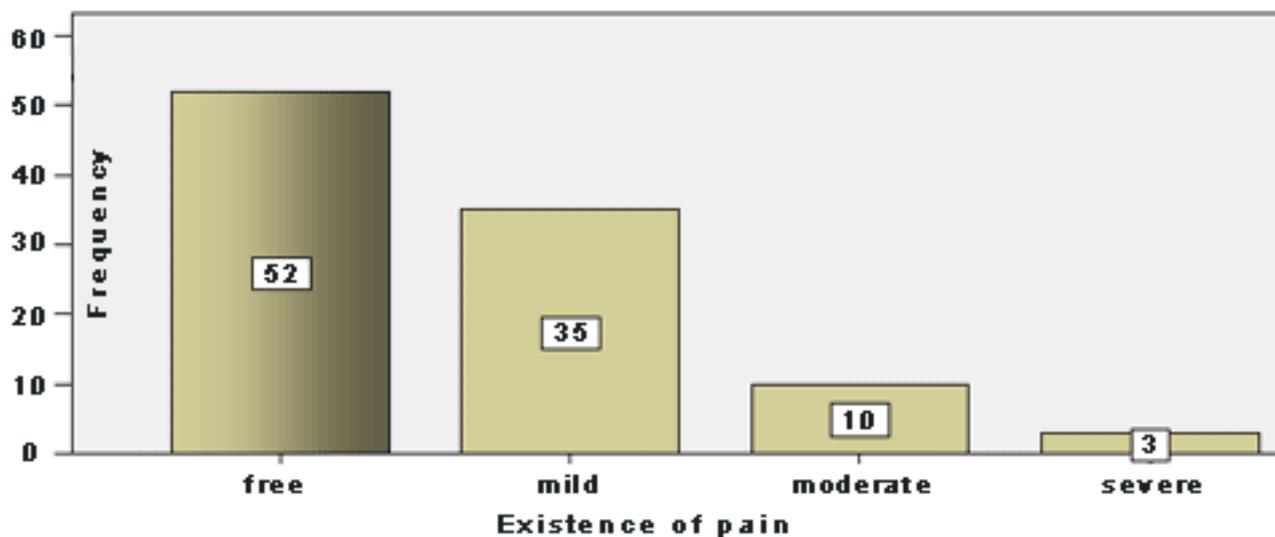


Figure 3 pain frequency

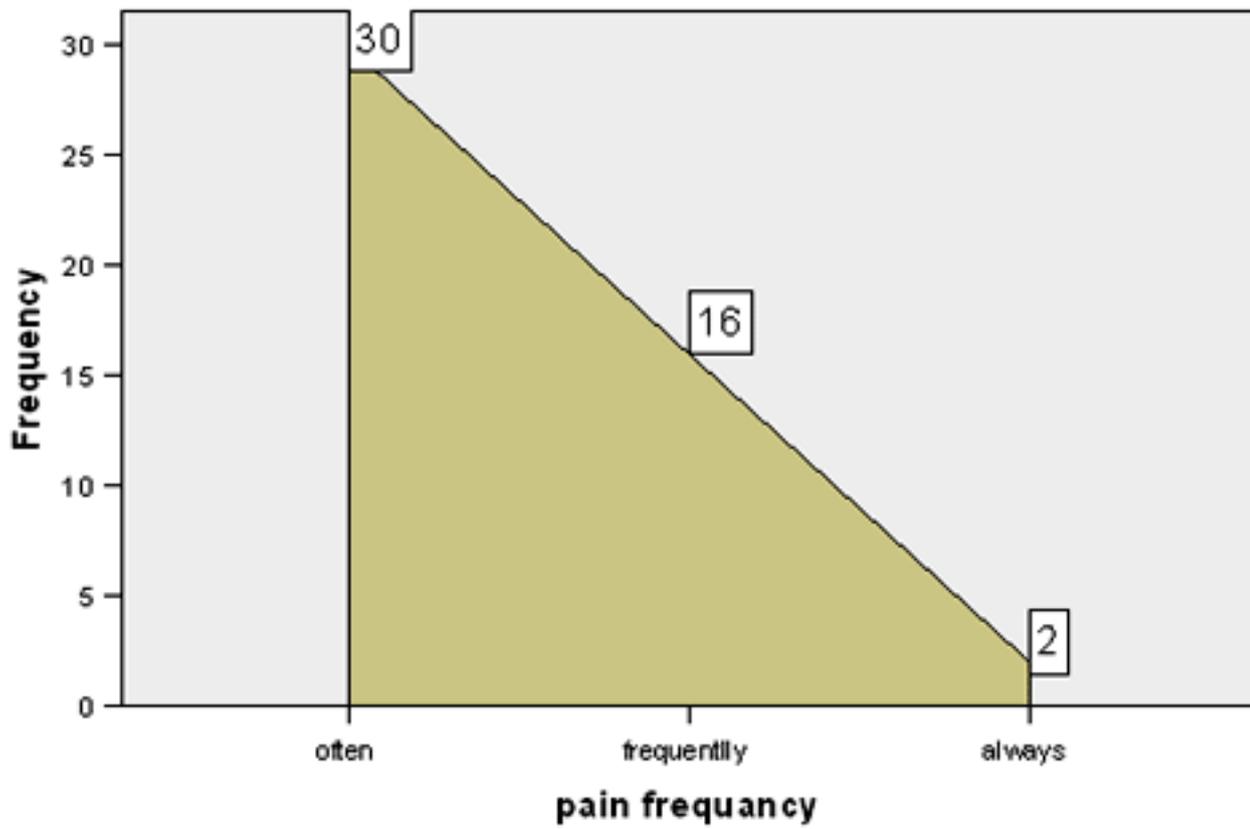


Figure 4 kyphosis

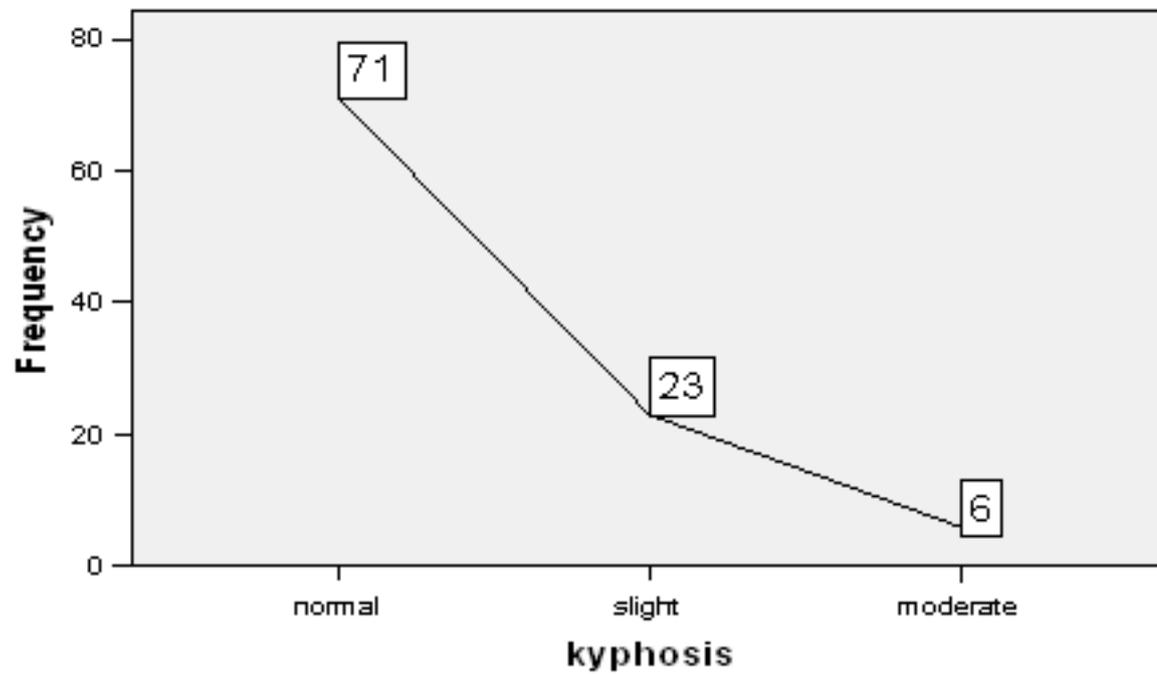


Figure 5 Students' lung vital capacity with and without load

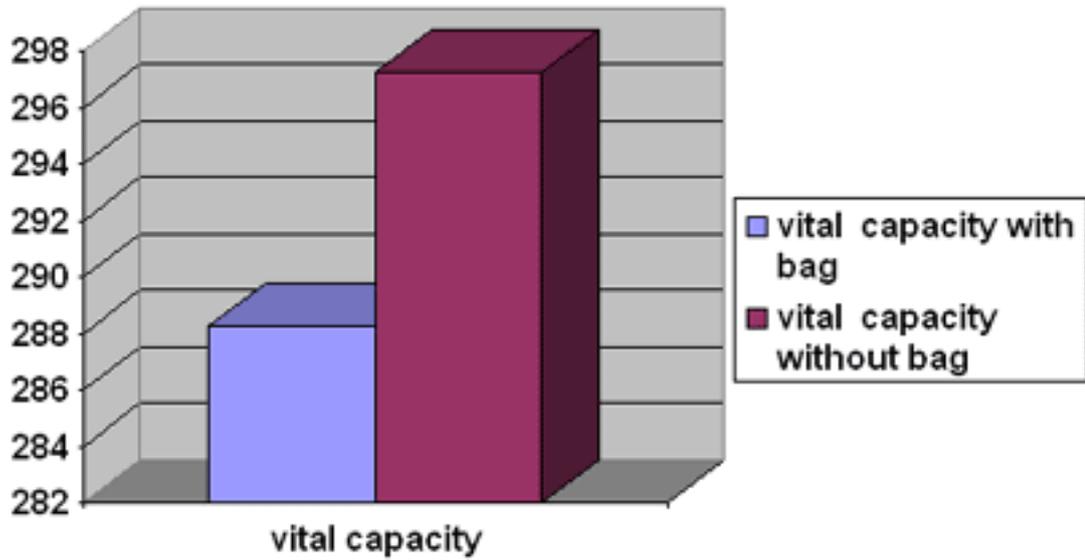
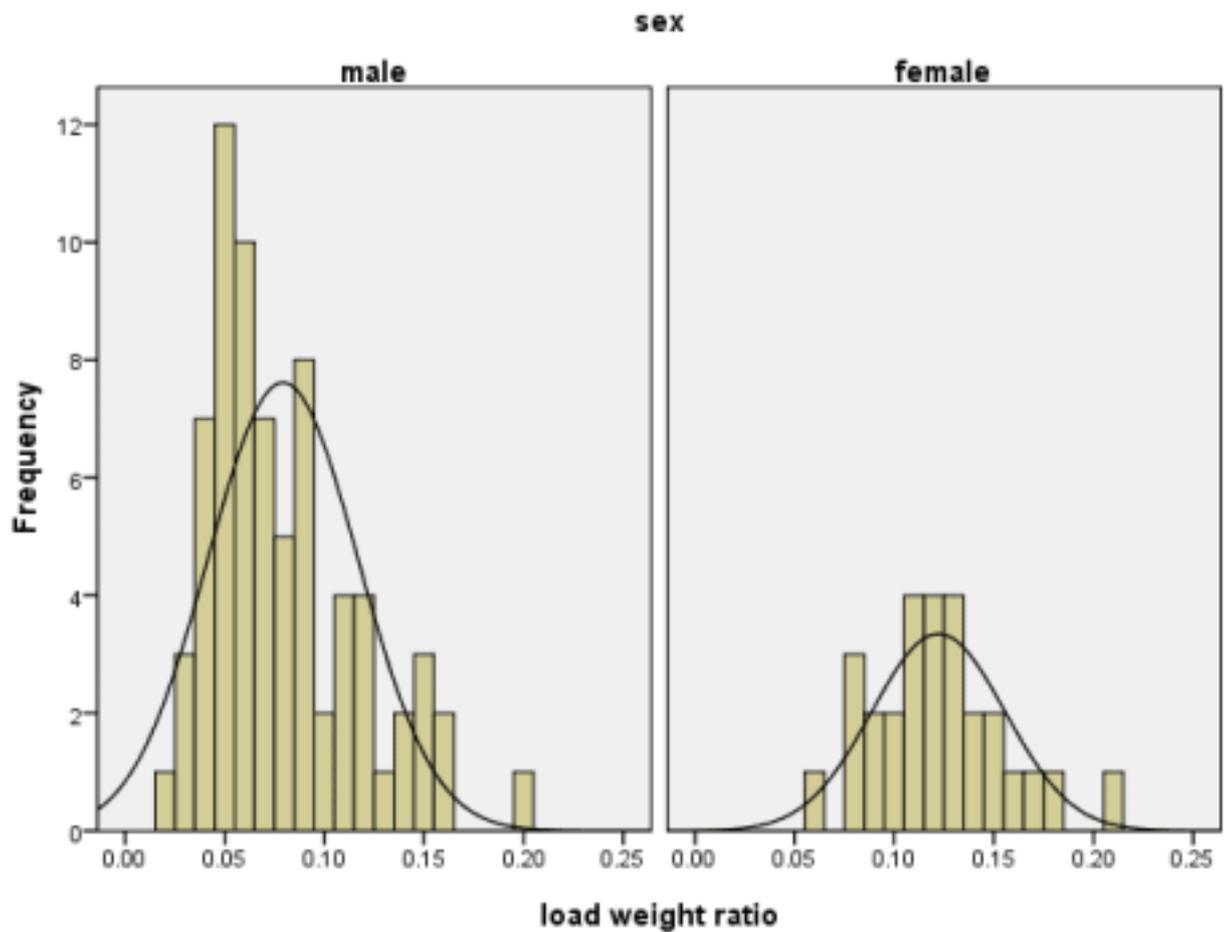


Figure 6 Distribution of load weight around the mean upon sex



**Table 3** Carrying side and LWR

		LWR.Cat				Total
		normal. 01 - 0.05	moderate 06 - 0.09	over load 0.10- 0.15	very severe over load 0.16 and above	
carrying right side	Count	12	10	3	0	25
	% within LWR.Cat	52.2%	27.8%	8.8%	.0%	25.0%
left	Count	4	3	0	1	8
	% within LWR.Cat	17.4%	8.3%	.0%	14.3%	8.0%
back carrying	Count	7	23	31	6	67
	% within LWR.Cat	30.4%	63.9%	91.2%	85.7%	67.0%
Total	Count	23	36	34	7	100
	% within LWR.Cat	100.0%	100.0%	100.0%	100.0%	100.0%

**Table 4** summary of findings

No	Variable	Statistical test	SIG.
1)	Female sex	Mann Whitney U =379.500	p < 0.00
2)	1st 2 elementary class	spearman r = - .725	p < .01
3)	Vital capacity person	Pearson r = , -0. -0.707	p < 0.01
4)	Back flexion	Pearson r = 0. 266	p < 0.01
5)	back flexion severity	spearman r =0.245	p< 0.05
6)	back extension	Pearson rho r = - 0.510	p < 0.01
7)	Back lateral bending to the right	Pearson rho r = - 0. 468	p < 0.01
8)	back lateral bending to the left	Pearson rho r = -0.544	p < 0.01

# Pre-Operative Blood Testing in the Pediatric Age Group - Is It Necessary?

## ABSTRACT

**Objectives:** To examine the value of pre-operative blood testing in children scheduled to undergo minor elective surgical procedures under general anesthesia; (Day-Case Surgery).

**Methods:** Retrospectively we reviewed the medical records of 430 children who presented for elective minor surgical procedures in the division of pediatric surgery, King Hussein Medical Center, Amman, Jordan from January 2006 to December 2007. Pre-operative investigations (complete blood count, urea and electrolytes) were analyzed in the form of frequency of abnormalities, and the effect of the abnormal results on the procedure. The relationship between the complication and the abnormal results was also examined.

**Results:** During the one year study period, 430 children were subjected to these pre-operative blood tests before minor elective procedures such as inguinal herniotomy, hydrocelectomy, orchidopexy and others. A total of 860 tests were performed, of which 86 (10%) were abnormal. Twelve children had abnormal hemoglobin results (the lowest was 8.5 gm/dl). Thirty-one children had clinically insignificant platelets or white blood cell count. There were 28 abnormal electrolytes results which were very insignificant. No case was postponed due to these investigations. Seven complications arose, none of which could have been predicted by the pre-operative screening tests.

**Conclusion:** These results indicate that pre-operative blood testing in the pediatric age group undergoing elective minor surgical procedures has very limited value in patient management. It may be unpleasant for the patient and the parents. A detailed history and clinical examination are of greater value than routine laboratory tests in determining a child's fitness for surgery.

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## Introduction

