

ABOUT MJHS

Majmaah University is publishing "The Majmaah Journal of Health Sciences" which is committed at being a dynamic and professionally motivate to promote research & evidence based practice in medicine and health sciences. MJHS is a peer-reviewed open access biomedical journal covering all aspects of Basics and Clinical Sciences, Medical Education, Public Health, Research and Publication ethics from all Medical and Health Sciences background.

The mission of the Journal is to identify and share common issues, themes and strategies for the enhancement of standards of professional care and to promote communication between Saudi Arabian and international medical and health science community in order to promote excellence in health education and practice.

Majmaah Journal of Health Sciences intends to serve researchers through prompt publication of significant advances in the field of medical and health sciences and also provide a forum for the reporting and discussion of current issues. The Journal aims to provide the most complete and reliable source of information on current developments in the field of health science. The emphasis is on publishing quality articles promptly and making them freely available to researchers worldwide, therefore providing the maximum exposure to the articles. The Journal has been an essential reading for scientists and researchers who wish to keep abreast of the latest developments in the field.

**IN THE NAME OF ALLAH,
THE MOST GRACIOUS,
THE MOST MERCIFUL**

Kingdom of Saudi Arabia
Ministry of Education
Majmaah University



MJHS

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About the Journal

Majmaah Journal of Health Sciences

Vision

The Majmaah Journal of Health Sciences shall be an international peer reviewed journal, which intends to serve researchers through prompt publication of significant advances, and to provide a forum for the reporting and discussion of news and issues concerning health sciences.

Mission

To lead the debate on health and to engage, inform, and stimulate the academicians, researchers, and other health professionals in ways that will improve outcomes for patients.

Objectives

To promote research & evidence based practice in health sciences, so that a firm scientific knowledge base is developed, from which more effective practice may be evolved.

To ensure that the results of the research are rapidly disseminated to the practicing clinicians and educators, in a fashion that conveys their significance for knowledge, culture and daily life.

Correspondence and Subscription

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Majmaah Journal of Health Sciences

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Editorial

On behalf of the entire present editorial team, it gives me great pleasure to welcome you to this new issue of the Majmaah Journal of Health Sciences (MJHS, ISSN: 1658-645x). At the outset I wholeheartedly thank our respected Rector, **Dr. Khalid bin Saad Al Meqrin** and the Vice Rector for Graduate Studies and Scientific Research **Prof. Dr. Mohammad Bin Abdullah Al-Shaaya'a** for entrusting me with this responsibility of developing the bringing out the prestigious journal of our university. I would also like to thank the founding Editor-in-Chief **Professor Dr. Mohammad Othman Al-Rukban** and his editorial team for their commendable efforts and great contributions towards the MJHS.

The MJHS is a peer-refereed journal with a broad scope to bridge knowledge between medical, dental, applied medical health sciences and rehabilitation fields. In short, the MJHS provides an excellent platform for all health related professionals to interact through scientific contributions and discussions.

Knowledge is progressing by a geometrical ratio and it is important that we too become a part of this fast pace of progress. This goal of propagating knowledge can be achieved not only through assimilation but also through dissemination of knowledge. Realization of the maxim, 'publish or perish' in the world of science has inspired and encouraged many organizations to start and sustain their own journals and publications. Scientific journals have played a great role in this new era of removing the darkness of unawareness hence enlightening the minds and brains with the lamp of new knowledge and thoughts. The experience and knowledge of senior faculty members should reach the upcoming generations and the new ideas of young researchers should reach all professionals.

The scientific journals can provide a gateway to transfer knowledge and add meaning to all readers. Knowledge is power and it has a unique quality in that as we get to know more, the volume of the unknown seems to keep on increasing as rightly stated by "known is a drop, unknown is an ocean". Knowledge is something that we keep on gaining for as long as we keep on sharing. In this era of education, publishing is turning out to become more and more significant. I strongly believe that this issue will add a drop of knowledge in the minds of our readers.

Different types of articles are included in the MJHS, such as research articles which report the results of research studies on a range of topics varying from the basic

mechanisms of diseases and dysfunctions to clinical trials that compare the outcomes of different treatments. Review articles that summarize and analyze the information available on a specific topic based on a careful synthesis of existing medical literature. Rare case reports, which educate clinicians about particular illnesses and how to treat them. Editorials, which are short essays that express the views of the authors, often regarding research or review articles published in the same issue. Letters to the editor, which provide a way for readers to express comments, questions, or criticisms about articles published in the MJHS.

In the end, I wish to congratulate the entire editorial team for their tireless efforts and perseverance towards the MJHS. I would also like to extend special thanks to all the anonymous reviewers for their efforts for processing the articles in the required time. An issue at hand is to get the MJHS indexed in Pub Med, for which we have to work with an unshakable focus and move ahead steadily on the road of progress and I am confident that we will achieve this goal very soon with joint concerted efforts. Your valuable suggestions will help us to improve with time,

Editor-in-Chief, MJHS

Professor. Dr. Mohammed HS Al-Turaiki

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ORIGINAL ARTICLE

A study to compare the efficacy of Static stretching and PNF stretching on forward shoulder posture

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Abstract

Introduction: Good posture is that state of muscular and skeletal balance which protects the supporting structures of the body against injury or progressive deformity. Forward shoulder posture is considered as one of the common postural problem in normal asymptomatic young adults. Various stretching techniques and strengthening exercises play a major role to decrease the forward shoulder posture effectively. So this study was intended to find the effectiveness of Static and PNF Stretching along with strengthening techniques on forward shoulder posture. **Method:** Thirty asymptomatic young adults who have forward shoulder posture were selected for this study and divided into two groups. One group received Static and the other group received PNF stretching for a six week stretching along with strengthening Programme, three times per week.

Result: Both static and PNF groups showed improvement in forward shoulder posture and range of motion of both right and left shoulders. **Conclusion:** Although during first two weeks there was no much improvement in forward shoulder posture but from third week onwards PNF group showed marked improvement compared to other group who received static stretching

Key words: Forward shoulder posture, Static stretching, PNF Stretching, Plumb line

الملخص

يعتبر الموقف الأمامي للكتف واحدة من المشاكل الوضعية غير المتناظرة المشتركة العادية في الشباب . الموقف الجيد هو أن حالة من التوازن العضلي والهيكلي العظمي الذي يحمي الهياكل الداعمة للجسم ضد الإصابة أو التشوه التدريجي . تمتد تقنيات وتمارين التقوية المختلفة لتلعب دورا رئيسيا في انخفاض موقف الكتف إلى الأمام على نحو فعال. لذلك كان الغرض من هذه الدراسة هو العثور على فعالية ثابتة تمتد جنبا إلى جنب مع تعزيز التقنيات على موقف الكتف إلى الأمام. الطريقة: تم اختيار ثلاثين حالة للشباب الذين لديهم موقف الكتف إلى الأمام لهذه الدراسة وتقسيمها إلى مجموعتين. مجموعة واحدة ثابتة والمجموعة الأخرى تلقت PNF امتدت لستة أسابيع جنبا إلى جنب مع تعزيز البرنامج، ثلاث مرات في الأسبوع. أظهرت نتيجة المقارنة بين المجموعة الثابتة ومجموعة ال PNF تحسن في موقف الكتف إلى الأمام ونطاق الحركة من كلا الكتفين الأيمن والأيسر لمجموعة ال PNF.

الخلاصة: على الرغم من ان خلال أول أسبوعين لم يكن هناك تحسن كبير في موقف الكتف إلى الأمام ولكن من الأسبوع الثالث أظهرت مجموعة PNF تحسنا ملحوظا مقارنة مع المجموعة الأخرى.

Introduction

Good posture is that state of muscular and skeletal balance which protects the supporting structures of the body against injury or progressive deformity. Sedentary lifestyles, poor postural adaptations, activities like slouching and prolonged flexed postures have reported high incidence of forward shoulder posture^{9,21}. Forward shoulder posture, defined as a sagittal plane or transverse plane scapular resting position change, is theorized to result in adaptive shortening of pectoralis minor muscle by approximating the muscles insertion sites on the coracoid process and ribs.^{12,14} Forward shoulders can be described as abduction and elevation of scapula and forward position of the shoulders, giving an appearance of a hollow chest.^{9, 14} These muscular imbalances have been implicated as contributing factors to upper quarter musculoskeletal dysfunction.^{5,9,14,21} Forward shoulder posture may also cause decreased range of motion of shoulder mainly flexion, elevation, abduction and rotation movements because of muscle length changes and muscular imbalances. Previous researchers have described various techniques to objectively measure posture. Double square device is considered to be accurate in detecting changes in shoulder posture and would be of clinical value. This device is considered to have good reliability compared to other techniques.^{9, 18} Different stretching protocols can be used for therapeutic purpose that helps to improve flexibility. Various types include passive stretching, static stretching and PNF stretching etc. Static

stretching is the most common method used to lengthen the soft tissues. PNF stretching is the advanced forms which can be applied to any tightened muscle to lengthen.²⁶ Hold relax, contract relaxes, agonist contract etc are various forms of PNF stretching. Various studies have demonstrated that various PNF stretching techniques effectively increase flexibility and range of motion. However, there is no consensus on whether one PNF technique is consistently superior to another or whether PNF stretching is more, less or equally effective as static stretching.^{26,27} As both static and PNF stretching methods are effective methods of stretching, this study was intended to compare the efficacy of static stretching and PNF stretching in reducing forward shoulder posture by stretching of pectoralis major and minor followed by a strengthening Programme for a period of 6 weeks.

Material & Method:

METHODOLOGY

This study comprised a 6 week stretching and strengthening Programme, thrice a week. The study included 30 asymptomatic subjects who were willing to participate in the study.

SUBJECTS:

Subjects who were willing to participate in the study were screened and assessed for the presence of forward shoulder posture using a plumb line. After screening, 30 subjects with forward shoulder posture were randomly selected and divided into 2 groups. Each group comprised 15 individuals, static

group consisted of 15 subjects (10 females, 5 males). PNF group consisted of 15 subjects (11 females, 4 males). Ethical clearance was taken from the ethical committee prior to the study. All the subjects were explained about the study and an informed consent was obtained from them.

INCLUSION CRITERIA:

- Asymptomatic male and female subjects of age between 18 to 25 years with forward shoulder posture.

EXCLUSION CRITERIA:

- Subjects with any surgical history to shoulder and cervical spine
- Any past or present history of injuries to shoulder and cervical and thoracic spine
- Elite level athletes or subjects.
- Presence of cervical rib, VBI, impingement syndrome, thoracic outlet syndrome.

MATERIALS USED:

Double square (Model #420 EM, Johnson Level Tool Manufacturing)

Universal goniometer

Thera-bands

Plumb line

OUT COME MEASURES:

- Measurement of forward shoulder posture using double square device
- Measurement of shoulder range of motion using universal goniometer

PROCEDURE:

In this study, subjects were screened for for-

ward shoulder posture and then total members of 30 were divided into 2 groups namely group A (n=15) and group B (n=15) randomly. Group A was assigned with PNF stretch and Group B was assigned with static stretch Programmes and both the groups were given with same exercise programme for 6 weeks. Before starting the exercise Programme and stretching, forward shoulder posture was measured using a double square device by measuring the distance between wall and tip of acromion process of the subject's shoulder (both right and left). Shoulder range of motion (both right and left shoulders) was also measured using universal goniometer. Then both the groups performed same exercise Programme for strengthening, this strengthening Programme is followed by PNF stretch for pectoralis major and minor muscles in Group A and static stretch for pectoralis major and minor in Group B. This Programme was given for 6 weeks, thrice a week.

Forward shoulder posture was measured at the end of every week. Shoulder range of motion was also measured before 6 weeks and after 6 weeks Programme.

MEASUREMENT PROCEDURES:

Measurements of both the right and left shoulder of each subject were taken before and after the 6-week exercise and stretching programme and also at the end of each week. A device known as double square (model 420 EM, Johnson level and tool manufacturing) was used to quantify forward shoulder posture. shoulder range of motion was also measured

before and after 6 week programme using a universal goniometer.

DOUBLE SQUARE DEVICE:

A device known as the double square (Model #420EM, Johnson Level and Tool) was used to quantify forward shoulder posture. The double square consists of a 40-cm combination square with a second square/level added in an inverted position. This device was used to measure the distance (in millimeters) from the wall to the anterior tip of the subject's acromion process. After palpating the anterior tip of the acromion process on the subject's left and right shoulder, the location was marked on the subject's skin with a permanent marker. The subject was then instructed to place his or her heels against the wall and was verbally instructed to "assume an upright, military posture." At this point the double square was positioned over the subject's left shoulder with 1 square flush against the wall. The second square was adjusted until it touched the marked tip of the subject's left acromion. Three measurements were taken and recorded. The exact measurement process was repeated on the subject's right shoulder. The subject was then instructed to relax into his or her normal posture. At this point the entire measurement process was repeated. The military posture was incorporated in order to ensure that participants would not inadvertently alter their relaxed normal posture during the measurement process.

The mean of the 3 posture measurements was used for statistical analysis. For all sub-

jects in both groups, measurements were taken with the same equipment and by the same investigator throughout the study to ensure accuracy and identical instructions.

UNIVERSAL GONIOMETER:

Universal goniometer can be used to measure joint position and range of motion at almost all joints of the body. Universal goniometers may be constructed of metal or plastic. Typically the design includes a body, and two thin extensions called arms- a stationary arm and a moving arm. The body of a universal goniometer resembles a protractor and may form a full or half circle. Measurement scales are located on one or both sides of the body [0 to 360 and 360 – 0 degrees]. After taking the initial shoulder measurements, the subjects in both groups were assigned with a 6 week stretching and strengthening Program. The exercises were conducted 3 times per week.

At first session, the subjects were introduced to different levels of thera bands. These bands are color coded with each color representing a different resistance. The subjects were demonstrated about the exercise procedure. The subjects were given the opportunity to do 5 repetitions of each exercise with several levels of thera-bands in order to estimate which level was appropriate for themselves. The subjects then carried out 3 sets of 10 repetitions of all strengthening exercises.

EXERCISES:

Scapular retraction, External rotation, Shoulder flexion for lower trapezius

Progression of exercises:

WK 1 WK2 WK3 WK4 WK5
WK6

Repetitions: 3*10, 3*15, 3*20** 3*10 3*15,
3*20

At the end of third week the subjects progressed to next higher level of resistance using the thera-band.

PNF STRETCHING:

Group A was assigned with PNF stretching.

PECTORALIS MAJOR STRETCH:

Hold relax technique was used in PNF stretching. By changing the angle of abduction of arm different fibers of pectoralis major can be emphasized .45degrees focuses on clavicular head and 135 degrees focuses more on lower fibers of sterno-costal head. Support the right arm from the elbow to the hand using forearm and hand of one side. Ask the subject to begin slowly to attempt to bring his arm down and across his chest leading with the elbow, isometrically contracting the pectoralis major for 10 seconds. After the isometric push, the subject relaxes and breathes in. On the exhale ask the subject to lift his arm higher, keeping the forearm horizontal and his sternum to the table. This stretch is repeated 3 times bilaterally.

PECTORALIS MINOR STRETCH:

Subject lies supine on the table. Stand at the side to be stretched. Hold subject's hand with one hand allowing his or her upper arm to rest at his or side on the table. Place palm of other hand on subject's anterior shoulder. Direct the subject to pull his or her shoulder towards the

table and his or her shoulder blade down his or her back towards the feet. This lengthens the pectoralis minor to its end range.

STATIC STRETCHING:

Group B was assigned with static stretching.

STATIC STRETCH FOR PECTORALIS MINOR:

Subject placed in supine position on a 5-in diameter foam roll, which runs down the center of the back. Shoulders are grasped and pressed slowly in the direction of floor until instructed to stop and hold for 30 seconds, repeated 3 times per session.