Routine pre-operative investigations are used in most patients admitted for elective minor surgery in order to identify those at high risk of complications. Despite the fact that routine screening tests has no major influence in the management of the elective surgical patients, these tests continue to be performed in some hospitals. It is generally accepted that clinical history and physical examination represent the best method of screening the presence of a disease. Performing routine laboratory tests in patients who appear healthy after such screening is invariably of little use and a waste of resources. Several pre-operative screening investigations in the general surgical population have been evaluated and their benefit questioned. Routine laboratory screening does not remove the possibility of peri-operative complications. In this study, we examined the value of widely accepted pre-operative investigation in otherwise healthy children scheduled for elective minor surgery.

## Methods

The medical records of the children who underwent routine elective minor surgical procedures in the division of pediatric surgery, King Hussein Medical Center, Amman, Jordan in the period from January 2006 to December 2007 were reviewed with respect to their age, sex, diagnosis, results of pre-operative investigations (complete blood count (CBC), urea and electrolytes), operative and post operative complications. Pre-operative investigations were assumed to be performed one day before surgery. Patients who had

active or ongoing disease and those on certain medications such as steroids that reflected active medical illness which could influence the outcome of surgery, were excluded. All abnormal results were identified. The numerical value of each result defined as abnormal when its value fell outside the normal range was determined by the stated reference range on the hospital blood form (mean+ standard deviations).

Changes in patient management or decision making because of abnormal blood test result were noted. All complications occurring during operative and post-operative periods were noted in detail stating whether the pre-operative blood tests were normal or not. The data were analyzed to determine the frequency of laboratory abnormalities and their effects on cancellations, intra-operative and post-operative complications.

## Results

During a one year period, the charts of 430 children scheduled for routine elective minor surgery were reviewed. There were 314 males and 116 females with a mean age of 4 years (range from one month to 13 years). The surgical procedures that had been done were inguinal herniotomy, orchidopexy, hydrocelectomy, repair umbilical hernia, repair epigastric hernia, esophageal dilatation, excision thyroglossal cyst, and excision branchial sinuses and other lumps.