STRETCH FOR PECTORALIS MAJOR:

The subject assumes a kneeling position in front of the therapist. Then subject laced his or her fingers behind the head. Then therapist reached in front of subject's arms and back behind subject's scapulae, lacing his or her fingers together as well. Then therapist pulled in diagonal direction, both up and back from subject's trunk until instructed to stop and hold .The stretchwas held for 30 seconds, repeated 3 times per session.

STATISTICAL ANALYSIS

Statistical techniques play an extremely important role in planning of a good study In this study the analysis of effectiveness of static stretching and PNF stretching was done using ANOVA and t – test.

Initially baselines values were obtained. Mean age and height were calculated. Mean, standard deviation and standard error of the variables were calculated.

For determining the efficiency or change in posture in right and left relaxed posture in both groups ANOVA single factor was done.

For comparing the efficiency of reducing forward shoulder posture in static and PNF groups, t – test was used individually in right and left relaxed postures.

For comparing the efficiency in improvement of right and left shoulder flexion, abduction and external rotation between static and PNF

groups, t- test was applied.

RESULTS:

Before starting of exercise and stretching Programme base line values of age, height, forward shoulder posture right and left, range of motion of right and left shoulders of both PNF and static group were taken. Mean, standard deviation, standard error were calculated to compare the baseline values.

(Table 1) Intra group comparison of right forward shoulder posture from 0 to 6 weeks of PNF group was done by applying ANOVA to know the significant change in forward shoulder posture .The result showed significant change in forward shoulder posture with mean score of 0.30.

VARIABLE	PNF GROUP			STATIC GROUP		
	MEAN	SD	SE	MEAN	SD	SE
AGE						
HEIGHT	22.4	1.05	0.27	22.9	1.10	0.28
FSP RIGHT	5.36	0.29	0.07	5.39	0.28	0.07
FSP LEFT	13.51	0.59	0.15	13.65	0.34	0.08
RIGHT FLEXION	13.27	0.47	0.12	13.45	0.32	0.08
RIGHT ABDUCTION	163.9	7.2	1.8	161.9	7.5	1.9
RIGHT E R	154.1	6.6	1.7	155.2	6.2	1.6
LEFT FLEXION	79.33	6.5	1.68	69.00	5.3	1.39
LEFT ABD	165.0	5.6	1.4	163.0	4.5	1.1
LEFT E R	158.2	4.6	1.1	155.0	5.3	1.3

(Table 2) Intra group comparison of left forward shoulder posture from 0 to 6 weeks of PNF group was done by applying ANOVA to know the significant change in forward shoulder posture. The result showed significant change in forward shoulder posture with mean score of 0.23.

Source of Variation	SS	df	MS	F-Cal	P-value	F-tab
Between Groups	223.5	6	37.249	122.602	2.77E-43	2.193
Within Groups	29.775	98	0.304			
Total	253.27	104				

(Table 3) Intra group comparison of right forward shoulder posture from 0 to 6 weeks of static group was done by applying ANOVA to know the significant change in forward shoulder posture. The result showed significant change in forward shoulder posture

Source of Variation	SS	df	MS	F-Cal	P-value	F-tab
Between Groups	226.41	6	37.734	163.830	8.66E-49	2.193
Within Groups	22.572	98	0.230			
Total	248.98	104				

(Table 4) Intra group comparison of left forward shoulder posture from 0 to 6 weeks of static group was done by applying ANOVA to know the significant change in forward shoulder posture. The result showed significant change in forward shoulder posture

Source of Variation	SS	df	MS	F-Cal	P-value	F-tab
Between Groups	49.701	6	8.283	44.411	7.74E-26	2.193
Within Groups	18.279	98	0.187			
Total	67.98	104				

(Table 5) Means of right forward shoulder posture from 0 to 6 weeks of PNF and static groups were compared and *t* – test was done to compare the significance. And results showed that PNF was effective

Source of Variation	SS	df	MS	F-Cal	P-value	F-tab
Between Groups	41.642	6	6.940	45.000	4.86E-26	2.193
Within Groups	15.115	98	0.154			
Total	56.757	104				

(Table 6) Means of left forward shoulder posture from 0 to 6 weeks of PNF and static groups were compared and *t* – test was done to compare the significance. Results showed that PNF Group is more effective.

	GroupA	GroupB
Mean	11.9676	12.9219
Variance	0.26479	0.17186
Observations	15	15
SD	0.51	0.41
SE	0.13	0.10
df	28	
t-calculated	-5.59312	
P - Value	3.1E-06	
t - tabulated	1.70329	

(Table 7) Inter group comparison of right flexion between PNF and static groups was done by applying t- test to know the significance and showed the PNF Group is more effective.

	GroupA	GroupB
Mean	11.804	12.757
Variance	0.199	0.135
Observations	15	15
SD	0.44	0.36
SE	0.11	0.09
df	28	
t-calculated	-6.383	
P - Value	3.9E-07	
t -tabulated	1.703	

(Table 8). nter group comparison of right abduction between PNF and a static group was done by applying t- test to know the significance. Results showed PNF Group is more effective.

	PNF	STATIC
Mean	176.2	167
Variance	15.1714	51.2857
Observations	15	15
SD	3.8	7.1
SE	1.0	1.8
df	28	
t-calculated	4.3708	
P - Value	0.0001	
t -tabulated	1.7171	

(Table 9) Inter group comparison of right external rotation between PNF and static groups was done by applying t- test to know the significance. Results showed that PNF Group is more effective.

	PNF	STATIC
Mean	173	161.267
Variance	13.571	36.781
Observations	15	15
SD	3.68	6.06
SE	0.95	1.56
df	28	
t-calculated	6.4041	
P - Value	8E-07	
t -tabulated	1.7139	

(Table 10) Inter group comparison of left flexion between PNF and static groups was done by applying t- test

	PNF	STATIC
Mean	79.333	69
Variance	42.381	29.1429
Observations	15	15
SD	6.51	5.39
SE	1.68	1.39
df	28	
t-calculated	4.7322	
P - Value	3E-05	
t -tabulated	1.7033	

(Table 11). nter group comparison of Post values of left abduction between PNF and static groups was done by applying t-test

	PNF	STATIC
Mean	176.6667	168.5333
Variance	13.0952	15.8381
Observations	15	15
SD	3.61	3.98
SE	0.93	1.02
df	28	
t-calculated	5.8562	
P - Value	1.34831E-06	
t -tabulated	1.7011	

(Table 12) Inter group comparison of post values of left external rotation between PNF and static groups was done by applying- test

	PNF	STATIC
Mean	174.6667	160.8667
Variance	8.8095	26.9810
Observations	15	15
SD	2.96	5.19
SE	0.76	1.34
df	28	
t-calculated	8.9339	
P - Value	4.5E-09	
t -tabulated	1.7171	

DISCUSSION

This study was done to compare the efficiency of static stretching and PNF stretching in reducing forward shoulder posture and increase in range of motion of shoulder. Forward shoulder posture was measured using a double square device in both military posture and relaxed posture. Only relaxed posture was documented for statistical analysis. Range of motion of both right and left shoulders was also measured using a universal goniometer. On analysis of pre and post values of forward shoulder posture measurement and range of motion of both right and left shoulders, graphical representation showed marked improvement in posture and range of motion of both right and left shoulders in PNF group more than in static group. Static group showed significant change in forward shoulder posture both in right and left shoulders with p-value of $7.74E-26$ (for right) and $4.86E-26$ (for left) at 0.05 level of significance. This is supported by the study done by Mark Kluemper et al (2006) in which static stretching and strengthening Program was given for 6 weeks, thrice a week in competitive swimmers which showed a significant improvement in their forward shoulder posture. Static stretching involves a continuous sustained stretch lasting 6 to 30 sec which is sufficient time for the golgi-tendon organ (GTO) to respond to increase in tension. The impulses from GTO can override the impulses coming from the muscle spindles, allowing the muscle to reflexively relax after the initial reflex resistance to the change in length and

helps in lengthening the muscle. Also there is less danger of extensibility limits of the involved joints because the stretch is more controlled (De Wries, K, 1986). PNF group also showed significant change in both right and left forward shoulder posture with p-values of $2.77E-43$ (for right) and $8.66E-49$ (for left) at 0.05 level of significance. When static group and PNF group was compared, both right and left shoulders in relaxed posture, PNF group showed more effectiveness than static group in reducing forward shoulder posture i.e. individuals showed lesser distance of acromion tip to the wall by the end of 6 weeks. PNF group showed more effectiveness with p-value $3.1E-06$ for right and p-value $3.9E-07$ for left shoulders at 0.05 level of significance. PNF group also showed marked improvement in both right and left shoulder flexion, abduction and external rotation when compared to static group. In hold relax procedure, the range limiting shortened muscle is first lengthened to the point of limitation or to the extent that is comfortable for the subject. The subject then performs an isometric contraction for up to 10 sec followed by voluntary relaxation of the tight muscle. Then the limb is passively moved into the new range as the range limiting muscle is elongated (Carolyn Kisser 4thed). The rationale behind this technique is that after isometric contraction there is a brief period during which the muscle is reflexively relaxed and therefore can be easily stretched. The push phase causes an increase in tension that stimulates Golgi tendon organ to affect a reflex relaxation of the antagonist even before

the muscle is placed in a position of stretch. This relaxation of antagonist muscle during contractions is referred to as autogenic inhibition. During the relaxing phase the antagonist is relaxed and passively stretched while there is a maximal isotonic contraction of the agonist muscle putting the extremity further into agonist pattern. In any synergistic muscle group a contraction of agonist causes a reflex relaxation in antagonist muscle, allowing it to stretch and protects it from injury. This phenomenon is referred to as reciprocal inhibition. Additive effects of autogenic and reciprocal inhibition of PNF stretching technique allowed the muscle to be stretched to a greater degree than is possible with static stretching and improved the flexibility and range of motion, which supports this study. It is believed that when muscle fibers are reflexively inhibited through autogenic or reciprocal inhibition, there is less resistance to elongation by the contractile elements of the muscle (Robert McAtee , Carolyn Kisner).The results showing more efficacy in PNF group is supported by the study done by Sady et al who conducted a study on 40 college men by using different stretching techniques to find out the flexibility of shoulder, trunk, and hamstrings and reviewed that PNF stretching may be the preferred technique when compared to static and ballistic stretching. Daniel C Funk et al, in his study demonstrated more efficiency of PNF stretching than static stretching in hamstrings muscle, which supports the study. As stated by Worrel T W (Sullivan MK, 1994), PNF produced greater increases in range of

motion than static stretching. The exercise Programme followed in this study was appropriate protocol based on the work of Klumper et al and Wang et al whose studies showed marked improvement in strengthening of the weakened muscle. The exercise progression, followed in this study was based on the work of Wang et al in which a similar protocol produced significant strength gains. As stated by Kendall and other researchers, the tightened muscles also get weakened, hold relax technique used in PNF group helps in strengthening of the tightened muscles. Although strength of muscle was not quantified or measured, reduction in the distance from acromion tip to the wall shows indirect consequence of improvement in strength of the muscle. The results of this study have shown significant improvement in PNF group. On observing the forward shoulder measurement values in both right and left shoulders from 0 to 6 weeks, there was not much difference in the values in the initial 2 weeks, but marked significance was observed from 4th week although improvement started from 3rd week onwards. Change of next level of resistance from 3rd week of the study in every individual also shows change in strength of the muscles based on work of Wang et al. On comparing PNF and static groups, PNF group showed marked improvement in forward shoulder posture and range of motion of both right and left shoulders.

CONCLUSION: Both static and PNF groups showed improvement in forward shoulder posture and range of motion of both right

and left shoulders. Although during first two weeks there was no much improvement in forward shoulder posture, from third week onwards PNF group showed marked improvement compared to other group.

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ORIGINAL ARTICLE

Prevalence and risk factors of Metabolic Syndrome (MetS) in Primary Health Care Centers' Attendants in Majmaah, Saudi Arabia

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Abstract

Background: Metabolic syndrome (MetS) is a cluster of established cardiovascular risk factors that collectively increase predisposition to major chronic diseases, including heart diseases and diabetes mellitus. Population of Saudi Arabia is at risk for MetS as a result of industrialization and change in life style. The objectives of the current study were to determine the prevalence of metabolic syndrome in Majmaah area, to estimate its risk factors and to determine the relation between metabolic syndrome and the social factors.

Methodology: The study was a cross-sectional and facility-based conducted in Majmaah city in Saudi Arabia. The sample size was calculated as 353. The data was collected by a pre-tested questionnaire. Weight, height and abdominal circumference were measured. Fasting blood samples were collected to ascertain fasting blood glucose and lipid profile. Components of full MetS as defined by the NCEP-ATP- III criteria were used for screening.

Results: The prevalence of MetS among adults attending Primary Health Care Centers in Majmaah was 44.5%. MetS was significantly higher in males than in females (61.2 vs. 38.8%; $P = 0.001$). Prevalence of MetS showed an increase trend with age from 20 years to 59 years, and inversely with educational status (illiterates 27% and university graduates 14.6%). MetS was associated with occupation; the housewives showed the highest prevalence of the syndrome followed by the government employees (36.3% and 34.3% respectively).

Conclusions: Majmaah adult population has high prevalence of metabolic syndrome. Metabolic Syndrome is more prevalent among males, the low educated, the old age groups, the low income as well as among the employees and the housewives..

Keywords: Metabolic Syndrome, Prevalence

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الملخص

خلفية: متلازمة الأيض هي مجموعة من عوامل الخطر القلبية الوعائية والتي تؤدي في مجملها للإصابة بالأمراض المزمنة الرئيسية، بما في ذلك أمراض القلب وداء السكري. لدى السكان بالمملكة العربية السعودية زيادة في معدل الإصابة بمتلازمة الأيض نتيجة للعولمة وتغيير نمط الحياة. الهدف من الدراسة الحالية هو تحديد مدى انتشار متلازمة الأيض في منطقة المجمعة وتحديد عوامل الخطر بالإضافة إلى تحديد العلاقة بين متلازمة الأيض والعوامل الاجتماعية. منهجية الدراسة: هذه دراسة مقطعية أجريت في مدينة المجمعة بالمملكة العربية السعودية. تم حساب حجم العينة لتبلغ ثلاثمائة وثلاثة وخمسين. تم جمع البيانات عن طريق الاستبيان وتم قياس الوزن والطول ومحيط البطن. تم جمع عينات الدم لقياس سكر عند الصيام وتحديد نسبة الدهون. ولتعريف مصطلح الأيض استخدمت مكونات متلازمة الأيض الكاملة على النحو الذي تحدده معايير البرنامج التعليمي الوطني للدهون - مجموعة علاج الكبار رقم ٣.

النتائج: معدل انتشار متلازمة الأيض بين البالغين الذين يترددون على مراكز الرعاية الصحية الأولية في المجمعة هو ٤٤,٥٪. أظهرت الدراسة أن معدل انتشار المتلازمة أعلى بين الذكور مقارنة بالاناث (٦١,٢٪ مقابل ٣٨,٨٪). يزداد معدل انتشار المتلازمة مع التقدم في العمر من ٢٠ إلى ٥٩ عاماً، وعكسياً مع المستوى التعليمي (الأميين ٢٧٪ وخرجي الجامعات ١٤,٦٪). ارتبطت متلازمة الأيض بنوع الوظيفة إذ أظهرت الدراسة أن لدى ربات البيوت أعلى نسبة انتشار للمتلازمة يليهن موظفي الحكومة (٣٦,٣٪ و ٣٤,٣٪) على التوالي. الخلاصة: خلصت الدراسة إلى أن هنالك ارتفاع في معدل انتشار متلازمة الأيض بين سكان المجمعة البالغين. متلازمة الأيض هي أكثر انتشاراً بين الذكور، وذوي المستوى التعليمي الأدنى، والأكبر سناً، وذوي الدخل المنخفض بالإضافة إلى الموظفين وربات البيوت.

Introduction:

Metabolic syndrome is a combination of the medical disorders that a high blood sugar level, excess body fat around the waist, increased blood pressure and abnormal cholesterol levels — that occur together, increasing risk of diabetes, stroke and heart disease. Having just one of these conditions doesn't mean you have metabolic syndrome. However, any of these conditions increase risk of serious disease. If more than one of these conditions occurs in combination, risk is even greater¹. The US National Cholesterol Education Program Adult Treatment Panel III (2001) requires at least three of the following: Fasting plasma glucose ≥ 6.1 mmol/L (110 mg/dl), Blood pressure $\geq 130/85$ mmHg (or treated for hypertension), central obesity:

waist circumference ≥ 102 cm or 40 inches (male), ≥ 88 cm or 35 inches (female). Dyslipidemia: TG ≥ 1.7 mmol/L (150 mg/dl). Dyslipidemia: HDL-C < 40 mg/dL (male), < 50 mg/dL (female)².

Different studies on prevalence of metabolic syndrome showed different results; In the United States, an age-adjusted prevalence of 23.9% was found using the data from a nationally representative sample of American citizens derived from a cross-sectional health survey². The prevalence was found as 20.7% among Irish middle-aged men and women³. In a study conducted among Arab Americans, the prevalence was found as 23%⁴. In a large multi-ethnic cohort study of the US population, the overall prevalence of the syndrome was found as 24% in the

general population, with an inter-ethnic variation of 21-31%⁵. In a study conducted in Oman to determine the prevalence of the Metabolic Syndrome among Omani adults the prevalence was found as 21%⁶. Using the WHO definition of metabolic syndrome, a prevalence of 17% among the Palestinians in the West Bank was found⁷.

In Saudi Arabia, the prevalence of metabolic syndrome among Qassim University personnel was 31.4%¹ and of 20.8% among military personnel in the kingdom⁸, 39.3% and age-adjusted prevalence of 39.3%⁹. In a recent study conducted at national level the prevalence of MetS was 28.3%¹⁰.

Metabolic syndrome increased with age but increases even more dramatically as BMI increases. The prevalence of metabolic syndrome varied by race and ethnicity but the pattern was different for males and females¹¹. In a study conducted among Qassim University Personnel in Saudi Arabia the prevalence showed a steady increase with increasing age, BMI and serum cholesterol. General obesity measured by BMI was the most common component of the syndrome where 75% of participants suffered from overweight and obesity. Dyslipidemia was also very common. Participants with high-density lipoprotein below protective level constituted 73.6%, while those with total cholesterol and triglyceride above clinically normal level constituted 60.0% and 46.4% respectively. Fasting plasma glucose and hypertension was the least common. Older

individuals and those with higher BMIs were found to have a higher concentration of the factors. This observation was evident across all groups of participants whether having one or more factors¹.

The objectives of the current study were to determine the prevalence of metabolic syndrome in Majmaah area, to estimate its risk factors and to determine the relation between metabolic syndrome and the social factors.

Materials and methods:

The current study was an observational, cross-sectional and facility-based study to determine the prevalence of metabolic syndrome in Majmaah area. The duration of the study was one year from September 2013 and October 2014. The study was conducted in Majmaah city, which is located in Majmaah province, Riyadh area in Saudi Arabia. The city has a population of about 45,000. The study population was Saudi adults 20-70 years of age attending selected primary health care centers in Majmaah for any reason. Non Saudi residents and pregnant women were excluded from this study. The sample frame was the primary health care centers and the patients visiting these centers in Majmaah city. The health centers which selected by simple random sampling were Alfaha, Almajmaah, Hai Almataar, Al Yarmook and Alfaisilia. The sample size was calculate as 336 taken as 353¹¹. Systemic sampling was used for selection of respondents within the selected health centers.

The data were collected through a pre-tested questionnaire. The questionnaire included socio demographic factors (age, gender, occupation, residence, income and marital status), clinical examination and laboratory investigations. The clinical examination included Body Mass Index (BMI), assessment of arterial blood pressure and measuring waist circumference. Weight was measured by a weighing machine (DETECTO, made in USA). The weighing machine was placed over a straight floor and is set at Zero and checked after each patient to guarantee that it is in its place. The participants were weighed while dressed in light clothes. The same machine was used all over the study and for all participants. The reading was taken by a kilogram to one decimal. The height was measured by a full length stadiometer. The participants stood straight and looking forward while their heels were against the stadiometer pole. Participants' height was measured without shoes and head covers. The upper pole of the machine was placed over the head without pressure and measurements were taken by centimeter to the nearest one decimal. The BMI was calculated according to the following formula: $BMI = \text{weight (kg)} / \text{height (m)}^2$. The waist circumference was measured by using a measuring tape while the participant is standing erect and had relaxed the abdominal muscles. Measuring point was between the iliac crest and the lower rib. The position of the tape measure was positioned horizontally, parallel to the floor. The measurements were recorded by the centimeter to one decimal.

The blood pressure was measured by using sphygmomanometer. A properly sized blood pressure cuff was used. The cuff was rapped around the upper arm with the cuff's lower edge one inch above the antecubital fossa. The measurement was taken when the participant was sitting down. The stethoscope's bell was lightly pressed over the brachial artery just below the cuff's edge. The cuff was rapidly inflated to 180 mmHg. Release air from the cuff at a moderate rate (3mm/sec). The first knocking sound (Korotkoff) was the subject's systolic pressure. When the knocking sound disappears the measurement is recorded as a diastolic pressure.

The laboratory investigations were measured by a laboratory specialist by using the same machine for all the samples. Tests included total cholesterol, HDL cholesterol, LDL, triglycerides, and fasting glucose. Total cholesterol, HDL cholesterol, and triglycerides were enzymatically measured. Cholesterol was calculated using Friedwald's formula [$LDL \text{ cholesterol} = \text{total cholesterol} - (\text{HDL cholesterol} + \text{triglyceride}/5)$] for triglyceride levels $<400 \text{ mg/dl}$. Diabetes was defined as fasting glucose $\geq 126 \text{ mg/dl}$ or glycemic levels 2 h after a 75-g oral glucose load $\geq 200 \text{ mg/dl}$ ¹².

The data was analyzed by using SPSS (version 22) software. The data was validated by the mechanism of double entry that SPSS software offers. The two files were double entered, and the original file was matched by the statistician to reduce the errors.

The study was approved by the Ethics Committee of the Basic and Health Science Research Center, Majmaah University. A written consent was obtained from all respondents.

Results:

Table (1) shows the distribution of MetS according to subjects' socio demographic characteristics. MetS was significantly higher in males than females (61.1% versus 38.9%). MetS prevalence was higher among older age group up to 59 years of age. Prevalence of MetS among the age groups 20-29, 30-39, 40-49 and 50-59 constituted 5.7%, 13.4%, 30.6% and 33.1% respectively. Regarding the relation of MetS with the educational level, results showed that MetS among the illiterates was 27.4%. MetS among the primary, intermediate, secondary and university educated was 17.8%, 21.7%, 18.5% and 14.6% respectively.

The government employees and the house-wives had the higher prevalence of MetS (42% and 36.3%). Regarding the relation between MetS and the participants' monthly income it was shown that the prevalence of the disease among those with low income was 52.2%. MetS among those with moderate, high and very high income constituted 26.8%, 18.5% and 2.5% respectively.

Table 1. Distribution of MetS among participants according to Demographic characteristics (n =353)

Characteristics	Population	MetS	X ²	p
Gender				
Male	(44.5%) 157	(61.1%)96	24.522 ^a	0.001
Female	(61.2%) 196	(38.9%)61		
(Age group(years)				
20-29	(15.6%)55	(5.7%)9	27.599	0.001
30-39	(15.3%)54	(13.4%)21		
40-49	(28.9%)102	(30.6%)48		
50-59	(28.3%)100	(33.1%)52		
60-69	(6.8%)24	(9.6%)15		
70	(5.1%)18	(7.1%)12		
Education				
Illiterate	(26.3%)93	(27.4%)43	21.114	0.001
Primary	(18.1%)64	(17.8%)28		
Intermediate	(15.0%)53	(21.7%)34		
Secondary	(15.9%)56	(18.5%)29		
University and Above	(24.6%)87	(14.6%)23		
Occupation				
Government Employee	(34.3%)121	(42.0%)66	27.246	0.001
Private employee	(3.4%)12	(1.9%)3		
Business	(2.8%)10	(4.5%)7		
Military	(2.0%)7	(1.9%)3		
House wives	(41.9%)148	(36.3%)57		
Student	(8.2%)29	(2.5%)4		
Others	(7.4%)26	(10.8%)17		
Monthly income/SR				
(Low (< 5000	(46.7%)165	(52.2%)82	4.361	0.001
Moderate ((5000 - 10,000	(28.3%)100	(26.8%)42		
High (10,001 - (15,000	(22.7%)80	(18.5%)29		
V. high (> (15,000	(2.3%)8	(2.5%)4		

Table 2. Univariate regression analysis of selected habits As risk factors for MetS

Habit	Total	Met S	X ²	P		
Performing regular exercise						
Yes	(25.5%)90	(24.8%)39	X ²	P		
No	(74.5%)263	(75.2%)118				
			0.064	0.449		
Ever smoking						
Yes	(9.9%)35	(10.8%)17	X ²	P		
No	(90.1%)318	(89.2%)140				
			0.264	0.607		
Fat diet consumption						
High	(35.4%)125	(44.8%)64	X ²	P		
Low	(29.2%)103	(31.5%)45				
			6.773	0.079		
Carbohydrates diet consumption						
High	(14.2%)50	(15.4%)22				
Low	(21.2%)25	(8.4%)12				

Table (2) shows the univariate regression analysis between certain habits and the risk of MetS. The prevalence of MetS among those who perform physical exercise was 24.8% compared to 75.2% among those who didn't perform physical exercise. The prevalence of MetS among subjects who never smoked was 89.2% compared to 10.8% among those who ever smoked. Results showed that 44.8% of the subjects who consumed high fatty food had MetS while 31.5% of those who consume low fatty food contracted the disease. Regarding consumption of carbohydrate diet, 15.4% and 8.4% of those who consume high and low carbohydrate diet had MetS but the relation was not significant.

Discussion:

The prevalence of (MetS) in Majmaah adults in Saudi Arabia, utilizing ATP III criteria, was 44.5%. This finding is comparable to other national and regional studies¹³⁻²². MetS

affects approximately one-quarter of adults in many developed countries^{23, 24}. It represents a group of risk factors that are linked to the accelerated development of atherosclerosis and CVD. Though the exact pathogenesis is not known, many risk factors have been identified²⁵. The significant risk factors identified by our study included male gender, increasing age, low education, low income, government employee and housewives (p= 0.001). The prevalence of MetS was higher with male gender compared to females. The syndrome was also associated with increase age until 59 years; these findings were consistent with other studies^{14, 26, 27, 28}.

The low educated were at increased risk of MetS according to this study. Many studies reported a higher prevalence of MetS among the less educated subjects. Our findings are in agreement with the findings of these studies^{34, 35, 36, 37}. We found that subjects with low income had higher prevalence of MetS. Studies in other countries showed no

association of income with MetS^{36, 38, 39, 40}. Those with low income may have limited choices regarding their diet. Low education may also play a role in this. Occupation was significantly associated with MetS in this study in which prevalence rates among housewives and government employees were higher. Other studies reported significant association of MetS with the occupation, but there was no consistency with the nature of the occupations, in an Indian industrial setup to study disparity in occurrence of MetS in a working population based on occupational status found that 19% of the non-manual workers and 18.3% of the manual workers suffered from MetS, and the single largest occupational category with MetS included the managers and senior officials⁴¹. MetS prevalence is considered to be high among Jordanian employees⁴².

In this study those who don't perform regular physical exercise had more prevalence of MetS but the relation was not significant (0.449). Poor lifestyle practices, including lack or absence regular physical exercise is significantly associated with MetS in this study, which was in accordance with many studies²⁹⁻³³. Physical inactivity is strongly and inversely associated with MetS, which reduces with weight loss and regular physical activity^{33, 34}.

In our study the nonsmoker has high prevalence of Mets and the relation is not significant. This is consistent with other studies; MetS has been significantly associated with smoking in some studies.

Smoking was associated with MetS despite the fact that smokers may have lower BMI than nonsmokers³⁴. The high prevalence of Mets in this study can be explained by the fact that most of our subjects were females who disclose their smoking status in a semi urban community where smoking female is considered unacceptable. In this study respondents who consume high fat and carbohydrate diet had high prevalence of MetS but results didn't show statistical significance. This may be explained through high prevalence of obesity and diabetes among those who consume high fat and carbohydrate diet.

Conclusion:

Majmaah adult population has high prevalence of metabolic syndrome, almost the same prevalence of metabolic syndrome like what was found in other areas of Saudi Arabia. Metabolic Syndrome is more prevalent among males, the low educated, the old age groups, the low income as well as among employees and housewives. Despite accumulating evidence of an epidemic, major policies are advised to be adopted and campaigns launched to control and prevent MetS among Saudi population.

Authors' contribution:

All of the authors contributed equally in this work.

Conflicts of interest:

The authors have no conflict of interest to declare.

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The Impact of Custom Made Insoles on the Plantar Pressure of Diabetic Foot

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Abstract

Diabetes mellitus is a common disease that effect many organs of the body and can also cause serious adverse effect on the foot. Diabetic foot complications range from atrophy and weakness of foot intrinsic muscles, abnormal walking pattern, neuropathy and foot ulcers. Severe cases of diabetic foot ulcers can result in amputation. Custom-made insoles are one of the foot care recommendations for patients with diabetic foot, as they help to distribute the plantar pressure and reduce the risk of ulceration.

The objective of this study is to examine the impact of custom made insoles on the plantar pressure in 64 diabetic subjects (32 females and 32 males without any foot ulceration) by comparing the peak plantar pressure during bare foot walking with that while using custom made insoles.

The statistical analyses indicate a significant impact of custom made insoles on the plantar pressure of both female and male subjects. The female subjects showed 84.7% and 84.5% reduction in the right and left foot average peak plantar pressure respectively, and the male subjects experienced a reduction of 77.6% and 76.5% in the average peak plantar pressure of the right and left foot, respectively. Custom made insoles can reduce the plantar pressure of diabetic foot and thus, can reduce the risk of diabetic foot ulcers related to uneven distribution of plantar pressure.

Keywords: Plantar Pressure, Custom made insoles, diabetic foot

الملخص

يعتبر مرض السكري احد الأمراض الشائعة وله تاثير على العديد من اعضاء الجسم. لمرض السكري تاثير بالغ على القدم حيث تتباين مشاكل القدم السكرية من ضمور وضعف العضلات الداخلية ، وخلل في المشي ، والإعتلال العصبي ، وتقرحات في القدم قد تؤدي إلى البتر. قد تؤدي تقرحات القدم السكرية الحادة إلى البتر. تعتبر الحشوات الطبية من احد اهم نصائح التوعية الصحية بالقدم السكرية ، حيث انها تساعد على إعادة توزيع ضغط الوزن على باطن القدم مما يساهم في خفض نسبة خطر الإصابة بتقرحات القدم السكرية.

تهدف هذه الدراسة إلى دراسة أثر الحشوات الطبية المصنعة خصيصا للمريض على ضغط الوزن على باطن القدم على 64 عينة من مرضى السكري (32 امرأة و 32 رجل ممن ليس لديهم تقرحات بالقدم) من خلال مقارنة ضغط الوزن على باطن القدم خلال المشي حافي القدمين مع الضغط على باطن القدم خلال المشي باستخدام الحشوات الطبية المصنعة خصيصا لكل شخص.