A total of 860 blood tests were done pre-operatively. Eighty-six (10%) results were abnormal. Abnormal hemoglobin levels were obtained in twelve patients (1.3%), the lowest was 8.5 gm/dl in a 3-year

old girl with bilateral inguinal hernia. The other eleven had hemoglobin levels between 9-10gm/dl. No operation was canceled due to an abnormal result and no blood transfusions were administered to this group of children. Thirty-one children had abnormal platelet count. Only one, otherwise healthy child had a low platelet count ( $120 \times 10^9/L$ ) and the other thirty had a higher platelet count, the highest being  $592 \times 10^9/L$ . No action was taken and no complications related to abnormal platelet counts were observed. Abnormal white cell counts (WBC) were found in 22 children of whom none were less than  $3.0 \times 10^9/dl$  and only 4 were more than 14,000. No pre-operative management was altered due to abnormal WBC count and no complication arose. There were 26 abnormal urea and electrolytes results from 430 results. There were 14 abnormal potassium results, but no one was outside the traditionally accepted surgical anesthetic limits of 3.0-5.8 mmol/L. Ten children had abnormal sodium results. The lowest value was 132 mmol/L and the highest was 147 mmol/L. There was no associated anesthetic intervention in any of these patients and there was no operative or post operative complications. Four complications occurred, 2 wound infections, one hematoma at wound site and one hernia recurrence, all of them in patients with normal complete blood count and normal urea and electrolytes.

## Discussion

A policy of routine blood testing before operations has become ingrained in surgical and anesthetic practice. Performing an investigation to detect an abnormality seems a very reasonable action. However, before requesting an investigation, one should answer the following questions:

1. Will this investigation yield more information not revealed by history and physical investigation?
2. Will the result alter the management plan?

These questions are of paramount importance if the burden of work on

hospital staff is to be reduced, and if patients are not to be subjected to further investigations on the basis of a borderline abnormal result. Delahunt and Turnbull<sup>14</sup> and later Kaplan *et al*<sup>5</sup> demonstrated that many pre-operative screening tests in the general surgical population rarely detected abnormalities, and when abnormalities were detected management was not altered significantly. Wilson *et al*<sup>16</sup> demonstrated that in 96% of cases, the decision regarding fitness for elective surgery can be made on the basis of history and clinical examination alone. In our study, 86 of 860 tests (10%) were abnormal, a figure which is very similar to that found by Johnson<sup>7</sup> and Johnson *et al*<sup>8</sup>. No case was postponed as a result of these investigations. Blery *et al*<sup>19</sup> believed that the elimination of unnecessary routine test is of great importance, particularly in healthy patients undergoing elective surgery.

Detecting a minor or moderate degree of anemia before a minor surgical procedure may not contribute to the general health of the child. Mild degrees of anemia may not be detected clinically from medical history or physical examination. However, mild anemia should not increase the risk of general anesthesia and the anesthetic techniques need not be modified in any way to accommodate the mildly anemic state. The minimal safe level of hemoglobin required before administration of general anesthesia is unknown. There is no published evidence that operating on children with mild anemia is unsafe.

The prevalence of unanticipated elevations of white blood cell count is very low. Turnbull *et al* and Rohrer *et al* assessed management changes related to abnormal white cell counts and found that no patients had a management change. No antibiotic was given pre-operatively or post operatively in the cases of elevated white blood cell count. No management was altered, and no complication arose due to the abnormal results.

The majority of the abnormalities in our series were the high platelet count (30 cases) seemed to be

an aberration of the normal range rather than a significant clinical feature. Most of these abnormal results were coincidental findings in tests routinely performed along with the hemoglobin, and there were no indications for them to have been specifically requested. There was no evidence from the clinical records that these results made any difference to the clinical course or outcome. No further tests were deemed necessary in this group. For these reasons, routine platelet counts are not recommended before surgery unless the history and the physical examination suggests a high likelihood of thrombocytopenia or thrombocytosis.

The relationship between electrolyte abnormalities and perioperative morbidity and mortality is poorly defined<sup>18</sup>. Pre-operative routine biochemistry testing in routine elective minor surgery has an extremely low yield of abnormal results. The low percentage of patients who had abnormal results regarding potassium and sodium levels was neglected as none were outside the traditionally acceptable surgical and anesthetic limits<sup>19</sup>.

We believe that routine pre-operative blood tests are not indicated in all children, and we have recommended the following:

- a) A detailed clinical history and physical examination should be performed and findings from these should guide the selection of blood tests;
- b) History of pre term birth, a pre-existing medical illness, failure to thrive, recent history of blood loss, and a significant family history of blood diseases such as anemia, are indications for further investigation.

In conclusion, routine pre-operative testing of all patients before minor elective surgery is unjustified. The frequency of unanticipated abnormalities is too low to justify a practice pattern of testing all patients. The practice of selective testing of children, after a careful history and physical examination should decrease the discomfort of the child and the family, as collecting a blood sample from a child can often be

an unpleasant experience for all concerned, and reduce laboratory costs without compromising safety and quality of care<sup>20</sup>.

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# Factors that can be Attributable to Radiation Dose Reduction among Pediatric Age Group Undergoing Brain Computed Tomography (Practices at KHMC, Jordan)

## ABSTRACT

**Objectives** The aim of our study is to identify factors that can decrease radiation dose in the pediatric age group during brain CT scan examination at Radiology Department of King Hussein Medical Center.

**Patients and methods** From June to July 2008 at King Hussein Medical Center, for 150 children aged from 2 months to 13 years, brain CT scan was obtained for these children. Factors and exposure parameters that were used in the scanning technique and that can affect radiation dose that children might receive, were the tube current (milliamperere per second, mAs), kilo voltage peak (kVp), pitch or advancement of the scanning plane through patients, number of slices and slice thickness. Our study was done to assess the effect of each factor on radiation dose that children might receive by modification (reduction or elevation) of one of the applied scanning parameters. Patients were classified regarding the modified scanning parameter, into four groups (changing and modifying one of these exposure parameters while maintaining the others unchanged). The radiation dose that every child received with these modified scanning techniques was recorded by CT scan machine automatically, and analyzed.

**Results** 89 patients were female (59.3%) and 61 were males (40.6%) with an average weight of 16kg (range 3.2-21). Children were classified into four groups: the first group was children with reduced mAs, where the tube current ranged from 80 to 280 mAs, with a median tube current of 159 mAs; the second group was children with modified pitch ranged from 1-2 with median pitch of 1; the third group were investigated children with different numbers of slices ranging from 18-26 and slice thickness (5-8). Analyzing radiation dose recorded by the CT scan machine for the obtained brain CT scans for all investigated children, we found that the most valuable applied scanning protocol among the pediatric age group during brain CT scan, that can limit and

reduce received radiation dose to the minimum without loss of image quality and diagnostic information, was scanning with low Ma-s (less than 150), followed by increasing the pitch value up to 1.5, slice thickness of 5mm. 20 slices was the number of slices that were obtained and there was little variation with the used kVp which was 140, and the used Kvp ranged from 120-140. Analyzing the recorded dose while we changed one of the scanning parameters we found that the highest radiation dose received was when we used high mAs reaching up to 280 and low pitch up to 1 large slice thickness up to 8mm with an increase in number of slices until 26 slices. Finally a 5 mm Slice thickness was the most suitable for image resolution and low radiation dose. In all obtained brain ct scans we were concerned about radiation dose reduction to the maximum levels without loss of diagnostic information

**Conclusion** The main aim of all radiological investigations especially in children is maximum diagnostic benefit and least radiation dose and to achieve that it is worth considering adjustment of pediatric protocols using low radiation dose settings and most recently, modified scanning techniques to avoid excessive, unnecessary and harmful radiation that investigated children might receive.

**Key words** mAs, kVp, mGy, Msv, radiation dose, computed tomography.

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## Introduction

The use of brain computed tomography has increased rapidly in the past two decades<sup>1</sup>, however it is generally felt that up to one third of CTs performed on children are not pertinent to either the diagnosis or management, nor is it necessarily the best test<sup>3</sup>. Children are not only more sensitive to radiation than adults, but they will have more years in which cancerous changes might occur<sup>3</sup>. Dr Levatter et al mentioned that nowadays the rate of increase of CT examination is probably higher in children, who are more sensitive to radiation induced cancer<sup>4</sup>. For patient protection we should use the right technical parameters to avoid excessive, harmful and unnecessary radiation dose for these investigated children by CT scan and the clinicians should always be concerned and be strongly attentive to minimize CT scan radiation dose for children. To reduce the radiation dose, appropriate strategies have been developed to optimize scanning practices based on clinical indications, the age or body size of the patients, the area being investigated, and low radiation settings<sup>5</sup>. Technical developments with automated exposure control<sup>6</sup> can also help in optimizing the relationship between image noise and radiation dose (balance between image quality and radiation dose).

Various quantitative measures are used to describe the radiation dose delivered by CT scanning, the most relevant being absorbed dose, and effective dose.

The absorbed dose is the energy absorbed per unit of mass and is measured in grays (Gy). The organ

dose (or the distribution of dose in the organ) will largely determine the level of risk to that organ from the radiation. For risk estimation, the organ dose is the preferred quantity.

The effective dose, expressed in sieverts (Sv), is designed to be proportional to the estimate of the overall harm to the patient caused by the radiation<sup>7</sup>.

## Methods

In June 2004, 150 brain CT scans obtained in 89 females and 61 males, referred to the radiology department for different causes, and a brief clinical history was obtained. Adjustments made in the exposure parameters to determine the amount of radiation children who might receive from CT scan.

We performed brain CT scan using a modified pediatric CT scan protocol, by changing exposure parameters to assess their effect on radiation dose. Brain computed tomography was done using GE Light Speed Plus machine (GE Healthcare, CT, USA). Images were obtained using a multi-slice spiral computed tomography (CT) system of 5 mms slice thickness without automatic selection of effective -mAs (E-Mas). All HCTs were reviewed by a radiology specialist. Radiation dose and exposure factors (scanning parameters) were analyzed. Scanning parameters that affect radiation dose include peak kilovoltage, (tube current-milliampere-second), pitch, number of slices and slice thickness.