أكدت التحاليل الإحصائية وجود علاقة وتأثير قوي للحشوات الطبية على ضغط الوزن على باطن القدم لدى العينتين من النساء والرجال ، حيث ساهمت الحشوات الطبية في خفض متوسط ضغط الوزن على باطن القدم لدى النساء بنسبة 84.7% في القدم اليمنى و 84.5% في القدم اليسرى في حين كانت النسبة لدى الرجال 77.6% في القدم اليمنى و 76.5% في القدم اليسرى.

قد تساعد الحشوات الطبية على خفض ضغط الوزن على باطن القدم السكرية والذي سيساهم في خفض خطر الإصابة بتقرحات القدم السكرية الناتج من الخلل في توزيع الضغط على باطن القدم

الكلمات الدلالية: ضغط الوزن على باطن القدم ، الحشوات الطبية المصنعة خصيصا للمريض ، القدم السكرية

Introduction

Diabetes mellitus is a common disease that can develop either from the lack of insulin production in the body or due to the body's insulin inability to perform its normal function. Diabetes Mellitus affects approximately 15% of the population over the age of 65 in developed countries¹. Twenty to fifty percent of individuals with diabetes of more than 10 years will have symmetrical distal sensory neuropathy resulting in impaired sensation in lower extremity². This can lead to abnormal weight bearing pattern on the planter surface of the foot, which in the long run can result in ulceration³. Foot constitutes 5% of the body surface, supports 95% of the body weight and absorbs the ground impact force during gait^{4,5}. Neuropathic ulcerations result from repetitive stress over areas of high pressure on the planter surface of the foot⁶. Foot ulceration is the most common cause of amputation in diabetic patients⁷. It has been reported that 85% of diabetes related lower extremity amputations are preceded by ulceration⁸. An increased dynamic foot pressure is among the identified risk factors in the formation of diabetic foot ulcer⁹⁻¹⁶. Foot care and proper shoes are the initial standard treatment protocol for diabetic feet at risk¹⁷.

Diabetic neuropathy usually leads to a biomechanical abnormalities resulting in abnormal plantar foot pressure¹⁸. The risk of foot ulcer increases in patients who have a combination of foot deformity and neuropathy¹⁸. Most of the foot ulcers and injuries occur through a foot deformity such

as prominent metatarsal heads or clawed toes subjected to repetitive elevated plantar pressure and shear stress in the presence of neuropathy¹⁹. Foot pathologies can alter foot function, resulting impaired gait during daily activity, and severely affecting quality of life¹⁸. These pathologies are usually painful due to high or abnormal plantar pressure, which can causes asymmetrical pressure distribution between the two feet²⁰. Motor neuropathy affects the muscles, causing abnormal force distribution during walking resulting reactive thickening of skin (callus) at sites of abnormal load, the callus leads to breakdown of skin and subcutaneous tissue, resulting in a neuropathic ulcer¹⁸. The risk of a diabetic person developing a foot ulcer is as high as 25%¹⁷.

Objective

The objective of this study is to assess the impact of custom made insoles on the plantar pressure of diabetic subjects without any foot ulceration.

Methodology

A total of 64 diabetic subjects (32 female subjects; age 50.5 ± 13.26 years, weight 76.79 ± 15.6 kg) and 32 male subjects; age 45.84 ± 10.88 years, weight 87.14 ± 18.73 kg) participated in this study. They were randomly selected from Albusmah Center (Riyadh, Saudi Arabia). Each subject provided an informed consent.

Procedures

Each subject's height and weight (without shoes & socks and in light clothing) was measured using mechanical scale. Dynamic plantar pressure, force, and contact area were measured using a portable platform NOVEL E-med ST (2 sensors / cm²), as shown in Figure 1. While looking straight, the subjects were asked to walk in a straight line without targeting the pressure platform. Each subject stepped onto the pressure platform with their first step landing in the centre of the pressure platform and to ensure repeatability, continued to walk for 10 steps (5 steps each foot "Right and Left"). Each subject was fitted with a custom made insoles, especially designed after detailed assessment of her/his plantar pressure profile and foot biomechanics. Later in shoe plantar pressure was measured for each subject while walking with custom made insoles using Pedar Inshoe System, as shown in Figure 2.

Data analysis

Descriptive analysis was done to calculate mean and standard deviation. Paired t-test was used to compare the plantar pressure during barefoot and while using custom made insoles. In addition, regression analysis was performed for estimating the relationships among the studied variables. Level of significance was taken at $p < 0.05$.

Results

Dynamic peak plantar pressure of 32 female and 32 male diabetic subjects was

obtained for both (bare foot and insole measurements), and was analysed, as shown in Table 1. The average peak plantar pressure significantly decreased when using custom made insoles compared to bare foot. For the female subjects, the average peak plantar pressure of the right foot when walking bare foot was 640.26 Kpa. Whereas the corresponding value while walking with custom made insoles was 98.22 Kpa. Thus, there was 84.7% reduction in the average peak plantar pressure with the use of custom made insoles. Similarly, the left foot average peak plantar pressure dropped from 671.82 Kpa when walking bare foot to 104.4 Kpa while using the custom made insoles (84.5% reduction). The male subjects showed less reduction than those of females. The right foot average peak plantar pressure when walking bare foot was reduced from 621.56 Kpa to 139.52 Kpa when walking using custom made insoles (77.6% reduction), and left foot average peak plantar pressure dropped from 555.47 Kpa when walking bare foot to 130.38 Kpa while using the custom made insoles (76.5% reduction), as shown in Table 2.

Figure 3, 4, 5, and 6 showed a comparison of peak plantar pressure during barefoot and using custom made insoles, for all female (n=32) and male (n=32) subjects. The results clearly showed a consistency in the reduction of plantar pressure when using custom made insoles for all subjects. Results of paired samples t-test indicated highly significant relationship between the peak plantar pressure when walking bare foot and the peak plantar

pressure when walking using custom made insoles. Table 3 showed the summary output of the statistical analysis for male subjects showing a p-value of 0.0019, similarly Table 4 showed the summary output of the statistical analysis for female subjects which indicate a p-value of 0.0316. This clearly demonstrates a strong positive relation between the uses of custom made insoles and reduction in the peak plantar pressure.

Discussion

Neuropathy is one of the serious complications of diabetic foot, resulting in the loss of sensory feedback¹⁸. In this study, the impact of custom made insoles on the plantar pressure of diabetic female and male subjects was examined, by analysing the dynamic peak plantar pressure when walking bare foot and also walking with custom made insoles. The statistical analysis indicated a strong significant impact of custom made insoles on the plantar pressure of both female and male subjects. There was a significant reduction

in the peak plantar pressure for both female and male subject, which constitutes 84.7% and 84.5 % for female right and left foot respectively. Similarly for the male subjects, the corresponding values for the right and left foot were 77.6% and 76.5%, respectively.

The results in the present study were in agreement with previous studies. Jung et al.²¹ reported significantly increased contacting foot surfaces and significantly reduced highest peak pressure and the mean pressure when insole was used. Similarly, Chen et al.²² reported that the total contact insoles was able to reduce high pressures at regions such as heel and metatarsal heads and can redistribute the pressure to the midfoot region. In addition, Choi et al.²³ reported that the plantar foot pressure concentrated in certain parts was reduced by custom-made insoles. Furthermore, Bus et al.²⁴ reported that the custom-made insoles were more effective compared to flat insoles in reducing the pressure at first metatarsal head region.

In conclusion, custom made insoles help

Table 1: Average Peak Plantar Pressure (Kpa)

	Right Barefoot	Left Barefoot	Right In-shoe	Left In-shoe
Female	640.26	671.82	98.22	104.4
Male	621.56	555.47	139.52	130.38

Table 2: Percentage Reduction in Peak Plantar Pressure due to Custom Made Insoles

	Right Foot	Left Foot
Female	84.7%	84.5%
Male	77.6%	76.5%



Figure 1: E-Med Platform system



Figure 2: Pedar Inshoe System

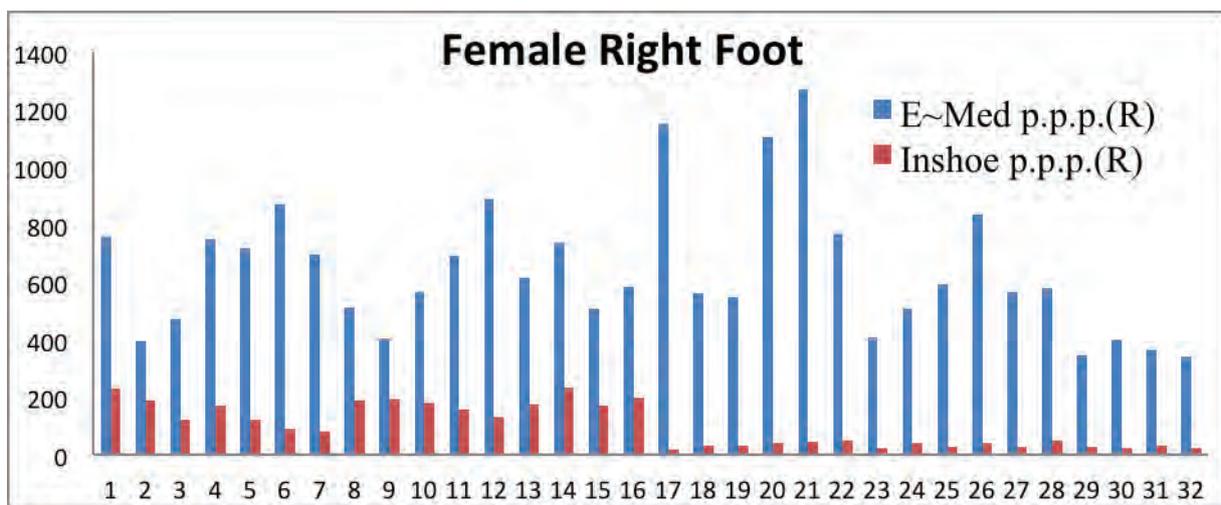


Figure 3: Comparison of barefoot (e-med) and in-shoe peak plantar pressure for the female right foot

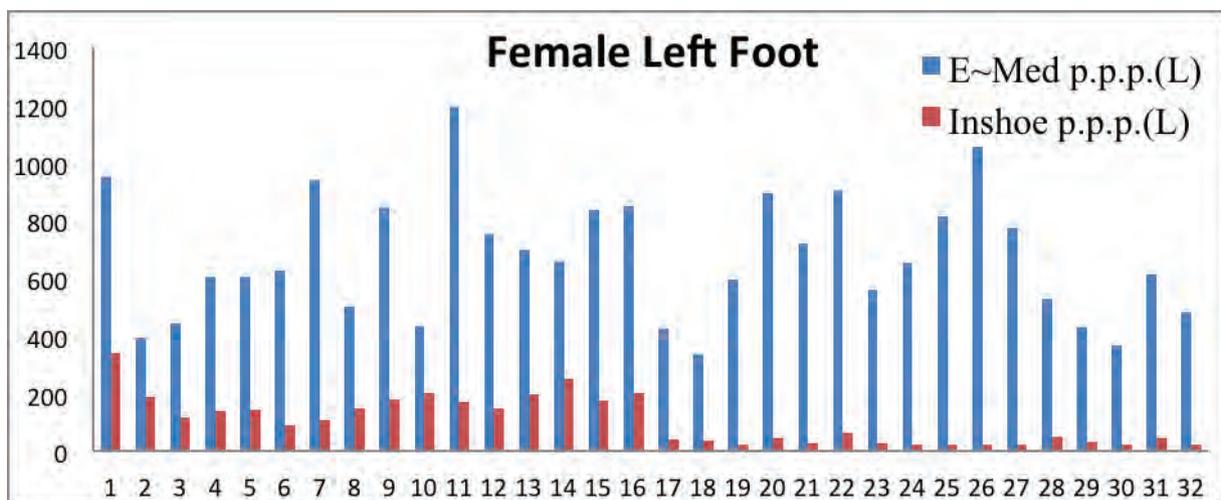


Figure 4: Comparison of barefoot (e-med) and in-shoe peak plantar pressure for the female left foot

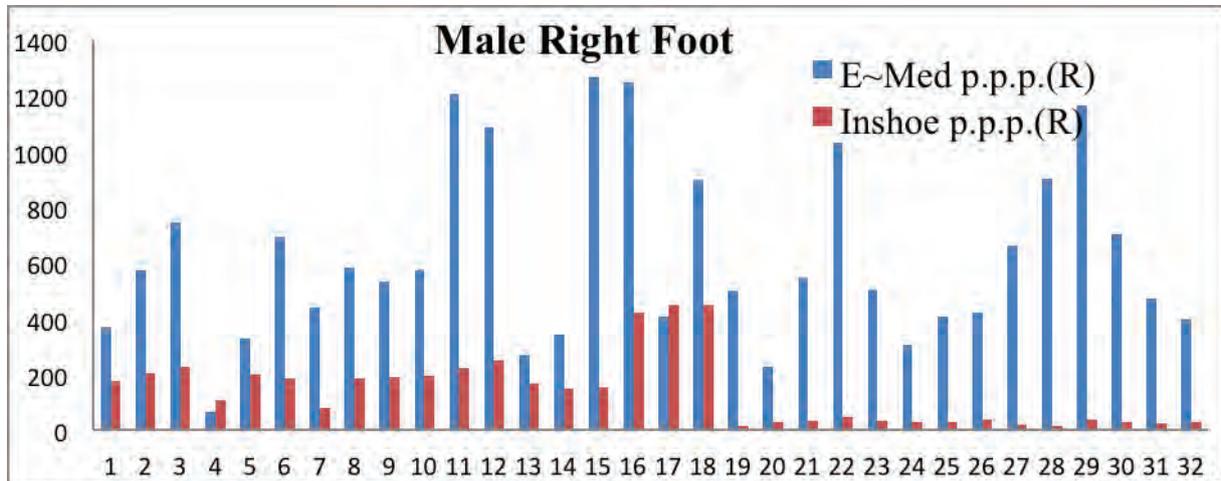


Figure 5: Comparison of barefoot (e-med) and in-shoe peak plantar pressure for the male right foot

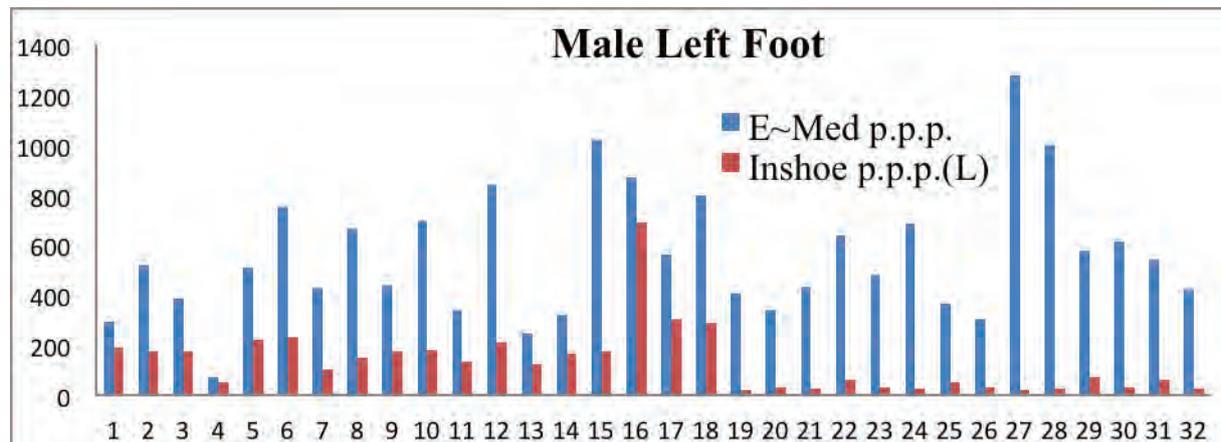


Figure 6: Comparison of barefoot (e-med) and in-shoe peak plantar pressure for the male left foot

reduce the average peak plantar pressure and therefore, reduce the risk of diabetic foot ulceration related to elevated plantar pressure in diabetic patients in general and those with neuropathy in particular. The custom-made insoles can help to protect the foot from elevated plantar pressure and thus improve the quality of life of diabetic patients by helping them walk safely with reduced risk of foot ulceration.

Recommendations

Based on the findings of this study, it is highly recommended that diabetic patients be provided with custom-made insoles to protect their feet from ulceration and reduce the possible risk of amputation. This practice can provide them with better quality of life, and at the same time can reduce the burden on healthcare system by reducing hospitalization time and amputation rate.

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Study of Trace element levels in Sudanese Moringa Olivera Leaves Using XRF Technique

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Abstract:

Moringa Olivera is one of the most important plants in earth in fields of nutrition and medicines, and has economic value. The main objectives of this study were to measure trace elements concentrations and calculate cofactor of some elements K, Ca, Fe, Cu and Zn. Five samples were taken from soil and leaves of Moringa Olivera from Alsamrab area, analyzed by X-ray fluorescence (XRF) to measure concentrations of trace elements, which are K, Ca, Mn, Fe, Cu, Zn, Pb, Br, Rb, Y, Zr and Nb which has concentrations of (6786 ± 1650) , 26920 ± 1209 , 1051.2 ± 902.57 , 41800 ± 3994.997 , 13.04 ± 1.890 , 65.68 ± 11.932 , 22.48 ± 5.266 , 6.2 ± 1.235 , 48.14 ± 7.87 , 18.66 ± 1.088 , 307.8 ± 55.91 and 19.54 ± 3.95 ppm, respectively. Comparison between Sudanese Moringa Olivera and African studies (Nigeria, Burkina Faso and Ghana) concentrate in Ca, K, Cu, Zn and Fe elements. Nigerian Moringa (303, 1.65, N.F., 3.33 and 13.85 ppm), respectively. Burkina Faso Moringa (2098, 1922, N.F., 5.4 and 28.3 ppm), respectively. Ghanaian Moringa (26.4, 21.7, 7.1, 13.7 and 175 ppm). The results showed significantly cofactor of K and Ca (5.6% and 2.9%). Moringa has a competitive characteristic with other Sudanese food (Mango, Baobab and Pumpkin).

Keyword: Moringa, trace element, XRF

الملخص: تعتبر المورينغا أوليفيرا هي واحدة من أهم النباتات في الأرض في مجالات التغذية والأدوية وذات قيمة اقتصادية. تمثلت الأهداف الرئيسية لهذه الدراسة في قياس تركيزات بعض العناصر الكيميائية وحساب المشترك عامل من بعض العناصر مثل البوتاسيوم، الكالسيوم، الحديد، النحاس والزنك. أخذت خمس عينات من التربة وأوراق المورينغا أوليفيرا من منطقة السامرأب وتم تحليلها بواسطة مطياف مؤشر تحليل المعادن لقياس تركيزات العناصر الكيميائية، والتي هي البوتاسيوم، الكالسيوم، المنغنيز، الحديد، النحاس، الزنك، الرصاص، برازيلي، الروبيديوم، Y، عنصر الزركون وملحوظة التي لديها تركيزات (6786 ± 1650) ، 26920 ± 1209 ، 1051.2 ± 902.57 ، 41800 ± 3994.997 ، 13.04 ± 1.890 ، 65.68 ± 11.932 ، 22.48 ± 5.266 ، 6.2 ± 1.235 ، 48.14 ± 7.87 ، 18.66 ± 1.088 ، 307.8 ± 55.91 و 19.54 ± 3.95 جزء في المليون، على التوالي. مقارنة بين المورينغا أوليفيرا السودانية والدراسات الأفريقية (نيجيريا وبوركينا فاسو وغانا) نجد ان تركيز عناصر الكالسيوم والبوتاسيوم والنحاس والزنك والحديد في المورينغا أوليفيرا النيجيرية (303، 1.65، N.F.، 3.33 و 13.85 جزء في المليون)، على التوالي. يوجد، 3، 33 و 13، 85 جزء من المليون، على التوالي. المورينغا أوليفيرا بوركينا فاسو (2098، 1922، N.F.، 5.4 و 28.3 جزء في المليون)، على التوالي. المورينغا أوليفيرا الغانية (26.4، 21.7، 7.1، 13.7 و 175 جزء في المليون). أظهرت النتائج العامل المساعد بكثير من البوتاسيوم والكالسيوم (5.6% و 2.9%). المورينغا كانت فيه خصلة تنافسية مع الطعام السوداني (مانجو، باوباب والقرع).

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Introduction:

A trace element is an element whose concentration is less than 1000 ppm (0.1%) in a sample of rock, soil, or any natural product. Trace elements include trace metals, heavy metals, micronutrients¹. The main sources of trace elements are soil parent materials (rocks), fertilizers, biosolids, irrigation water, coal combustion residues, auto emissions and metal smelting industries². Even though some trace elements originate from rocks and some are essential for plant growth and development, when present in soils at elevated levels those same elements become toxic. Trace elements that have been taken up by plants, especially those grown on contaminated soil could move up the food chain, some accumulating in the fatty tissue of animals and/or humans. Some trace elements of potential concern as soil contaminants are Arsenic (As), Boron (B), Cadmium (Cd), Chromium (Cr), Copper (Cu), Fluorine (F), Lead (Pb), Manganese (Mn), Mercury (Hg), Molybdenum (Mo), Nickel (Ni), Selenium (Se) and zinc (Zn)³. Trace elements could be (Essential, Probably essential and non-essential elements). Essential trace elements include iron, zinc, copper, cobalt, chromium, fluorine, iodine, manganese, molybdenum and selenium. Probably essential such that nickel, tin, vanadium, silicon, boron. Non-essential trace elements, which include aluminum, arsenic, barium, bismuth, bromine, cadmium, gold, lead, lithium, mercury, rubidium, silver, strontium, titanium and zirconium is all found in plants⁴. A valid concept of the nature

of soil must avoid the common error that soil is simply a mixture of unconsolidated material, resulting from the weathering processes of underlying rocks. Soil is a natural body, having both mineral and organic components in addition to physical, chemical and biological properties⁵. Soil properties, therefore, cannot be a simple reflection of the combined properties of all soil components. Knowledge of the association of trace elements with particular soil phases and their affinity to each soil constituent is the key to a better understanding of the principles governing their behavior in soils. The "normal concentrations" of trace elements in soils are of great interest as background values needed for any assessment of the degree of soil contamination⁶. According to the Soil Science Society of America (SSSA), soil is a living system that represents a finite resource vital to life on earth. It forms the thin skin of unconsolidated mineral and organic matter on the earth's surface⁷. It develops slowly from various parent materials and is modified by time, climate, macro- and microorganisms, vegetation and topography. Soils are complex mixtures of minerals, organic compounds and living organisms that interact continuously in response to natural and imposed biological, chemical and physical forces^{8,9}. Soil is the main source of trace elements for plants both as micronutrients and as pollutants. It is also a direct source of these elements to humans due to soil ingestion affected by dust inhalation and absorption through skin¹⁰.

The soil-plant transfer of trace elements is a

part of chemical element cycling in nature. It is a very complex process governed by several factors, both natural and affected by humans^{11,12}. Thus, the prediction of trace element uptake by plants from a given growth medium should be based on several biotic and abiotic parameters that control their behavior in soil^{13,14}. Trace element concentrations in plants reflect, in most cases, their abundance in growth media (soil, nutrient solution, water) and in ambient air. Plants exhibit a variable, and sometimes specific, ability to absorb trace elements from soil. Plants absorb trace elements by roots from soil (or other growth media) and by above ground parts from aerial deposition^{15,16}.

Materials and Methods:

A farm of Moringa Olivera in AL-Samrab area was chosen to take samples of soil and leaves. Five samples taken from each hectare on May 2014 at morning. For Leaves, it was collected from each hectare. The soil samples were first ground to powder from by using mechanical grinder. Then they were pressed into a pellet form using a pressing machine. The latter consists of die system, comprising base cylinder, and plunger, two pellets of steel and extraction ring. The base was placed on the bench top, the cylinder is assembled onto the base and one of steel pellets was placed into the bore of the cylinder with polished face up. The sample is poured into the bore of the cylinder and side of cylinder is tapped, so that the powder is homogeneously distributed

across the face of the polished steel pellet, the second steel pellet is then inserted with polished face down. A pressure of about 15 tons is usually applied to make a good pellet. EDXRF spectrometer was used to quantify the elemental compositions in samples. Each spectrum was collected for a lifetime of 500s, EDXRF spectrometer with Cd109 radioactive source as a source of excitation. The characteristic X-ray emitted from the sample were detected using Si (Li) detector with Full Width at Half Maximum intensity (FWHM) equal 170 eV at 5.96 KeV. The software AXIL was designed for full treatment dealing with spectra were recorded (Fig.1)



Figure 1. EDXRF spectrometer with Cd109 radioactive source as a source of excitation

The results:

In order to evaluate the quality of the analytical result obtained the IAEA standard reference material (IAEA-SOIL-7) was analyzed. The results of quantitative and qualitative analysis of the sample were shown in Figure 2, Fig.3 and Fig. 4. the relative error as a measure for accuracy are given in table 2.1.

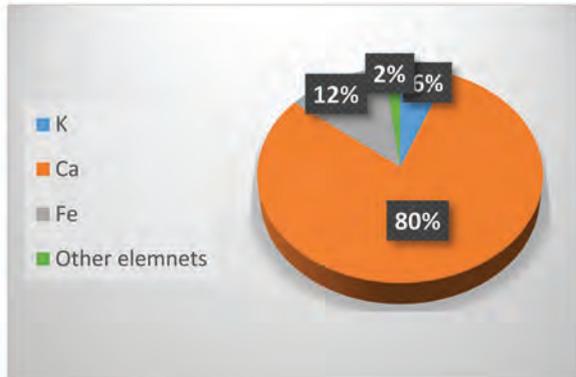


Figure 2. Most common elements in Sudanese Moringa Olivera

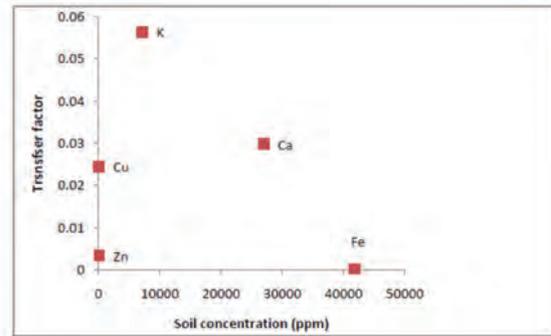


Figure 4. The Transfer Cofactor of Sudanese Moringa Olivera

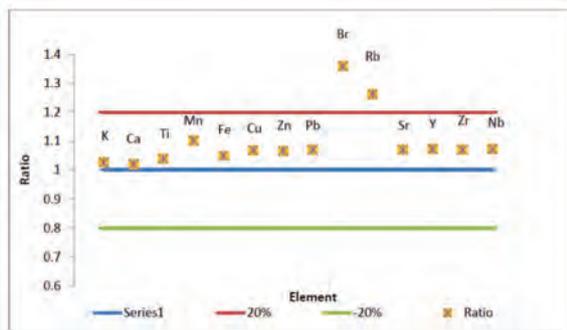


Figure 3. The concertation of different elements measured in Sudanese Moringa Olivera

Table 2. Showed results of trace elements concentration (ppm) in Moringa leaves and the cofactor:

Element	Leave	Soil Concentration (ppm)	Transfer Cofactor
K	400	7097.5 ± 1727.2	0.056358
Ca	801	26920 ± 1209.1	0.029755
Fe	10.7	41800 ± 3994.9	0.000256
Cu	0.318	13,04 ± 1.9	0.024387
Zn	0.223	65.68 ± 11.9	0.003395

Table 1. The results of Moringa concentration in Soil (ppm) (IAEA-SOIL-7):

No.	Element	Concentration (ppm) (Mean ± Standard Deviation)
1	K	7097.5 ± 1727.2
2	Ca	26920 ± 1209.1
5	Fe	41800 ± 3994.9
6	Cu	13.04 ± 1.9
7	Zn	65.68 ± 11.9

Table 3. The results the concentration in ppm of Ca, K, Cu, Zn and Fe Sudanese Moringa with another study from Nigeria, Burkina Faso and India:

Element	Sudanese Moringa	Nigeria Moringa	Burkina Faso Moringa	Indian Moringa
K	801	303.00 ± 16.00	2098	26.4
Ca	686	1.65 ± 0.49	1922	21.7
Fe	0.318	N.F.	N.F.	7.1
Cu	0.223	3.33	5.4	13.7
Zn	10.7	13.85 ± 12.41	28.3	175

Table 4. The results trace elements concentrations of Moringa and Sudanese food:

Element	Sudanese Moringa	Mango	Baobab	Pumpkin
K	801	0.3	250	14.25
Ca	686	207	2500	315
Fe	0.318	N.F.	N.F.	N.F.
Cu	0.223	0.07	1.37	3.9
Zn	10.7	0.55	1.5	3.2

Table 5. The daily need of the human body from the trace elements in ppm (Ca, K, Cu, Zn and Fe)

Element	Sudanese Moringa	Daily Intake	Morigna Leaves
K	801	1000	801
Ca	686	3500	686
Fe	0.318	2	0.318
Cu	0.223	15	0.223
Zn	10.7	15	10.7

Discussion:

In this study, high concentrations of K, Ca, Fe, Ti, Cu, Zn, Pb, Br, Rb, Y, Nb, Mn, Zr and Sr were found. In leaves, samples observed (Zn, Fe, Ca, K and Cu) elements which transferred from soil. After calculate the cofactor of each element observed that the highest one is K (9%) then for Ca, Fe, Cu and Zn are (2%), (0.02%), (2%) and (0.3%) respectively. In 2013, Enugu State University of Science and Technology, Enugu State, Nigeria has made study on Moringa and *Ficus capensis* to determine vitamins and minerals including trace elements, which detected in this thesis. They found that Moringa leaves has Ca, Zn, Fe and K of (303.00±16.00,

3.33, 13.85±12.41 and 1.65±0.49 ppm) respectively. In *Ficus capensis* also for same elements are Ca, Zn, Fe and K are (383.16±1.50, 53.33±43.33, 26.14±2.05 and 2.39±0.06 ppm) respectively(13). Sudanese Moringa leaves has higher concentrations of Ca (801 ppm) and K (400 ppm), while in Nigerian Moringa higher in Zn (3.33 ppm) and Fe (13.85±12.41 ppm). In *Ficus capensis* noticed that higher in Zn (53.33±43.33 ppm) and Fe (26.14±2.05 ppm). In 2011, at Burkina Faso a study was carried on Moringa leaves to determine trace elements(14). Study showed that concentrations of Ca, K, Fe, Zn are (2098, 1922, 28.3 and 5.4 ppm) respectively. According to Sudanese Moringa leaves Ca (801 ppm), K (400 ppm), Fe(10.7 ppm) and Zn(0.223 ppm) are less than Burkina Faso Moringa which has higher concentrations of Ca(2098 ppm), K(1922 ppm), Fe(28.3 ppm) and Zn(5.4 ppm). Department of Nutrition and Food Sciences, University of Ghana has been studied on Indian samples of Moringa leaves to detect trace elements, study observed that Ca, K, Cu, Zn, Fe has concentrations of (26.4, 21.7, 7.1, 13.7 and 175 ppm) respectively(15). In this thesis Ca and K is higher than Indian. Indian Moringa has higher concentration of Cu, Fe and Zn than Sudanese type. On other hand, Moringa could compete other types of food; particularly Sudanese food. Along with Sudanese study on common Sudanese food (Mango, Baobab and Pumpkin) which carried on 2011 at Food research Centre in Shabbat, observed that very high concentrations of Ca and Fe with food detected, also for K

but Baobab has higher amounts of it. For Zn Pumpkin is the highest and Mango is least. Moringa has higher amounts of Ca and K beside other (Ti, Mn, Fe, Cu, Zn, Pb, Br, Rb, Sr, Y, Zr and Nb) which indicate that our soil is very rich with trace elements when compare these results with Nigerian study. Transfer cofactor show excellent results in K, Ca, Zn and Cu, so Moringa leaves is very rich in these elements, which can be major source for nutritional value.