Patients were categorized into four groups according to the applied modified scanning protocol. We modified in our study just one exposure parameter: reduced mA, reduced kVp, and increased pitch and slice thickness, which are inversely proportional to radiation dose. However adjustment of two or three exposure parameters is also possible.

## Results

From 150 patients referred to our radiology department 32.2% underwent brain CT scan for head injury, 21.1% for abnormal movements including convulsions,

14.4% with chronic headache and 31.3% for developmental delay, psychiatric disorders and miscellaneous reasons. 83.4% of brain CT scan results were normal. We reviewed the literature regarding radiation dose reduction during brain CT scan, depending on many scanning parameters and exposure factors. These scanning parameters are tube current (milliampere per second), kilovoltage peak (kvp), pitch, slice thickness and number of slices. In our study we classified children into four groups to assess the effect of these factors on dose reduction by reducing or elevating one of these parameters while maintaining the other parameters unchanged. However proper modification to maintain proper image quality is mandatory. We then analyzed the radiation dose (recorded by ct machine) that the patient received, with the new modified scanning exposure.

### Patients groups were:

The first group included children scanned with modified and reduced tube current with mAs ranging from 90-280 (n=90, 60% of the investigated children), with a median tube current of 159 mAs. The second group of children with high pitch ranged from 1-2 (n=38 (25.3%)), and the third with low KVp 120-140 (n=12 (8%)) and the last group was children with applied modified scanning protocols with increasing number of slices from 18-22 slices and slice thickness from 5-8 mm slice thickness (n=10(6.6%)). We found that low mA was the most common technique used by (60%) up to 80 mAs and the most important scanning parameter that can significantly decrease received radiation dose during ct scan, followed by high pitch up to 1.5 (25.3%), low kilo voltage peak 140 (6%) and decreased number of slices to 18 slices and slice thickness up to 5 mm (2%). There is also a trend to increase slice thickness as the age of the children increased but we usually use a slice thickness of 5mm.

Age-based adjustments were made, however, 11-26% of CT examinations of children younger than 9 years are performed using

less than 150 mA. We found little variation in the kilovoltage used. For 34% of patients less than 140 kVp was used for brain scans, and 66% routinely used 140 kVp for brain scanning among the pediatric population. Other modifications included shielding of radio sensitive organs, avoiding multiphase examinations, using automatic modulation of tube current, using thicker collimation and these can be very helpful in radiation dose reduction. The radiation dose CTDI measured in mlligrays, displayed on the CT monitor) was calculated by the CT scan machine automatically, after we did adjustments and modification of exposure parameters DLP ranged from 200 mGy -2100.

## Discussion

CT is an important imaging modality for examining children, and its use is increasing rapidly. Given the recent attention to radiation risks and CT in children, the need for adjustment in scanning protocol in this population would be helpful<sup>8</sup>. Physicians, CT technologists, CT manufactures and other medical organizations share the responsibility to reduce radiation doses to children and efforts should be made to decrease the number of CT studies that are prescribed.

In the evaluation of scanning protocols used for pediatric patients we found that the CT dose should be reduced to be as low as reasonably achievable to meet clinical needs, therefore CT dose reduction will require a combination of approaches<sup>3</sup>.

Current guidelines do not recommend obtaining brain CT scan for children, unless the history and physical examination indicate that, otherwise every child requires an accurate, efficient, and optimal, diagnostic work-up, avoiding excessive testing and radiological investigations which is potentially harmful. CT scan should not be ordered for children below ten years indiscriminately<sup>9</sup>. Richard Smart et al mentioned that it is both economically and ethically desirable to restrict the use of diagnostic radiation to only those who will benefit from it<sup>10</sup>. If CT scanning

parameters used for pediatric patients are not adjusted on the basis of examination type, age and/or size of the child, then some patients will be exposed to an unnecessarily high radiation dose during CT examinations<sup>11</sup>.

Special considerations are also required to protect children who are generally more sensitive to the short and long term detrimental effects of radiation exposure<sup>9</sup>. Prudent clinicians should order only those studies that result in clinically important information and efforts should be made to minimize radiation exposure<sup>12</sup>. CT radiation doses need to take into account patient age and the selected X-ray technique, cross sectional areas and mean Hounsfield unit (HU). The radiation dose reduction to particular organs from any given CT study depends on many factors including replacement of CT use with other imaging modalities such as ultrasonography and magnetic resonance imaging (MRI) which have less radiation dose, and decrease in the number of CT studies that are prescribed. We found also that the automatic exposure-control option on the latest generation of scanners also helps in radiation dose reduction. Multiple factors can affect radiation dose and the most important are the number of scans, the tube current and scanning time in milliamp-seconds (mAs), size of the patient, the axial scan range, the scan pitch or advancement of the scanning plane through patients, the degree of overlap between adjacent CT slices, the tube voltage in the kilovolt peaks (kVp), and the specific design of the scanner being used. Pitch and number of slices, and slice thickness were inversely proportional to radiation dose, while the Ma (current tube) is directly proportional to the radiation dose. We found little variation in the kilovoltage used.

Finally we used a reconstruction as recommended by the manufactures for brain ct scan<sup>13</sup>.

Many of these factors are under the control of the radiologist or radiology technician. The mA-s are the most important factor affecting dose reduction, because increased dose per milliampere-second, increased

radiation risk and increased exposure risk with  $p < 0.001$ . For helical CT at a fixed X-ray energy, and scanning time, the radiation dose to the patient is directly related to the X-ray tube current<sup>14</sup>. The dose is directly proportional to the selected tube current-time product; therefore a reduction in mAs by 50% results in a reduction of a dose by half<sup>13</sup> and inversely proportional to number of slices, slice thickness and pitch. In our department during brain CT scanning the tube current ranged from 90 to 280 mAs, with a median tube current of 159 mAs. Kilo voltage of 120 may not be the optimal level for examining infants<sup>8</sup> so we use a typical 140 kVp X-ray beam

Several studies have suggested that a technique with significant reduction in exposure parameters (milliampere -seconds) could be adopted for pediatric ct protocol without significant loss of information<sup>1</sup>. Adjustment of pediatric protocol, means that children should not be scanned using adult exposure parameters, so we should use lower Ma-s, followed by high pitch which is inversely proportional to the radiation dose (a decrease in pitch by half increases the dose by two), low peak kilovoltage, fewer slices and lesser slice thickness and lower radiation dose settings. So if we are using a CT scanner without automated dose adaptation, we should look up tables with reference to suitable brain ct scan parameters, especially for children. Finally we found that by applying these modifications to the scanning protocol we can achieve low radiation dose and minimize it to lower levels, and this confirms the importance of careful selection of technical parameters for each type of examination<sup>11</sup>. However inappropriate reduction of radiation exposure causes artifact noise and loss of signal intensity, sometimes resulting in poor image quality<sup>10</sup>.

Therefore the radiologists must be attentive to their responsibility to maintain an appropriate balance between diagnostic image quality and radiation dose.

Major national and international organizations responsible for evaluating radiation risk, established

immediate and long term strategies to minimize radiation exposure in children.

These include:

- perform only necessary CT examination and
- adjust exposure parameters for pediatric CT based on: child size/weight;
- Region scanned: the region of the body scanned should be limited to the smallest necessary area, organ systems scanned: lower mA settings should be considered for skeletal and lung imaging and long term strategies including, encourage development and adoption of pediatric ct protocols, educate working staff through journal publications and conferences within and outside radiology specialties, conduct further research to determine the relationship between CT quality and dose, to customize CT scanning for individual children, to optimize exposure settings and to assess the need for CT in an individual patient.

An estimate made by Brenner et al estimated a lifetime increased risk of cancer for children younger than 15 years that results from CT scans, that 600,000 abdominal and head ct examinations annually on children under the age of 15 years could result in 550 cases of cancer attributable to ct radiation<sup>14</sup>.

## Conclusion

In the light of rapidly increasing frequency of pediatric CT examinations, dose reduction while preserving the value of CT examination and image quality, is a challenging task.

Therefore, if a ct scan has to be done on a child, radiologists need to ensure that the dosage is reduced to the minimal appropriate levels without loss of diagnostic information by adjusting and modifying the applied pediatric CT scanning protocols, using low radiation dose settings.

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# Use of Prenatal Ultrasound in Al-Hassa, Saudi Arabia

## ABSTRACT

As ultrasonography during pregnancy is widely practiced in both developing and developed countries and is used on every pregnant woman, a comment on this diagnostic tool in the light of routine antenatal care is warranted.

This study was carried out in 2008 on 2,039 Saudi mothers, to describe the routine provision of prenatal ultrasound (PNU) scanning and its variation according to some predictors.

Data was collected from mothers within two weeks after delivery, during birth registration.

Only 7.6% of mothers never received PNU during the index pregnancy. The mean number of PNU examinations performed for mothers who received prenatal care was  $2.37 \pm 2.1$  (median of 2.0). This mean was significantly higher among mothers of urban residence, of older age groups; and those seeking prenatal care at sites other than primary health care centres.

Strict implementation of quality assurance guidelines in all sectors providing prenatal care will decrease the routine use of the third or above PNU.