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Clinical characteristics of Herpes Zoster – A retrospective clinical study –

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Abstract

Background

Herpes zoster also known as shingles or Zona and is caused by a neurotrophic DNA virus called Varicella Zoster, a member of the herpes viridae [1]. The incidence of herpes zoster ranges from 1.2 to 3.4 cases, reaching up to 3.9 –11.8 per 1,000 individuals among those older than 65 years [2].

Material & methods

Medical records from a period of 2013 – 2015 march were analyzed for the details regarding number and clinical presentation of patients diagnosed as herpes zoster. Twelve cases with complete clinical details were selected and analyzed.

Results

Twelve of the affected patients were aged between 21 to 62 years and eight of them were male. Maxillary nerve and left side was affected more. All the patients complained severe pain with severity of 10 in visual analog scale (VAS). Clusters of vesicles, ulcers, post infection hypo / hyper pigmentation and post herpetic neuralgia were reported. Two of the patients are serologically confirmed cases of HIV+ive.

Conclusion

1. Herpes zoster affecting maxillary nerve is more often seen in dental institution.
2. Left side nerve is more affected and oral lesions are seen only in cases of maxillary and mandibular nerve.
3. Post herpetic neuralgia is more seen in older patients above 50 years.
4. Post infection pigmentation could be attributed to poor hygiene and secondary bacterial infection.

Key words;- Herpes zoster, Varicella Zoster virus, pigmentation, Prodromal pain and Post Herpetic Neuralgia.

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الملخص : يعتبر فيروس الحماق النطاقي هو المسبب لمرض الهربس النطاقي، وتتراوح نسبة حدوث مرض الهربس النطاقي بين ١, ٢ - ٣, ٤ حالة، وقد تصل الى ٩, ٣ - ٨, ١١ حاله من بين كل ألف شخص يزيد عمرة عن ٦٥ عاما.

وبمراجعة الملفات الطبية للمراجعين خلال الفترة من ٢٠١٣ - ٢٠١٥ تم رصد ١٢ حالة هربس نطاقي بأعراض سريرية متكاملة، وتراوحت أعمارهم بين ٢١-٦٢ عاما وكان منهم ٨ ذكور، وقد غلب وجود الأعراض المرضية في العصب الفكي العلوي والجانب الأيسر للوجه. وقد عانى كافة المرضى من ألم شديد مقداره ١٠ درجات وفقا لمقياس النظير البصري، وقد لوحظ وجود حوصلات وقرح كذلك فرط ونقص التصبغ التالي للعدوى البكتيرية الثانوية والألم العصبي التالي للإصابة الهربسية.

وقد خلصت الدراسة الى الآتي:

- * زيادة حدوث مرض الهربس النطاقي في العصب الفكي العلوي لدى مرضى كليات طب الأسنان.
- * زيادة حدوث مرض الهربس النطاقي في الجانب الأيسر للوجه، مع ملاحظة وجود التقرحات الفموية حال إصابة العصبين الفكي العلوي والفكي السفلي.
- * زيادة حدوث الألم العصبي التالي للإصابة الهربسية في المرضى الذين تزيد أعمارهم عن ٥٠ عاما.
- * التصبغ التالي للعدوى البكتيرية قد يكون سببه عدم العناية و الاهتمام بالصحة العامة للجسم، أو وجود عدوى بكتيرية ثانوية.

Introduction

Herpes zoster (HZ) is a condition characterized by localized eruption of vesicular lesions along the trajectory of a sensory nerve as well as pain and inflammation of the affected nerve root [3]. The word Herpes Zoster is derived from the Greek word Herpein meaning "creep" referring to the latent and recurring infections and Zoster meaning "belt" or "girdle" named after the characteristic belt-like dermatomal rash [4]. Zoster sine herpete is a condition where a patient has all symptoms of herpes zoster except the characteristic rash.

Herpes zoster may have additional symptoms depending on the dermatome involved. Herpes zoster ophthalmicus involves the eye and occurs in approximately 10–25% of cases. It is caused by the reactivation of virus in

the ophthalmic division of the trigeminal nerve causing symptoms that may include conjunctivitis, keratitis, uveitis, retinal damage, chronic ocular inflammation, loss of vision, and debilitating pain. Herpes zoster ophthalmicus, also known as Ramsay Hunt syndrome involves the ear and is thought to result from the virus spreading from the facial nerve to the vestibulocochlear nerve. Symptoms include hearing loss and vertigo (rotational dizziness) [5]. Only in the beginning of the 20th century the first indications, that chickenpox and herpes zoster were caused by the same virus was noticed. This was eventually proved by the first isolation of the virus in cell cultures by the Nobel laureate Thomas Huckle Weller in 1953[6].

Pathophysiology

Herpes zoster results from the reactivation of varicella-zoster virus that

has been dormant in dorsal root ganglion or Gasserian ganglion in the base of the skull following primary infection known as “varicella” or chickenpox which generally occurs in children and young adults[7]. Years or decades after a primary infection, the reactivated VZV are liberated from the trigeminal ganglion and travels downwards along the axons of the affected nerve root to reach the nerve endings to cause characteristic cutaneous rash and vesicular eruptions[8]. Typically the viral particles take 3-4 days to reach the nerve endings, as the virus travel down the axons, it provokes perineural and intraneural inflammation experienced as prodromal symptoms that are often described as stinging, tingling, itching, aching, hyperesthesia, paresthesia, throbbing and even agonizing pain sometimes[9]. The prodromal pain may range from mild to severe. The vesicles eventually crusts, falls and heals within seven to ten days. Reactivation of the virus can be triggered by trivial trauma, physical and mental stress, radiotherapy, surgery etc. The most common sensory nerve affected are C₂, C₃, T₅, L₁, L₂ and ophthalmic branch of trigeminal nerve [10] and the distribution of the vesicular lesions follows the distribution of the involved nerve root.

The most frequent, debilitating complication of HZ and which is often difficult to manage is post herpetic neuralgia (PHN) a form of neuropathic pain in the dermatomes affected by the VZV infection. PHN may develop in one out of five patients

and the incidence increases significantly with age[11]. The pain associated with PHN is intense and disabling affecting the patient's quality of life [12]. Early diagnosis and prompt institution of antiviral medication in the prodromal stage itself can considerably reduce the morbidity of the disease.

Material & methods

Medical records from a period of 2013 – 2015 march were analyzed for the details regarding number and clinical presentation of patients diagnosed as herpes zoster. Twelve cases with complete clinical details were selected. The details like age, sex, affected nerve and side are tabulated in Table 1 and post infection complications like postherpetic neuralgia, hypo / hyperpigmentation and scar are tabulated in (Table-2).

Results:

The tabulated data was analyzed and out of twelve patients with herpes zoster, five (42%) were in the group-I and two (17%) were in group II and 4 (33%) of them in group IV and 1 (8%) in group V, no patient were in the group III (Table1). Eight (67%) of the documented cases were males and four (33%) were females. Eight (67%) patients had lesion on the left side of body. Regarding the nerve affected, two cases (17%) were in ophthalmic nerve, five (42%) cases were in maxillary nerve, two (17%) in mandibular nerve and three (25%) in spinal nerves (Table 1). Regarding the post infection pigmentation, four (33%) cases showed hypo pigmented scars and four (33%) case showed

Table 1.

No	Age	Sex	Nerve Affected	Prodromal Pain	R Or L Side	Stage Of Lesion	Post herpetic Neuralgia	Any Other
1	53	M	Ophthalmic Branch Of V -CN	Yes	L	Hypo And Hyper Pigmented Scars	Yes	Conjunctivitis And Difficulty To Open Eye
2	36	F	Ophthalmic Branch Of V -CN	Yes	L	Hyper Pigmented Pitting Scars	Yes	Residual Conjunctivitis
3	23	F	Maxillary Branch Of V -CN	Yes	L	Hyper Pigmented Pitting Scars	No	5 (21-25) Teeth Were Extracted And Missing.
4	21	M	Maxillary Branch Of V-CN	Yes	L	Hyper Pigmented Pitting Scars In Infra Orbital,Nose And Zygomatico Temporal Region	No	Nil
5	55	M	Maxillary Branch Of V-CN	Yes	R	Erythematous Area With Vesicles, Black Crustations In Infra Orbital,Nose And Zygomatico Temporal Region	No	Unilateral palatal Ulcers In R Side
6	58	M	Maxillary Branch Of V-CN	Yes	L	Vesicles, Black Crustations And Hypopigmented Healed Areas In Infra Orbital,Nose And Zygomatico Temporal Region	No	Unilateral palatal Ulcers In L Side
7	62	F	Maxillary Branch Of V-CN	Yes	R	Vesicles With Golden Yellow Color In Infra Orbital Region	Yes	Unilateral palatal Ulcers In R Side
8	33	M	Mandibular Branch Of V -CN	Yes	L	Clusters Of Vesicles In Face And Ipsilateral Oral Mucosa	No	Unilateral Ulcers In L Side Buccal Mucosa, Lingual Mucosa And Labial Mucosa
9	51	F	Mandibular & Maxillary Branch Of V -CN	Yes	L	Ulcers In Angle Of Mouth,Half Of Tongue,Palate	Yes	Upper Labial Mucosal Ulcers
10	23	M	Cutaneous Branches Of Cervical Plexes	Yes	R	Hypopigmented Scars In Supraclavicular, Greater Auricular And Transverse Cervical	No	Hiv +Ive
11	21	M	T6 Spinal Nerve	Yes	R	Hypopigmented Scars In Skin Below The Nipple	No	Hiv +Ive
12	25	M	T10 Spinal Nerve	Yes	L	Erythematous Area Above Umbilicus With Clusters Of Intact Vesicles	No	Nil

hyper pigmented scars and in five (41%) cases had no pigmented scar. The pain that persists even after the resolution of acute infection is known as post herpetic neuralgia. In our study group four (33%) patients had post herpetic neuralgia, three out of this four cases occurred in patients above fifty years of age in the group IV and V (Table 2).

Discussion

Herpes zoster is a sporadic disease with an estimated life time incidence of 10-20% [13]. The incidence of HZ increases dramatically with age peaking in the seventh decade of life as the key risk factor for the development of HZ is waning of the cell-

mediated immune system associated with the normal aging [14]. Our patients were aged between 21 to 62 years. Eight patients are males and five of them are above 50 years.

A well documented risk factor for HZ is acquired inhibition of the cell-mediated immune response, such as treatment with immunosuppressive drugs or infection with human immunodeficiency virus (HIV) [15]. The relative risk of HZ is 15 times greater in HIV positive individuals and the recurrence rate of HZ in AIDS patients is as high as 25%, compared to less than 4% in immunocompetent individuals [16]. Ten of our cases are immunocompetent individuals and two were HIV 1+ive.

Although herpes zoster typically resolves within 2 weeks neuralgic pain may persist weeks or even years after the resolution of the rash. Postherpetic neuralgia is more common in patients older than 50 years [17]. All our patients complained severe pain with severity of 10 in visual analog scale. Four patients developed post herpetic neuralgia and three of them were above 50 years of age. According to the Literatures 50 % of patients with herpes zoster ophthalmicus exhibits complications [18]. Two of our cases involving ophthalmic nerve showed eye changes like conjunctivitis, swelling of eyelids and difficulty in opening of eyes and were immediately referred to Ophthalmologist for management [Fig-1]. Seven cases exhibited hyper/hypo pigmented scar. Six of our cases were in early stage and exhibited clusters of intact vesicles in skin [Fig-2,4]. Oral mucosal ulcers are seen in five cases involving maxillary and mandibular nerves [Fig-3, 5]. In one case five teeth of upper jaw from 21- 25 (central and lateral incisor, canine and first and second pre molar) were unnecessarily removed by a general dental practitioner for the relief of pain. The most common oral complications in imunocompromised individuals are Neuralgia induced cavitation necrosis (NICO) and exfoliation of tooth which is most common, however the cases we report here did not show any complications except hyper pigmented scars. Three of our cases involved spinal nerves like cervical plexus, T6 and T10 spinal nerves [Fig-6].



Figure 1 HZ of ophthalmic nerve showing healed lesion and hyperpigmented scars distributed over the left half of forehead, eyelids and nose.



Figure 2 HZ of maxillary nerve showing clusters of yellowish blisters on the right middle one third of the face.



Figure 3 Intra oral view showing multiple small ulcers present on the right half of hard and soft palate.



Figure 4 HZ of left mandibular nerve showing unilateral clusters of vesicles distributed along buccal, mental nerve branches.



Figure 5 Intra oral picture showing unilateral distribution of erythema and pin headed sized ulcers in left half of lower labial mucosa.



Figure 6 HZ of T6 spinal nerve showing healing ulcerative lesions with area of hyper and hypopigmentation and scarring.

Antiviral therapy is the main stay in the treatment of HZ, inhibiting VZV replication and shortening the duration of signs and symptoms of the disease. However the effectiveness and the potential capacity to reduce the occurrence of complications, specifically postherpetic neuralgia is still a controversy. Acyclovir has been the standard drug in treatment of HZ however new drugs like Valaciclovir (1000 mg three times a day for 7 days) and Famciclovir (500 mg three times a day for 7 days) demonstrate superior efficacy, good safety and tolerability and a better patient compliance in terms of dosing regimen of 3 times a day compared with acyclovir's 800 mg 5 times a day dosing [19]. It is been reported that Acyclovir appears to benefit patients the most when therapy is initiated within 72 hours of onset of the skin lesions and higher rate of complications occurred among patients whose treatment was delayed [20]. The incidence of PHN in our cases could be due to the delay in reporting to hospital and delay in initiation of the treatment.

Treatment of PHN is complex and a multifaceted patient-specific approach is important. Clinical trials have shown that opioids, tricyclic antidepressants, and anticonvulsants and topical application of lidocaine patches or capsaicin may reduce the severity or duration of postherpetic neuralgia, either as single agents or in combination.

Pavan-Langston has outlined the following protocol for treatment of postherpetic neuralgia [21].

Anticonvulsants

Carbamazepine 100 mg orally at bedtime; increase dosage by 100 mg every 3 days until dosage is 200 mg three times daily, response is adequate or blood drug level is 6 to 12 µg per mL (25.4 to 50.8 µmol per L).

Gabapentin 100 to 300 mg orally at bedtime; increase dosage by 100 to 300 mg every 3 days until dosage is 300 to 900 mg three times daily or response is adequate

Tricyclic Antidepressants

Nortriptyline, Amitriptyline, or Desipramine 25 mg up to 75 mg at bedtime

Topical application of capsaicin ointment daily 4 times/day or lidocaine patches

Transcutaneous electric nerve stimulation

and, if necessary, neurosurgery (eg, Thermocoagulation of substantia gelatinosa Rolandi) have been found to be helpful in exceptional cases [21]. More serious complications, such as retinal involvement, may require days of intravenous therapy and months of oral antiviral therapy.

Conclusion

1. Cases of herpes zoster affecting maxillary nerve are more often seen in dental institution.
2. Left side nerve is more affected than right in this study
3. Oral lesions are seen in herpes zoster infection affecting maxillary and mandibular nerve.
4. The complication of postherpetic neuralgia is more often seen in older patients above 50 years.