**Keywords:** Prenatal ultrasound - Prenatal care - Primary Health care - Saudi Arabia.

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## Introduction

Routine ultrasound examination has quickly become a social event that provides the first feeling of real contact with the new family member.<sup>1</sup> It has become an almost universal feature of prenatal care in most countries with developed health services.<sup>2,3</sup> As ultrasonography during pregnancy is widely practiced in both developing and developed countries and is used on every pregnant woman, a comment on this diagnostic tool in the light of routine antenatal care is warranted. There is no doubt that real-time ultrasound applied with most advanced apparatus gives detailed physical information about the foetus e.g. confirmation of the term date, detection of malformation, twins, foetal sex and placenta previa. However, routine ultrasound evaluation is not recommended and there has been controversy surrounding the use of ultrasound as part of routine antenatal care.<sup>4,5</sup> Although there is no reliable evidence of physical harm to human foetuses or their mothers from diagnostic ultrasound imaging, public health experts, clinicians and industry representatives agree that causal use of ultrasonography, especially during pregnancy should be avoided. Viewed in this light, exposing the foetus to ultrasonography with no anticipation of medical benefit is not justified and obstetric ultrasound should only be done for medical reasons, and exposure should be kept as low as reasonably achievable.<sup>6-9</sup> The issue of safety of ultrasound in pregnancy is a subject of continuous vigilance. Safety statements are regularly issued and updated.<sup>10</sup> There is no

scientific data available to support improved foetal outcome as a result of routine ultrasound.<sup>3</sup>

In the current Saudi practice according to the Ministry of Health guidelines, antenatal mothers should be routinely examined by ultrasound twice, the first between 16 and 18 weeks gestation and the latter between 34 and 36 weeks to ensure their wellbeing. The technique used is two dimensional real-time ultrasound.<sup>11,12</sup> If not available at the local primary health care centre, mothers were referred to a nearby health centre or hospital for a scan.

There is little data about the utilization of PNU examination in Saudi Arabia. The objectives of this study were to determine the frequency of PNU and its differential in Al-Hassa, Saudi Arabia.

## Population and Methods

This study was carried out in Al-Hassa, Saudi Arabia, during a period of six months from the first of January to the end of July 2008 G. All mothers of registered births during the study period were the target population.

Two-stage stratified sampling technique was used. The first stage is stratification of Al-Hassa into urban, rural and Hegar (Bedouin desert collections) areas. At the second stage, 15 out of 47 primary health care centres (PHCCs) in the region (five centres from each stratum) were chosen.

Mothers gave a verbal consent to participate in the study. They were assured that data collected will be dealt with confidentially and the impact of the study will be respected, maintained, and used only for

research purposes and for improving services.

In each PHCC an Arabic speaking female nurse completed questionnaires by interviewing mothers during birth registration (within two weeks of birth).

Questionnaire included mothers' residence, age and gravidity; source of prenatal care as well as the list of high risk pregnancies that is used during routine prenatal care.

Data were analyzed using SPSS (Statistical Package for Social Sciences) version 11. Descriptive statistics were done. The non-parametric Mann-Whitney test was used for comparison between groups.  $P=0.05$  was considered statistically significant.

## Results

During the study period 2,103 live births for 2,084 mothers were registered at the chosen PHCCs. A total of 2,067 (99.2%) mothers were interviewed and 2,039 (98.6% of the interviewed) received at least one prenatal care visit, whatever its source. Thus 1.4% of mothers never received prenatal care and subsequently no PNU examination during the index pregnancy.

Table (1) shows that among 2,039 mothers who received prenatal care, 94.6% underwent PNU at least once with a mean and median of 2.37 and 2.0, respectively. Of these mothers 35.7%, 24.1% and 19.2% underwent one, two and three or more PNU examinations, respectively. Thus among interviewed mothers 158 (7.6%) never received PNU (28 never received prenatal care and 130 received prenatal care without PNU examination).

Table (2) reveals that the mean number of PNU examinations was significantly higher among urban mothers, mothers aged more than 35 years and those seeking prenatal care at sites other than primary health care centres (private, hospital and shared care).

## Discussion

Ultrasound is an excellent means of assessing foetal well-being; however, it can be inappropriately

used, leading to excessive reliance on technology and increasing health care costs. Consequently, it is crucial to know the indications for ultrasound, its true value and limitations. There is a scarcity of published data on the frequency of PNU in Saudi Arabia. Our study adds to the literature and provides a snapshot of the frequency of use of PNU in one region of Saudi Arabia.

In our study, 92.4% of interviewed mothers received at least one PNU examination during the index pregnancy. More than one-third (35.7%) of mothers who received prenatal care, had only one PNU scan. On the other hand, one-third of them received three or more PNU scans. Previous studies in other regions of Saudi Arabia reported that 57.6% and 52.6% of mothers attending PHCCs received PNU at least once. Furthermore, only 8.9% of them received two or more PNU.<sup>13,14</sup> In Western countries, about 80% of pregnant women have at least one ultrasound during the pregnancy.<sup>8</sup> In rural Canada 97.1% of women underwent at least one PNU, 84.5% underwent at least two and 30.1% had three or more.<sup>15</sup> In USA at least one PNU was performed during 89% of pregnancies in 2004 compared to 67% in 2000 and 70% in 2002.<sup>16,17</sup>

Each woman seeking prenatal care, received 2.37 PNU scan on average with a range of 0 to 18. This is much higher than the average of 1.2 scans among mothers attending PHCCs for prenatal care in another region of Saudi Arabia.<sup>14</sup> In Canada, PNU use is increasing rapidly and for 1989-90 averaged 2.<sup>19</sup> scans per delivery in Ontario and 1.75 in British Columbia, up from 1.06 and 0.88 in 1981-82, respectively. In a later study in Western Labrador of Canada, the average was 2.<sup>16</sup> scans per delivery (range 0 to 7).<sup>15,18</sup> In Malta, an average of 2.6 PNU were performed on every pregnant mother.<sup>10</sup> A relatively recent study in USA revealed an average of 3.5 PNU scans per singleton delivery.<sup>16</sup>

Among women seeking prenatal care, the mean number of PNU scans was significantly higher among urban mothers than rural and Hegar

mothers. This is explained by the availability of ultrasound at private clinics, hospitals and PHCCs in the urban areas. This is supported by the finding that mothers who received prenatal care at private clinics or hospitals showed a significantly higher use of scans than those of PHCCs. An important finding is that the average number of PNU scans did not differ according to gravidity or risk status of pregnancy. This indicates that PNU scan is performed routinely, irrespective of the risk status. The same finding was reported in rural Canada.<sup>15</sup>

We cannot comment on what proportion of the scans reported in this study were medically indicated, furthermore gestational age at scanning cannot be ascertained.

We suggest more judicious use of PNU, according to quality assurance and current evidence-based guidelines. Routine use of third and above PNU for non risky pregnancies should be discontinued in favour of its use by clinical indication only.

Despite its limited scale, this study has identified issues for future research in routine use of PNU. A wide-scale national study is warranted to highlight medical indications, timing and women's attitude and perception of ultrasonography during pregnancy.

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**Table 1:** Distribution of 2,039 mothers who received prenatal care according to PNU examination

PNU examination	N	%
None	130	6.4
1	728	35.7
2	492	24.1
3 and more	391	19.2
Min - Max	0-18	
Mean ±SD	2.37±2.1	
Median	2.0	

**Table 2:** Variation of PNU examination by some maternal characteristics among mothers who received prenatal care

Characteristics	Total	Mean ±SD	Median
Residence:			
Urban	987	2.6±2.3ab	2.0
Rural	805	2.2±1.9a	2.0
Hegar	247	2.1±1.8b	2.0
Maternal age:			
<20 years	102	2.02±1.8 b	2.0
20-35 years	1599	2.4±2.1	2.0
>35 years	338	2.5±2.1 b	2.0
Gravidity:			
Primigravida	489	2.4±2.0	2.0
2 &3	702	2.4±2.2	2.0
4 and more	848	2.3±2.1	2.0
Source of Prenatal care:			
PHCCs	1238	1.36±0.97 a	1.0
Others#	801	3.9±2.4 a	3.0
High-risk pregnancy:			
No	1044	2.3±2.0	2.0
Yes	995	2.5±2.2	2.0

PHCCs= Primary Health Care centres

#Private clinics (650), Hospitals (66) and shared care (85)

a & b significant difference between the corresponding groups by Mann-Whitney test

# Psycho-Social Factors on People's Tendency to Sexual Change in the City of Tehran

## ABSTRACT

**Objective:** This research aims at identifying the differences between the roles of men and women (the expected role) and what they actually do (the adopted role). The Process of trans-sexuality as a topic in the domain of sex study is not well-considered so far in different cultures. This research mainly seeks to study the psycho-social reasons of the youth's tendency to trans-sexuality in the city of Tehran.

**Materials and Method:** This is a descriptive study and survey research. Data was collected by administering a researcher-made questionnaire. Cultural factors, socio-economic factors, religious values, legal and civil domains, psycho-social factors are considered to be the independent variables, and trans-sexuality (from male to female and from female to male) was considered as a dependent variable. The population included 312 transsexual people who had come to Tehran's Rehabilitation Centre. Among them 150 trans-sexual persons were selected randomly. They were divided into two groups of 75 subjects (one group with a tendency from male to female and the other group from female to male). Data were analyzed and it is defined that reliability of questionnaire (Cronbach's alpha) is 87%.

**Results:** The findings of the study indicate that there is a significant relationship between trans-sexuality and the variables such as life expectancy, the absence of parents, family support, job status, income, charges from society, respecting tradition, family satisfaction, education, respecting religious beliefs, lack of any kind of legal rule, and the functions of governmental institutions. In the first five components, the relationship is more significant in the group with tendency "from male to female", but the other factors are significant among the group with tendency "from female to male". Moreover, there is a significant relationship between trans-sexuality and four components of syntonía, asthenia, schizothymia, and hysteroidia. In the first three components, these were more significant among females with a desire to the male, and the fourth component is more

significant among the opposite group.

**Conclusion:** Trans-sexuals suffer from gender identity disorders, and some psycho-social factors influence their private lives and also social environment. Further research about trans-sexuality would be beneficial for their adjustment in society.

**Keywords:** Trans-sexuality, Sexual Change, Youth, Psycho-Social Factors, Tendency.

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## Introduction

Routine pre-operative investigations are used in most patients admitted for elective minor surgery in order to identify those at high risk of complications. Despite the fact that routine screening tests has no major influence in the management of the elective surgical patients, these tests continue to be performed in some hospitals. It is generally accepted that clinical history and physical examination represent the best method of screening the presence of a disease. Performing routine laboratory tests in patients who appear healthy after such screening is invariably of little use and a waste of resources. Several pre-operative screening investigations in the general surgical population have been evaluated and their benefit questioned. Routine laboratory screening does not remove the possibility of peri-operative complications. In this study, we examined the value of widely accepted pre-operative investigation in otherwise healthy children scheduled for elective minor surgery.

## Methods

In every society, people are categorized based on social factors like their role, situation, religion, race, ethnicity, etc. One of the most important social and cultural factors which distinguish people is gender. Many scholars believe that gender is likely to be the only substantial characteristic that determines

perception, viewpoint, behaviour and attitude of people in society and this characteristic is formed and highly influenced by social and cultural learning. It is believed that gender has at least three distinct levels, which are related to each other: Personal level (which consists of roles and personality), Inter-personal level and interaction (which consists of behavioural practices with others) and the social level (which consists of cultural beliefs and resource distribution)<sup>(1)</sup>.

Gender identity is formed by social interaction and transmitted from social agents (family, school, friends and public media). In other words, "a child adopts a specific gender identity by the socialization process and personality growth and using this personality he or she starts to reproduce behaviours, standpoints and values which the social environment dictates to boy or girl"<sup>(2)</sup>.

Based on this fact, gender identity means adopting self-physiological gender from the mental system of the individual and therefore conformity with his or her same sex throughout life in order to gain ordinary gender behaviour in personal and social life<sup>(3)</sup>.

There are individuals who feel deep and continuous dissatisfaction with their biological gender for several reasons and are inclined to the other gender. They feel dependency to the opposite gender, dissatisfied with their own gender and body and try to approach the opposite gender

using hormones and surgery. These individuals are stricken by Gender Identity Disorder (GID) or transsexualism<sup>(4,5)</sup>.

Sex Reversal Surgery (SRS) is surgery which alters corporal characteristics of an individual to the opposite sex. In other words, sex reversal happens when external sexual organs of one's body change. In cases of male to female, the surgery may consist of mammoplasty, testicle and phallus removal, and creating organs from phallus skin or the colon<sup>(6)</sup>.

Transsexuals have existed throughout history. In primitive societies, people believed that transsexuals were charmed and had magic powers or had a relationship with though Gods having a nice spirit and sacred attitude.

Today however, sex reversal surgery is done in many countries without considering whether these transsexuals are psychotic or they suffer harmonic-biologic or social disorders.

A survey conducted in 1994 in Tehran called "A survey on gender identity disorder of girls in Tehran province" on 168 children between 4 and 11 years in kindergartens, primary and guidance schools of Tehran, randomly. The results showed that the girls insisted on their female identity in all ages, as age influences the forming and evolution of gender identity<sup>(7)</sup>.

Another survey was conducted in 1997 called "The influence of environment on gender identity formation". This survey tries to clarify the effect of the environment and family on preventing gender identity disorders and the importance of the behaviour of parents of the children by studying current results and without overlooking biological differences. Finally, the survey prescribes some recommendations of which their effects are proven<sup>(8)</sup>.

Another survey was conducted in 1997 called "Surveying family characteristics of some transsexuals in Iran". The results of this survey showed that identifying family characteristics on formation of the

mentioned disorder, especially in Iran's social and cultural situations, plays a significant role in prevention and treatment of the disorder<sup>(9)</sup>.

From another survey called "Gender Identity disorders during childhood and adolescence" the following results were obtained: Gender identity means personal feeling of being male or female which starts from 3 and 4 years of age. To identify gender identity disorder, there are two primary criteria: a) Intense and continuous assimilation to the opposite sex; b) Continuous suffering from his or her own sex or non-conformity with his or her own gender role<sup>(10)</sup>.

The other survey called "Recognition and treatment of transsexual disorder by emphasizing spiritual treatment" was conducted. The results are as follows:

Using hormones and surgery for sex reversal are the only available means of psychiatric treatments for this disorder which don't lead to a desirable outcome. It is observed that psychoanalytical methods, family treatment, psychological treatments and individual behavioral reformation in combination, have positive effects on the disorder<sup>(11)</sup>.

Another survey called "The relationship between the perceptions of gender roles and gender satisfaction" was conducted and led to the following results: The psychological differences of girls and boys are of significant importance because of their effect on sociability of adolescents and their perceptions of gender roles. The most considerable consequence of the survey explains that sexual beliefs of boys are less stereotypical in comparison with girls. Girls are more likely to desire to have the opposite sex in case of rebirth. This issue confirms that girls are more dissatisfied with their gender than boys. The fact that girls are more open to criticism because of their sentimental attitudes, leads to applying gender stereotypes in society and any avoidance of these stereotypes is considered a kind of disorder<sup>(12)</sup>.

Other research entitled

"Comparative study on sex-reversal in the scope of Iran - US laws based on the standpoint of legal medicine" was conducted in 2005. The following results were obtained from a total of 57 cases on transsexuals of which 37 were male and another 20 were female cases: 17% of transsexual families ignored and disregarded the patient when he/she was upset<sup>(3)</sup>.

Other research entitled "Identifying personality disorders and personal characteristics of men suffering from gender identity disorder" was done in 2006. The results are as follows: Personality disorders were surveyed among two groups using multi-criteria clinical questionnaire of Milon (MCMI-II). The results showed that GID patients got high grades in 6 criteria of the Milon questionnaire (dependent, histrionic, anti-social, passive, aggressive, borderline, paranoia) that had distinctive difference in comparison to the evidence group in terms of statistics. In general, we can deduce that people suffering from gender identity disorders are more prone to personality disorders than ordinary people<sup>(13)</sup>.

Research entitled "The role of family to gender identity disorder patients" was conducted in 2007. Based on the results, the existence of gender identity disorder in people encountering sensational, sentimental and emotional issues in family are more probable and helping these people by family intermediation is likely to be effective. In addition, informing families about emotional and training needs of their children reduces the likelihood of the disorder<sup>(14)</sup>.

The bulk of gender identity - either normal or trans-sexual identity - arises from an unknown harmonic process during the second to fourth months of pregnancy<sup>(15,16)</sup>.

From the viewpoint of cause and effect, gender identity is categorized as follows: Genetic, Prenatal hormonal, Postnatal social, and Post pubertal hormonal.

When we see a woman working outside and in a career like truck driving or watchdogging and her

husband does housekeeping, we immediately come to deduce that the couple must have a deficiency<sup>(7)</sup>.

Gender identity disorder includes transsexual, transvestite, drug king, drug queen, lady boy and shemale.

In the US, the number of men dissatisfied with their sex is about 1.3 million and the number of women dissatisfied in term of their sex is about 1.4. In the US, the number of men has been operated to reverse their gender in 1960 was 1,000 and in 2000 was 20,000.

In Iran though, 470 persons have been referred to legal medicine from 1987 to 2004 of whom 270 were men and 70 were women and during 1987 to 2001, surgery on 214 were accepted, 11 cases were refused and the others never referred again. In the capital of the provinces, a total number of 57 were referred of who 35 wanted to reverse from male to female and 22 wanted the opposite. In general, the prevalence of this disorder is 1 in 30 thousand among men and 1 in 100 thousand among women.

Another survey called "Gender identity disorder and its social consequences" has resulted from the fact that gender and sex identity can have several socio-cultural implications<sup>(17)</sup>.

Since this phenomenon isn't limited to one element, so the factors which effect the phenomenon are as follows:

**a) Physical Factors:**

1. Endocrine disorder (sexual hormone management method);
2. Brain disorder (abnormal EEG);
3. Several unnatural factors during pregnancy;
4. Brain damage (scarlet fever, mental retardation, epilepsy);
5. Inherited factors;
6. Disorder in chromosomal or genetic factors;
7. Appearance tendency (picking up eyebrow, surgery, injection of paraffin into the breast and vice versa).

Based on the standpoint of Harry Benjamin -founder of the

international institute of trans-sexuals of the US- this disorder takes place because of the combination of hormonal, psychological and other similar causes.

In general, the characteristics of trans-sexuals are divided into four categories:

1. Those related to trans-sexualism;
2. Those resulting from trans-sexualism;
3. Those independent from trans-sexualism;
4. Those that could be found in any group of people with mental troubles.

**Psychological factors:**

1. Personality factors;
2. Psychological problems during childhood;
3. Sexual eagerness;
4. Mother's psychological problems during labor;
5. Gender role or recognition of sexual differentiation;
6. Psychotic problem;
7. Sexual hallucination;
8. Gender reversal delirium;
9. Paranoia;
- 10 Schizophrenia;
- 11 Stabilization;
- 12 Fixation in childhood;
- 13 Depression.

**b) Environmental Factors:**

It is obvious from the latest scientific research that formation and evolution of one's personality starts in utero\ It is obvious that parents and mostly acquaintances play a significant role to help normal sexual and mental growth of the baby during this time.