5. Unnecessary dental treatment should be avoided during Prodromal pain and in post herpetic neuralgia.
6. The pain associated with herpes zoster is excruciating and all the patients grade it as 10 in the visual analog scale(VAS)
7. Post infection inflammatory hyper and hypo pigmentation is common and can be attributed to the poor hygiene and secondary bacterial infection.

Whilst HZ is rarely life-threatening, the incidence of long term morbidity such as visual disturbances and post herpetic neuralgia associated with the disease can be devastating [22]. The morbidity can be reduced by prompt institution of antiviral therapy as early as possible in the course of the illness. Hence an early diagnosis is mandatory for assuring greater quality of life for these patients.

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Biomechanical Assessments of the Snatch Lift: A Case Study

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Abstract

The main aim of this study was to assess the Snatch lift technique - performed by elite weight lifter - by (a) comparing the angular kinematics of upper and lower body joints in both side, and (b) determining the mechanical work, the power output, and the linear kinematics of the barbell during the first and second pulls in the snatch lift. For performing data collection and evaluation, the following software have been utilized: Vicon motion-capture system (Nexus 1.8.4) synchronized with two force plates – in addition to using Polygon 3.5.2 and Siliconcoach software. The result of this study shows that the maximum barbell height is about (1.44 m; that is, 93% of his height 1.55 m) and drop displacement is about (29.7 cm; which is, 20% of his maximum barbell height 1.44m). While during the first pull, the lifter has shown 34 degree of knees flexion; in the second pull, athlete planter flexed his ankle for about 17 degree, which is considered an important part to be included in the explosive phase as it contributes to 10% of the total power produced for the pull. During the second pull phase, the relative power outcome has increased by 100 % in comparison of first phase. The velocity in the second pull was significant (2.5 m.s^{-1}), which might be secondary to the relatively lightweight that was lifted (40 Kg). Thus, it will be interesting to see the impact of increasing the weight lifted on the performance of the athlete as well as its influence on the biomechanical variables measured when evaluating the Snatch lift.

الخلاصة : الهدف الرئيسي من هذه الدراسة هو تقييم تقنية رفع الخطف أو التي يؤديها رافع نخبة الوزن - عن طريق (أ) مقارنة حركات الزوي من مفاصل الجسم العلوية والسفلية في كل جانب، و (ب) تحديد آلية عملها، وإنتاج الطاقة وعلم حركة الحديد الخطية خلال السحب الأولى والثانوي في رفع الخطف.

تم استخدام برنامج (VICON) -نظام حركة الالتقاط (نيكس ١,٨,٤) متزامن مع اثنين من لوحات القوة -بالإضافة إلى استخدام مزلع البرمجيات ٣,٥,٢ و Silicon coach. كأداء لجمع وتقييم البيانات

ونتيجة لهذه الدراسة ظهر أن الحد الأقصى لارتفاع الحديد (١,٤٤ م، وهذا هو، ٩٣٪ من طول قامته ١,٥٥ م) وقطر التشريد حوالي (٢٩,٧ سم؛ وهو، ٢٠٪ من الحد الأقصى لارتفاع الحديد ١,٤٤ م). بينما خلال السحب الأول قد أظهر رفع ٣٤ درجة انثناء في الركبتين.

في السحب الثاني، استعرضوا الكاحل الرياضي الزارع لنحو ١٧ درجة، والتي تعتبر جزءاً مهماً ليطم تضمينها في المرحلة المتفجرة كما أنها تساهم في ١٠٪ من إجمالي الطاقة المنتجة للسحب خلال مرحلة الانسحاب الثانية، ازدادت نتيجة القوة النسبية بنسبة ١٠٠٪ بالمقارنة مع المرحلة الأولى.

كانت السرعة في سحب الثاني كبيرة (٢,٥ م.س^{-١})، والتي قد تكون ثانوية بالنسبة للوزن الخفيف نسبياً (٤٠ كغم).

وبالتالي، سيكون من المثير للاهتمام أن نرى تأثير زيادة الوزن ترفع على الأداء الرياضي، وكذلك تأثيرها على متغيرات قياس النشاط الحيوي عند تقييم رفع الخطف.

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Introduction

The weight lifting technique of snatch is the most technical component; that is implemented for lifting a weight/bar from the initial phase to straight arm over head position in one attempt¹. The core evaluation of the skill mainly originated to describe the complexity of the weight lifting; since, the uniqueness of snatch is the combination of various motor physical components like strength, explosive strength, coordination, stability and mobility that are not seen in any other sports techniques².

The success of snatch depends on mastery of skill, techniques and punctilious of the training program as per the guidance of coaches or sports. In the snatch, as the case in other sports techniques, the sports scientist have a great interest of accruing accurate and complete information about the performance characteristics of the elite players/weight lifters. Following the initial/preparation position, is the phases of the Snatch lift, which is considered as the key factor of the snatch performance³ can be divided into five phases; that are, the 1st pull, transition, 2nd pull, turnover, and catch phase. The first-pull phase is when the weightlifter lifts the barbell - with external weight - from the floor to clear knee height. For better performance during the first phase, flexion of hip, knee, and ankles is essential, while outward pointing of toe. The main action the lifter should perform during the Transition phase, that is between first and second pull phase, is to adjust the body in relation to the

barbell. The second pull of the snatch starts from the bar when clears the knee height and ends when reaching full extension of lower limbs. During the second Pull, the weightlifter fully extends the knee and hips while the bar should be as close as possible to the body. When the bar reaches chest level, the aim is to drop beneath the bar and catch in a squat position. The lift of the bar is finishes with the bar at the static (hold) standing position. In other words, the main principle of snatch is to lift the barbell-weight, from the floor, to a stable standing position at overhead with the locked arm. While the mechanical inertia of an object is defined as its resistance to change, mechanical work during snatch is described as the total magnitude of the force that is applied in a specific distance. For a successful weight lifting in a snatch techniques, the bar height has to be high enough to allow the weightlifter to get into the catch placement under the bar, as well as to overcome the gravitational force that is working in the opposite direction of the pull. To overcome the gravitational force and to obtain positive benefit from inertia, for gaining maximal vertical displacement above the point at which force can significantly be applied, the player must produce momentum⁴.

During the phase of first pull, changes are noticed in the bar kinetic and potential energies; as the potential energy goes higher and the athlete had to maintain a significant amount of work for a long period to overcome the effect of inertia¹. In the second pull phase, the athlete had to work too quickly as compare to first pull

phase because of duration variance. Duration of first pull is greater as compared second pull. Therefore, and while the first pull is relatively slow, which can be considered strength oriented phase, the second pull, which should be quick, can be considered as power generation phase or power oriented⁵. Stone (1998) revealed that the phase of second pull has the most critical role in snatch lifts, during which the maximum power must be generated⁶. Additionally, Reiser et al. (1996)⁷ describe the bar kinematics as the indicative of errors in the technique of lifting. Successes snatch lift attempts have been described by Isaka et al. (2010)⁸ as those that maximized pull after second pull and minimized the loss in height of the bar during the squat. In the context of weightlifting, the majority of previous biomechanical studies addressing Snatch lift, have focused on the kinematics of the body segment and barbell during international events,^{9,10} with a common aim; that is, to find out the kinematical differences for measuring the technical factors of snatch. Overall, there are relatively limited studies available for the examination of kinematic and kinetics parameters while performing the Snatch lift. Therefore, the main aim of this study is to evaluate the Snatch lifting technique of an athlete, by assessing the biomechanical advantages, and evaluating some kinematic and kinetics variables that are taking place during the Snatch.

Methodology

Participants

One male elite weightlifter, who is a current member of Saudi National

Weightlifting team, has been selected as the participants of the study. Regarding the anthropometric data, the participant has an age of 34 years old, standing height 1.55 m, and body weight of 65 kg. The weightlifter had not any neurological or musculoskeletal disability that would strike snatching performance or any cognitive impairment that would inhibit motor learning. The weightlifter provided consent before data collection session.

Instrumentation

Data recording was conducted in the biomechanics laboratory, in the Department of Physical Therapy, at University of Dammam, KSA. Three-dimensional movements of the full-body segments were tracked by using 10 Bonita digital infrared cameras with 8.5 mm lenses, collecting at 100 Hz. Full calibration of all cameras were conducted - obtaining refinement 1000 frames samples at 100Hz while waving an active wand using frying pan technique. Our experimental sets up a standard meet, if not exceed, the standards used in the previous researches. Two AMTI force platform (Watertown, MA), with six-channel on each, was synchronized with the Vicon-motion capture system, to be used for collecting ground reaction force data at 2000 Hz. The two force platform was connected directly to the Vicon MX hardware, and data was processed using the Vicon Nexus (Centennial, CO) motion analysis software version# 1.8.4 and was smoothed using a Woltringquintic spline, low-pass filter with a cutoff frequency of 6 Hz. Data was analyzed

with Vicon Polygon (Centennial, CO) software version# 3.5.1 and was presented by using Microsoft Excel 2011 program.

Data Collection

A group of biomechanics conducted data collection at biomechanics laboratory, in the Department of Physical Therapy, at University of Dammam, KSA. The athlete was asked to wear the comfortable non-reflective weight-lifting outfit and their preferred weight lifting shoe during the data recording session. Before obtaining informed consent letter from the participant, the athlete filled out a brief history of injury to ensure he was healthy and fit for the snatch performance at the time of trials. Also, two markers that were affixed to both ends of the barbell, to quantify/visualize the trajectory of the bar while performing the Snatch, 39 reflective markers were attached on the participant, to form a full-body skeletal model that can be captured in 3-dimensions. Markers were affixed on the following body parts: Left/Right front head, Left/Right back head, Seventh cervical vertebrae, Tenth thoracic vertebrae, Clavicle, Sternum, Right back, Left/Right shoulder, Left/Right upper arm, Left/Right elbow, Left/Right Forearm, Left/Right wrist - thumb side, Left/Right wrist pinkie side, Left/Right second finger – dorsal side, Left/Right anterior superior iliac spine, Left/Right posterior superior iliac spine, Left/Right lateral thigh, Left/Right knee, Left/Right lateral shin, Left/Right ankle, Left/Right heel, Left/Right head of second toe.

To overcome the occlusion that might occur to the two anterior superior iliac crest, of the right and left side, two additional markers along the iliac crest, just superior enough to the corresponding right and left side, were included in the skeletal-template as two of the anterior markers that would be visible for constructing the pelvic segment during the deep squat (catch) phase of the Snatch.

Subject Preparation

After a good warm-up session of lifting the bar (free of weight), the subject was asked to stand on a static T-pose position on the two force plates for static calibration. After processing the static/calibration trial, and before capturing the dynamic (Snatch lifting) trials, the full-body anatomical coordinate system was constructed for each segment based on the static trial, through using of the Vicon Plug-In Gait standard full body marker set. During the dynamic trials, the subject was asked to perform his preferred Snatch technique with 40 kg of weight (barbell with external weight) in a specified area (over two force plates). Total of Ten successful snatch trials were recorded in the biomechanics lab. For the purpose of the study, six successful snatch trials were selected and processed, to be used for the analysis.

Data Reduction

After initial data processing by the Vicon Nexus 1.8.4, and through the utilization of two Bonita (720c) digital video cameras – capturing the trials from two views (anterior

and lateral view), six different phases of the snatch tails were identified as following: preparatory, first pull, transition, and second pull turnover and catch phase. Digital video clip taken from Two DV Bonita (720c) cameras were played in Silicon Coach, in the biomechanics lab, to identify and measure some variables (grip distance, the trajectory of the barbell) needed for qualitative analysis.

The average of joint angles in different phases, bar velocity, absolute work, relative work, absolute power and relative power were measured and analysis from normalized individual trial data. The work done for lifting the bar was measured, as suggested in Blazeovich's book "Sport Biomechanics The Basics: Optimizing Human Performance" (2010)¹¹, through multiplying the sum of ground reaction force (measured by the two force plate) by the distance the bar traveled during the lift (measured by tracking the trajectory of the bar). The relative power and work values were calculated by dividing the absolute work and power values by the lifter's body mass (65 Kg). The calculated power outputs only included the vertical work done by lifting the barbell, as suggested by Garhammer (1993)¹².

Data Analysis

To find out differences between the right and left side of the body, segments angle were examined using a *t*-test; additionally, R-L trend lines were created. As for the research design, Correlation and Regression analyzes were utilized to examine the relationship

between different parameter. All statistical analyzes were conducted using the (SPSS) v.18 statistical package for the social science. A significance level of $P < 0.05$ was used.

Results and discussion

Angle	Right	Left	<i>t</i> -value
	(M (SD	(M (SD	
Wrist	53.50 (2.88)	56.46 (1.72)	2.83
Elbow	162.42 (1.51)	161.19 (2.33)	1.08
Shoulder	48.21 (1.44)	50.30 (1.16)	2.75
Hip	48.90 (1.25)	50.25 (3.10)	0.98
Knee	80.66 (1.38)	94.35 (1.15)	*18.59
Ankle	76.90 (1.00)	94.35 (1.15)	2.82

Note: *M*=mean, *SD*=standard deviation. * Significance at 0.05 levels.

With regard to the analysis of data of joint angles during preparation phase of the snatch, and where a significance difference of the knee angle (KA) exists between the right and left side during the preparation phase (with *t*-value=18.59), insignificant differences were noticed in the rest of the angles measured - as obtained '*t*' ratio is less than the required *t*-value of 2.23.

Even though lifter's height might have an effect on the thigh and shin angle, the trunk angle should be constant, that is, around 30 degrees horizontally, during the preparation phase¹³. The findings of the study show that the athlete's trunk angle was approximately 42 degrees, which might influence his Snatch

technique. The higher trunk position might be due to the significant difference between right and left knee flexion, poor trunk stability, or lack in the hip and thoracic mobility, that would probably default to flexion at the lumbar spine. Additionally, there is a noticeable difference in terms of grip distance — measured from the inner border of the barbell to the outer border of each hand—, as the grip distance measured from the right side = 0.2 meter while (Left) side grip distance = 0.14 meter, with difference of about 6 centimeters that may affect the leverage of the bar. From the same context, and as recommended by Zachary (2004), the athlete can determine his optimal grip width by measuring the distance from the deltoid of one arm to the fist of the opposite arm - that is abducted to 90 degrees.

Table:2 Kinematics differences and the Relative angle between right and left side at first pull.

Angle	Right	Left	<i>t</i> -value
	(M (SD)	(M (SD)	
Wrist	(2.31) 51.70	(1.30) 60.95	*8.53
Elbow	160.47 (1.55)	162.77 (1.72)	*2.43
Shoulder	(1.91) 49.40	(1.60) 51.49	2.05
Hip	(1.97) 81.86	(1.97) 85.01	*2.76
Knee	139.11 (1.72)	139.30 (3.91)	0.10
Ankle	100.08 (1.54)	101.70 (3.05)	1.15

Note: *M*=mean, *SD*=standard deviation. * Significance at 0.05 levels.

The analysis of data represented in (Table 2) shows that there is an insignificant difference in kinematics between right and left side of bodily joints during first pull phase of the snatch; that is in, shoulder angle (SA), knee angle (KA) and ankle angle (AA), as obtained '*t*' ratio is less than the required '*t*' value of 2.30. Whereas significance differences of wrist angle (WA), elbow angle (EA) and hip angle (HA) exist between of right and left side in the first-pull phase (with *t*-value = 8.53, 2.43, and 2.76, respectively).

Since maintaining trunk angle is very important to conserving kinetic chain and transfer the force in next phase^{1,14}, which considered to be the key factor of the performance during the first phase^{15,16}, it is essential that the torso of the athlete to be constant in the same position relative to the floor during the first pull (about 30 degrees above horizontal). As stated by Hoffman et.al, (2004)¹⁶, the initial/first pull from the ground should be done by extending the knees, while maintaining torso angle above the horizontal line, and the higher than the hip. The finding of our study shows that the athlete arose his hips early. Consequently, the bar deviated slightly in front of the lifter's body due to the variation in grip distance and the significant differences in wrist, elbow and shoulder angle between right and left side.