Improper environmental factors (social factors) speed up the process of transsexualism of which some of them are as follows:

1. The growth of child in an unsafe and improper environment;
2. The method of bringing up;
3. The poverty of parents;
4. Deprivation of parents, especially in the first years of youthfulness and the beginning of gender identification of the child;

5. Non-legitimacy of the child;
6. Leaving home;
7. Excommunication;
8. Social obliquity of the parents<sup>(18)</sup>.

**Materials and Method**

This research was done by survey. The questionnaire is the tool of data gathering. The amount of Cronbakh's alpha for considered identifications has been 0.89, and that shows the perpetuity of the research measurement tool.

The statistical universe consists of all the people on survey who researchers distributed sampling units amongst. So, the population of the current survey is 312 transsexuals referred to state welfare center in Tehran.

Among them, the available sample under survey, is transsexuals referred to the above organization and 75 men and 75 women, totalling 150, were selected. The transsexuals of Tehran have been selected by the method of simple random sampling.

The survey was conducted in 2007-2008 and the location was Shahid Navvab state welfare center in Tehran. Since the transsexuals mostly refer to state welfare organization, psychiatric institutes, legal medicine organizations and some offices for their sex reversal, then the researchers were obliged to refer to these centers in order to fill out their questionnaire. Finally, the data were gathered in Tehran Shahid Navvab state welfare center.

**Results**

The lowest age of male respondents was 20 and the highest was 49, the lowest age of female respondents was 16 and the highest was 38.

5.3 percent of male respondents were illiterate, 13.3 percent were under diploma, 53.3 percent had a diploma, 6.7 percent had an upper diploma and 21.3 percent were B.S.

1.3 percent of female respondents were illiterate, 13.3 percent were under diploma, 36 percent had a diploma, 20 percent were upper diploma and 22.7 percent were B.S and 6.7 percent were M.S.

Thirty two percent of male respondents were employed and 66.7 percent were unemployed. 29.3 percent of female respondents were employed and 65.3 percent were unemployed.

In social aspects, some social factors are effective on tendency to sex reversal.

About sex reversal (male to female): it seems that some social factors are effective on sex reversal. Chi-Square test was used. Considering the value of chi-square on the freedom factor of two and meaningfulness level below 0.05, it can be deduced that the relationship between two variables is not by chance and a meaningful, direct relationship exists between these variables. The Cramer coefficient also expresses the meaningfulness of the relationship between these two variables and its intensity.

It seems that there are relationships between the following variables and tendency of transsexuals to sex reversal.

Considering the above table, there exists a meaningful relationship between hope to live, family support, labeling value, occupation situation, income, education level, religious beliefs and lack of legal bills and regulations factor and tendency of transsexuals to sex reversal.

In psychological context, it seems that transsexual youth have a psychological dissociation (psychological childhood characteristic or stabilization in childhood feedback).

From female to male tendency, it seems that most of the transsexual youth have a psychological dissociation (psychological childhood characteristic or stabilization in childhood feedback). Chi-square test was used. Considering the value of chi-square test and meaningfulness level below 0.05, it can be deduced that the relationship between two variables is not by chance and a meaningful, direct relationship exists between these variables. The Cramer coefficient also expresses the meaningfulness of the relationship between these two variables and its

intensity.

From male to female tendency, chi-square test was used. Considering the value of chi-square test on the freedom factor of two and meaningfulness level below 0.05, it can be deduced that the relationship between two variables is not by chance and a meaningful, direct relationship exists between these variables. The Cramer coefficient also expresses the meaningfulness of the relationship between these two variables and its intensity. Therefore, both tests are meaningful for both variables.

It seems that there is a relationship between the tendency to sex reversal of transsexuals and environmental effect, inability, excitement, and dissociation of personality.

Correlation coefficient of Spearman was used to study the intensity of linear relationship of these variables.

Considering the above table, there exists a meaningful relationship between environmental effect, inability, excitement, and dissociation of personality and tendency of transsexuals to sex reversal.

## Conclusion

It seems that tendency to sex reversal is increasing quantitatively. However, it is worth considering that the percentage of boys tendency to reverse their sex to females is lesser.

The higher the wish to live as transsexuals, the higher the tendency of sex reversal. The more there is labeling, the more is the tendency of transsexuals to sex reversal. Also, the more family support, equates to higher transsexuals' tendency to sex reversal. Meanwhile, the better the occupation situation, the more transsexuals' tendency to sex reversal. This fact is true when more income is considered. The higher the education level, the higher transsexuals' tendency to sex reversal.

Most of transsexual youth suffer from psychological dissociation. The more environmental effect, the more tendency of transsexuals to sex reversal. The more excitement, the more tendency of transsexuals

to sex reversal. And finally, the more dissociation of personality, the more tendency to sex reversal.

## Recommendations

- Authorities should prepare an appropriate and safe environment for these people, so they can express their problems and possibly undergo treatment to find their real gender and be relieved from their sufferings.
- Lawyers should investigate the incentives to sex reversal and its consequences and also they should analyze related regulations, so they can apply laws related to sex reversal for those requiring it.
- The parents and families of transsexuals should understand their pains. On the other side, ordinary people should be introduced to the transsexualism phenomenon in order to help these patients.
- NGOs should be supported in order to organize and provide support for these kinds of patients.
- These patients are vulnerable to AIDS, so they should be introduced to its means of transmission. Therefore, this disease should be considered important.
- Transsexualism is not considered a criminal or insolvable problem in its essence. The problem is lack of social awareness and homophobia (panic, avoiding transsexuals due to fear and disregarding their personal and social rights or worse, disrespecting them). Therefore, by giving respect and support to these patients, not only will social unawareness be removed, but also opinion independence and moral sense will be experienced.
- It is better for families to refer to psychologists in case they are uncertain or doubtful about their child's sex prior to his or her maturity and follow up the issue. There is a possibility that doing that after maturity will be too late.
- Developing public and complementary insurances and unemployment insurance and devising proper economical, social, cultural and educational facilities for these people by government authorities, and leading facilities

and resources based on equality and non-discrimination approach throughout society for these transsexuals.

- Passing some rules in parliament to mandate genetic tests and consultation.
- Foundation of medical centers and professional practitioners proficient in sex reversal surgery, and equal job opportunities and maintaining their rights, should be considered.

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**Table 1:** social factors effective on tendency to sex reversal

Hypothesis	Test Type	Meaningfulness level	Degree of freedom	Cramer	Test Result
It seems that some social factors are effective on sex reversal	Male to Female				
	Chi-Square	0.021	2	0.69	A meaningful relation exists
	Female to Male				
	Chi-Square	0.004	2	0.76	A meaningful relation exists

**Table 2:** Correlation of Spearman between the variables and tendency of transsexuals to sex reversal.

Variable	Statistical Indicator	Tendency of transsexuals to sex reversal	
		Male to Female	Female to Male
Hope to Live	Spearman Correlation coefficient	0.64	0.53
	Meaningfulness Level of a Domain	0.000	0.000
	Sum	75	75
Family Support	Spearman Correlation	0.53	0.43
	Meaningfulness Level of a Domain	0.000	0.000
	Sum	75	75
Labeling Value	Spearman Correlation	0.69	0.73
	Meaningfulness Level of a Domain	0.000	0.000
	Sum	75	75
Occupation Situation	Spearman Correlation	0.63	0.59
	Meaningfulness Level of a Domain	0.000	0.000
	Sum	75	75
Income	Spearman Correlation	0.91	0.89
	Meaningfulness Level of a Domain	0.000	0.000
	Sum	75	75
Education Level	Spearman Correlation	0.55	0.67
	Meaningfulness Level of a Domain	0.000	0.000
	Sum	75	75
Religious Beliefs	Spearman Correlation	0.66	0.73
	Meaningfulness Level of a Domain	0.000	0.000
	Sum	75	75
Lack of Legal Bills and Regulations	Spearman Correlation	0.26	0.39
	Meaningfulness Level of a Domain	0.000	0.000
	Sum	75	75

**Table 3:** social factors effective on tendency to sex reversal

Hypothesis	Test Type	Meaningfulness level	Degree of freedom	Cramer	Test Result
It seems that most of the transsexual youth have a psychological dissociation	Male to Female				
	Chi-square	0.008	2	0.52	A meaningful relation exists
	Female to Male				
	Chi-square	0.032	2	0.63	A meaningful relation exists

**Table 4:** Correlation of Spearman between environmental effect, inability, excitement, and dissociation of personality and the tendency of transsexuals to sex reversal

Variable	Statistical Indicators	Tendency of transsexuals to sex reversal	
		Male to Female	Female to Male
Environmental effect	Correlation of Spearman	0.43	0.45
	Meaningfulness Level of a Domain	0.000	0.000
	Sum	75	75
Inability	Correlation of Spearman	0.53	0.66
	Meaningfulness Level of a Domain	0.000	0.000
	Sum	75	75
Excitement	Correlation of Spearman	0.69	0.58
	Meaningfulness Level of a Domain	0.000	0.000
	Sum	75	75
Dissociation of personality	Correlation of Spearman	0.58	0.63
	Meaningfulness Level of a Domain	0.000	0.000
	Sum	75	75

# Behcet's Disease in King Hussein Medical Center

## ABSTRACT

**Objectives:** To study how frequently we diagnose cases of Behcet's disease at King Hussein Medical Center, and what are the most common manifestations and the diagnostic tests used.

**Material and methods:** This Study was conducted as a retrospective survey on epidemiologic and clinical features of patients with Behcet's disease diagnosed at King Hussein medical center in Amman from 2004 to 2007. 107 patients were diagnosed with Behcet's disease when they fulfilled the International study group criteria for the diagnosis of Behcet's disease.

**Results:** The sex ratio was 1:3.3 with male predominance (82 male and 25 female). Clinically, 97 % had oral ulcers, 87 % had genital ulcers, 92 % had skin lesions and 32 % had ocular lesions. 36% had vascular, and 21% neurological manifestations. Arthritis was seen in 60%. The arthritis was intermittent, self-limiting, and non-destructive, involving large joints, mainly the knees and ankles. The pathergy test showed positive in 33 % of patients. HLA-B51 was positive in 48 and negative in 26 patients while undetermined in 33 patients.

**Conclusion:** Behcet's disease is not uncommon in Jordan so we must be more aware of its existence. Male predominance is prominent in our patients. Genital ulcer and ocular lesions were the most frequent manifestations. Positivity of pathergy test was not a frequent finding as in other studies done in different world countries.

**Key words:** Behcet's syndrome, Genital ulcer, Ocular lesions, pathergy test, HLA-B51.

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## Introduction

Behcet's disease (BD) is a multi-systemic disorder of recurrent acute inflammation. It is named after Hulusi Behcet, a Turkish dermatologist who, in 1937, recognized recurrent oral and genital ulcers and iridocyclitis as a separate clinical entity,<sup>1</sup> although symptoms similar to those of BD were described as early as the time of Hippocrates and later by several others.<sup>2-4</sup>

The prevalence of the disease varies widely from country to country and probably from race to race. The disease is more common in the Middle and Far East than in Europe and the USA.<sup>5</sup>

The major characteristic of Behcet's disease (BD) is a systemic vasculitis, with the mucosa, skin and eyes being predominantly involved<sup>7</sup>. Although BD may affect almost any system of the body with exacerbations and remissions of inflammation, the key clinical manifestations are recurrent oral aphthous ulcers, genital ulcers, uveitis and skin lesions, such as erythema nodosum, pseudofolliculitis, papulopustular lesions and acneiform nodules<sup>8</sup>.

HLA-B51 has been the most closely associated risk factor for BD<sup>9</sup>. There is no specific laboratory tests and pathognomonic findings in BD; therefore, the diagnosis remains largely a clinical one. It should be kept in mind, however, that recurrent oral ulcers are reported in almost all patients with BD<sup>10-12</sup>.

In the last 2 decades we have become more aware of the existence

of BD in Jordan. In this study we aimed to determine how frequently we diagnose cases of Behcet's disease at King Hussein Medical Center, what are the most common manifestations and the diagnostic tests used.

## Patients and Methods

King Hussein Medical Center is a teaching hospital, and receives referrals from all medical sectors in different parts in Jordan. It serves the armed forces personnel and the independents.

A total of 107 patients who visited the hospitals in the period between 2004 to 2007 were included as having Behcet's disease according to the International study group criteria for the diagnosis of Behcet's disease (Table 1)<sup>13</sup>.

The following data were collected from medical records and the patients themselves: patient's name, date of birth, sex, geographic distribution, clinical manifestations, durations of the symptoms, and positivity to pathergy test. Duration of symptoms was determined as the period from the beginning of at least one of the diagnostic symptom criteria to the patient's first visit. Geographic distribution was based on the location of patients' residency. Full clinical examinations were performed. Arthritis was defined as joint tenderness, swelling, and/or pain on motion. The following tests were carried out on all patients by standard methods: complete blood picture; erythrocyte sedimentation rate; urine analysis; antinuclear

factor test; rheumatoid factor test; serum uric acid; C reactive protein; serum proteins and electrophoresis; X-rays of the chest, hands, feet, pelvis, and any other affected joint. The ESR were regarded as raised if above 20 mm/1st h. C reactive protein readings were recorded as either positive or negative. Pathergy test was performed with oblique insertion of a 20 gauge needle under sterile conditions and read by a physician at 48 hr. Formation of papule or pustule was interpreted as a positive result. Tissue typing was performed on patients with BD by the standard NIH microcytotoxicity technique using antisera for A, B, and C locus antigen.

## Results

107 patients (82 male and 25 female) were included in the study. Geographical distribution showed the highest frequency in north of Jordan (69%) as in Table 2. The sex ratio was 1:3.3 with male predominance. Their ages ranged from 18 to 48 years with a median age of 18 (Table 3).

Clinical manifestations are summarized in Table 4 and were: had oral ulcers (97%), genital ulcers (87%), skin lesions (92%), Arthritis (60%), Gastrointestinal manifestation (36%), ocular lesions (32%), vascular (36%), and neurological manifestations (21%).

Definite arthritis was observed in 60% of patients, but arthralgia was reported more commonly. Arthritis was oligo- or polyarticular, intermittent, self-limiting, and non-destructive, involving peripheral joints, the knee being involved most frequently. Gastrointestinal complaints were reported by 36%, these being vomiting, abdominal pain, flatulence, diarrhoea, or constipation. 10 patients had pulmonary involvement in the form of pulmonary aneurysm in 3 patients and 2 with pulmonary emboli. No renal involvement was detected.

The pathergy test was done for all patients and showed positive in 89 patients (83%) and revealed negative in 18 (17%). The HLAB51 test was done for 69 patients and showed positive in 49 patients (71%) and

revealed negative in 20 (29%). There was no positive association between eye involvement, arthritis, HLA-B51 tissue typing, and positive pathergy test.

## Discussion

Behçet's disease (BD) is a multi-systemic disorder of recurrent acute inflammation. The disease may affect almost all/any systems or organs, including the ocular, pulmonary, gastrointestinal, genitourinary and nervous systems, as well as joints and large vessels. Nevertheless, the major characteristic of the disease is a systemic vasculitis with mucosa, skin and the eyes being predominantly involved.

The highest prevalence of the disease has been reported in Turks living in Anatolia (Northeastern Turkey) with 370 patients per 100,000 inhabitants<sup>14</sup>, while the overall prevalence in Asia is 20- to 30-fold lower and in Europe and the U.S.A. more than 150-fold lower<sup>15-18</sup>.

Interestingly, in areas with many ethnic populations, certain ethnic groups were found

mainly affected as for example in Kuwait. Kuwaiti Bedouins were not affected by the disease and there was only a prevalence of 1.58 per 100,000 Kuwaitis which was similar to the involvement of non-Arab populations (1.35 per 100,000 inhabitants), while 2.90 per 100,000 non-Kuwaiti Arabs were affected<sup>19</sup>.

In populations with the same ethnic origin as in Jordan the prevalence of the disease seems to be strongly dependent on the longitude or the latitude of their residence. The prevalence in Jordan populations was calculated to increase up to 3-fold by going to the North (Table 2).

Our study shows that sex ratio was 1:3.3 with male predominance which is similar to reports from other Arab countries such as Saudi Arabia, Iraq, Kuwait, and Jordan, and disclosed a male to female ratio of BD of 1.2:1 to 3.4:1. The clinical expression of BD as well as HLA-B51 association are also similar to that found in most of the series studied in those countries in the percentage of patients with genital ulcers, skin manifestations,

and central nervous system involvement.<sup>20-23</sup>

As in other studies, the positive rates of major symptoms revealed that the most frequent symptoms were oral ulcers and articular. Moreover, the positive rate of ocular lesions in the present study was much higher than that in the previous studies in Jordan. The increase in frequency of ocular lesions may be due to the increase in routine tests for the eyes since the ocular lesions are considered to be one of the most important prognostic factors.

The positivity of the pathergy test in the present study (33%) was significantly higher than that of Japan (43.8%) and China (62.2%).<sup>24,25</sup> This observation may be attributed to the differences in the method of pathergy test or to the racial differences. The positivity of pathergy test is especially high in the Middle Eastern countries, which made the test as a crucial parameter of diagnosis of Behçet's disease.

In conclusion, Behçet's disease remains an elusive disorder, having variable clinical presentations and unknown etiology, and lacking any specific therapy. However, in view of the establishment of well-defined diagnostic clinical criteria, it should now be possible to investigate the cause and therapy of this potentially serious disorder with greater focus than was previously possible. Behçet's disease is not uncommon in Jordan so we must be more aware of its existence. The male predominance is prominent, higher frequency of genital ulcer, ocular lesions, and positivity of pathergy test in the patients. The positivity of the pathergy test and the possession of the HLA-B51 antigen differ from country to country and that positivity of the pathergy test is not related to the presence of the HLA-B51 antigen.

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**Table 1:** Adapted from International Study Group for Behcet's disease. Criteria for diagnosis of Behcet's disease (13).

Major criteria (need 1)	Recurrent oral ulceration	Minor aphthous, major aphthous, or herpetiformis ulceration observed by physician or patient that recurred at least three times over a 12-month period
Minor criteria (need 2)	Recurrent genital ulceration	Aphthous ulceration/scarring observed by physician or patient
	Eye lesions	Anterior or posterior uveitis or cells in vitreous on slit lamp examination; or retinal vasculitis observed by ophthalmologist
	Skin lesions	Erythema nodosum observed by physician or patient, pseudofolliculitis or papulopustular lesions; or Acneiform nodules observed by the physician in a post adolescent patient who is not receiving corticosteroid treatment
	Positive pathergy test	As interpreted by physician at 24 to 48 hours

**Table 2:** Geographical distribution of patients.

Area	No of patients	Percentage
North of Jordan	74	69%
Middle of Jordan	24	22%
South of Jordan	9	0.08%

**Table 3:** Number and ages of patients at presentation

Age range	No of patients	Percentage of patients
10-19	12	11%
20-29	52	48%
30-39	37	35%
40-49	5	5%
50-59	0	0%
60-69	1	1%

**Table 4:** Clinical features in 107 patients with BD

Clinical feature	Number of patients	Percentage
Oral ulceration	104	97%
Genital ulceration	93	88%
Skin manifestation	99	92%
Eye involvement	34	32%
Arthritis	64	60%
Neurological manifestation	22	21%
Gastrointestinal manifestation	39	36%
Vascular	39	36%