Overall, the basic concept of snatch is that once the barbell lifted from the ground, the body of the athlete and the barbell should act as one unit, for better performance. The

functions of this unit work optimally when the barbell is moving close to the vertical line of gravity. In other words, if the barbell goes too far from lifter's body during any parts of the execution, more energy will be required to control the loaded barbell^{1,17}. Therefore, it is recommended for the athlete to get into the proper alignment and correct position of all bodily segments, starting from the initial position for the Snatch from the floor, all the way through the phases that follow.

Table 3: Kinematics differences and Relative Angle between right and left side at transition phase.

Angle	Right	Left	t-value
	(M (SD)	(M (SD)	
Wrist	51.13 (2.11)	53.38 (2.97)	1.51
Elbow	155.33 (3.79)	158.35 (5.75)	1.07
Shoulder	35.65 (1.61)	39.71 (2.58)	*3.26
Hip	116.50 (4.61)	120.23 (1.91)	1.82
Knee	144.05 (4.03)	143.50 (1.69)	1.01
Ankle	91.83 (2.48)	94.38 (1.69)	1.10

Note: *M*=mean, *SD*=standard deviation. * Significance at 0.05 levels.

With regard to the analysis of data of joint angles during transition phase of the snatch, and where a significance difference of the shoulder angle (SA) exists between the right and left side during the preparation phase (with *t*-value=3.26), insignificant

differences were noticed in the rest of the angles measured - as obtained '*t*' ratio is less than the required *t*-value of 2.3.

The main aim of Transition phase, that is between first and second pull phase, is to adjust the body in relation to the barbell. In this phase, the lifter has shown knee flexion of about 34 degree, which is more than what has been found by Bartonietz (1996)¹⁴; that is, about 20 degree of knee flexion during the transition phase. This flexion of the knee joint, during the transition phase, permits the athlete to use stretch reflexes of the knee extensors and provoke potential energy to generate the explosive muscular power needed for the second pull¹⁶. Furthermore, this also assists to adjust the center of gravity to utilize the power generated by hip in the second pull.

Table 4: Kinematics differences and Relative Angle between right and left side at second pull phase.

Angle	Right	Left	t-value
	(M (SD)	(M (SD)	
Wrist	44.23 (1.16)	45.58 (3.31)	0.94
Elbow	146.03 (2.49)	146.95 (3.49)	0.32
Shoulder	40.15 (2.03)	43.85 (1.09)	*3.90
Hip	141.55 (2.10)	147.03 (1.84)	*4.80
Knee	175.88 (2.89)	175.82 (2.04)	0.04
Ankle	114.13 (3.60)	121.55 (2.02)	*4.39

Note: *M*=mean, *SD*=standard deviation. * Significance at 0.05 levels.

The analysis of data in (Table 4) shows that there is an insignificant difference shown between right and left side of body kinematics during second pull phase of the snatch; that is in, wrist angle (RA), elbow angle (EA) and knee angle (KA) as obtain 't' ratio is less than the required 't' value of 2.30. Whereas significance differences of shoulder angle (SA), hip angle (HA) and ankle angle (AA) exist between of right and left side in the phase of the second pull.

The second pull, as the most explosive and powerful phase of the snatch, begins when the knees reach maximum flexion during the transition phase. During the phase of second-pull, the hips, knees and ankles are required to be violently extended; therefore, the final stage of second-pull phase is known as "triple extension" position as the athlete's ankles, knees and hips at their maximum extension range of motion ². During the second pull, the shoulders are rapidly flexed to position the body to support the barbell overhead; and with the violent raise of the shoulder -and pulling of arms- the resultant position support for continued elevation of the barbell while the athlete jumps under the barbell¹⁴. The findings of our study show that there is a significant difference with regard to hip, ankle and shoulder angles in both sides. These differences may be due to shifting the weight toward strong leg to generate maximum explosive strength (lauder and lake, 2008).

During the phase of the second pull, and as stated by Bartonietz (1996)¹⁴, the plantar flexion of the ankles joint results in

the heels rising off the ground, which add to the power needed for arising the bar. In this phase, athlete planter flexed of the ankle joint about 17 degree, which is considered an important part to be included in the explosive/ second-pull phase as it contributes to 10% of the total power produced for the pull, as stated in literature¹⁰.

Table 5: Kinematics differences and Relative Angle between right and left side at Turnover phase.

Angle	Right	Left	t-value
	(M (SD	(M (SD	
Wrist	(1.15) 67.01	(1.36) 70.20	*4.37
Elbow	138.05 (3.67)	143.88 (2.56)	*3.02
Shoulder	116.65 (3.24)	117.42 (1.69)	*3.85
Hip	(3.23) 91.55	(2.53) 96.05	*2.69
Knee	(1.95), 99.80	100.58 (3.19)	0.51
Ankle	(1.79) 74.66	(1.54) 76.21	1.60

Note: M=mean, SD=standard deviation. * Significance at 0.05 levels.

The analysis of data in (Table 5) shows that there is an insignificant differences show between right and left side body kinematics during turnover phase of the snatch; that is in, knee angle (KA) and ankle angle (AA) as obtain 't' ratio is less than the required 't' value of 2.30. Whereas significance differences of wrist angle (RA), elbow angle (EA), shoulder angle (SA) and hip angle (HA) exist between of right and left side in the turnover phase.

The turnover phase begins at max knee extension and ends when the barbell reaches

the max height, as the feet re-establish full contact with the ground before the start of the catch phase¹⁴. During the turnover phase, and while feet leave the ground and jump outward to a receiving or squatting stance, about shoulder width, the lifter begins moving the body downward to be positioned underneath the barbell.

There is asymmetry in term of maximum elbow flexion in the pull phase; as there is a noticeable variance between the right and left max elbow flexion that were measured in the turnover phase (42 degree and 37 degree, respectively). Furthermore, the asymmetry that was found in wrist, elbow, shoulder and hip angles might be related to the grip distance variance that was noticed earlier, starting from the preparation phase. Overall, it is recommended that both elbows should be flexed to approximately 80 degree (100 relative angle) as the weight is raised, and then they are straightened completely for the remainder of the lift².

The analysis of data (Table 6) shows that there is an insignificant differences in kinematics of between right and left side of body segments during Catch phase of the snatch; that is in, wrist angle (WA), shoulder angle (SA), hip angle (HA) and knee angle (KA) as obtain '*t*' ratio is less than the required '*t*' value of 2.30. Whereas significance differences of elbow angle (EA), and knee angle (KA) exist between of right and left side in the catch phase.

Table 6: Kinematics differences and Relative Angle between right and left side at Catch phase

Angle	Right	Left	<i>t</i> -value
	(M (SD	(M (SD	
Wrist	(1.79) 74.66	(1.54) 76.21	0.55
Elbow	158.58 (4.32)	166.65 (5.38)	*2.82
Shoulder	114.28 (5.66)	122.35 (6.80)	2.23
Hip	(4.05) 60.66	(4.49) 63.50	1.14
Knee	(5.38) 63.45	(5.20) 72.22	*2.87
Ankle	(7.78) 71.82	(4.82) 73.85	0.54

Note: *M*=mean, *SD*=standard deviation. * Significance at 0.05 levels.

The catch phase is executed by locking the arms and stabilizing the barbell overhead position, while the lifter in a downward movement. Following the catch position, the athlete goes up from the squat to stand position for finishing the lift. During the catch and rise position, the mobility of shoulders is evaluated as the shoulders (> 180 degrees) flexed², which is reported in our study.

The excessive flexion of the shoulders, in our findings, explains the increase in the horizontal displacement of the barbell - just after the beginning of descent from the maximum height; that is, HD3= 13.3 cm, with normal range of 3-9 cm as reported by Schilling et al. (2002)¹⁸. Lifter may need to monitor his excessive shoulders flexion, because the amount of energy exerted to control the loaded barbell increases as the

horizontal displacement of the bar increases during the lift¹⁷.

In previous studies, and from a mechanical perspective, an ideal barbell trajectory has been considered as an indicator of a correct technique and an effective pull^{8,19}. The horizontal displacement of the barbell during the snatch is one of the variables used to assess the technique of weightlifting¹⁷, as well as to test the efficacy of muscle power, especially during the pulling phase⁸.

As reported by Garhammer (1985)¹⁹, the horizontal displacement of the barbell by men athletes has been reported to be between (3 and 9 cm) in the first pull, between (3 and 18 cm) in the second pull, and between (3 and 9 cm) just after the beginning of descent from the maximum height. The lifter in our study has moved the bar forward then inward (HD1= 0.44 cm) during the first pull, then the bar crosses the vertical line forward (HD2= 8.4 cm) during the second pull, before it is received behind the vertical line (HD3= 13.3 cm). During the first pull and second pull phase, the barbell has significant positive vertical velocity (1.29 and 2.5 m.s⁻¹, respectively). In the end of the first pull, the barbell reached approx. 51% of relative vertical velocity. This value lesser than the previous researches shows that by the end of first pull barbell should reach 70 % of its vertical velocity²⁰. Overall, a continuous increase barbell velocity during the phases, with an absence of two peaks in the velocity curve⁴, is an indication that the technique is approximately effective. However, since the

trajectory of the bar travels forward at the start, this making the lifter lose leverage, which can be caused by the lifter swinging the bar, not having tight lats pulling the bar into the body, or the lifter starts with the bar too close to shins. Regardless of where the bar travels in relationship to this vertical line, it is imperative that the lifter keeps the barbell close to the body throughout the lift, to minimize the horizontal displacement of the bar and consequently diminishing the energy needed to control the bar trajectory¹⁷.

Despite the fact that the leverage has been lost, due to the forward movement of the trajectory during the first pull phase, which consequently affected the power output, barbell goes to maximum vertical velocity in the second pull phase was significant (2.5 m.s⁻¹), which might be secondary to the relatively lightweight that was lifted (40 Kg). Therefore, and as the load is considered to be an important factor that plays a significant role in the magnitudes of the horizontal and vertical kinematics as well as the velocity of the barbell, it will be interesting to see the impact of increasing the bar-weight on the performance of the lifter.

One of the feasible means to evaluate the technique of Snatch lift is to examine the maximum barbell height and the height of the bar during the catch phase. Lifting the barbell effectively requires minimizing (a) the peak height of the barbell at the end of the turnover and (b) the drop displacement while dropping under the barbell to the catch position. In other words, lower maximum bar-height and

Table 7: Linear kinematics of the barbell.

		Value
Vertical kinematics	First pull-Barbell height (cm)	48.6
	Second pull-Barbell height (cm)	98.2
	Maximum barbell height (m)	1.448
	Drop displacement (cm)	29.7
	Maximum vertical velocity of the barbell in the 1 st pull (m.s ⁻¹)	1.286 (%51.44)
	Maximum vertical velocity of the barbell in the 2 nd pull (m.s ⁻¹)	2.5
Horizontal kinematics		
	First pull-Horizontal displacement (cm); (HD1)	0.44
	Second pull-Horizontal displacement (cm); (HD2)	8.4
	Horizontal displacement toward weightlifter after beginning of descent from maximum height (cm); (HD3)	13.3

the drop displacement are among the most important indicators of an effective technique for a maximal snatch lift in weightlifters¹⁵. In international weightlifters, and during the highest barbell height during maximum attempts is 70% of the weight lifter height¹, the drops distance from the maximum height to the catch position has been cited to be just about 9 to 11 percent of the bars maximum height (Campos et al., 2006). The lifter in this assessment has a max barbell height of about (1.44 m; that is, 93% of his height that is 1.55

m) and drop displacement of about (29.7 cm; which is, 20% of his maximum barbell height 1.44m). Additionally, it was found in the study of Gourgoulis et al. (2004)⁵ that the barbell maximum vertical displacement of elite player was 1.25 m, although maximum vertical displacement value 1.15 m in other previous studies¹⁰. The major reason for inconsistency in the displacement might be due to anthropometrical differences.

Table 8: Mechanical work and power output in the first and second pulls

	First pull	Second pull
Absolute work ((J	195.7	224
Relative work ((J/kg	3.0	3.44
Absolute power ((W	3.26	(Increase 83%) 16
Relative power ((W/kg	0.05	(Increase 100%) 0.24

The relative power and work values were calculated by dividing the absolute work and power values by the lifter's body mass (65 Kg). The calculated power outputs only included the vertical work done by lifting the barbell

In weightlifting, total work done by the athlete has a significant influence on the levels of performance; since, it can be optimized by minimizing the amount of total work done by the athlete. Decreasing or increasing the total work, which is directly related to the ability and mastery of athlete, can be achieved by efficaciously utilizing the ability of power generation of muscles.

Consistent with Gourgoulis et al. (2002)¹⁰ findings, the mechanical work performed by the lifter of our study during the first pull (195 J) was less than that performed during the second pull (224 J). During the phase of first-pull, changes appear in the bar kinetic and potential energies. The potential energy goes higher and the athlete had to maintain a significant amount of work for a long period to overcome the effect of inertia¹. In the second pull phase, the athlete had to work too quickly as compare to first pull phase. Duration of first pull is greater as compared to second pull. While the first pull is comparatively slow and can be defined as strength oriented phase, the second pull is fast, and it can be considered as power generation phase⁵.

Concerning the power output, and compared to the first pull phase, there is a considerable increase in the absolute and the relative power of the second pull phase by (83% and 100%, respectively). The significant changes in power outcome between 1st and 2nd pull phase, in the current study, is in good agreement with the findings reported by Akkus (2010)¹⁵ which indicate that the power output during the 2nd pull phase is greater than that of the 1st pull phase. Additionally, the barbell vertical displacement that is greater in second pull, as noticed in the current study, is an indicator of an optimal explosive strength. This result of the study was uniform with the finding of Baumann et al., 1988⁴ who proposed that quick movement execution during second pull phase added to the explosiveness of the second pull.

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Review Article

Domestic Violence: With Emphasis on International Cultural and Societal Variations

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Abstract

Domestic violence is serious health and social problem that constitute an obstacle to nation's development and welfare through preventing women from enjoying their fundamental right and hindrance of their development.

Domestic violence is classified into three categories, physical violence (anything from pulling to use of fire weapons), psychological abuse and controlling behaviours (both range from shouting to verbal abuse and social and economic restriction).

Two major factors are responsible of domestic violence, the subordinate position of women in the society, and the social acceptance of violence as a method to resolve family conflicts. Then factors at the individual level stem from these two factors (e.g. poverty, age, poor education, alcohol). At the long time, there are grave health and social consequences for domestic violence.

There are emergency care measures to victims. Initially, the health setting should deal with the abused women as a health problem; then they should be referred to the concerned parties for support.

Prevention of domestic violence need implementing of multi-disciplinary programmes with participations of non-governmental organizations, governmental departments, legal authorities, medical profession, academicians, media and religious men to deal with the problem at all levels, individual, family and society. Major lines of DV prevention include women empowerment, and adopting measures to combat societal and individual and combating sociocultural norms that encourage violence against women (changing perceptions). Some issues in DV prevention strategies are relevant to men and should be addressed (e.g. alcohol, their concepts on masculinity and men's social roles). Research on domestic violence should be promoted and to allocate part of research fund to this topic.

Keywords: Domestic violence; Intimate partner violence; Dynamics of domestic violence

الملخص: العنف المنزلي هو مشكلة اجتماعية ذات علاقة بالصحة وهو يشكل عقبة أمام رفاه المجتمع وتنميته من خلال منع النساء من التمتع بحقوقهن الأساسي وإعاقة تنميتهم. ويصنف العنف المنزلي إلى ثلاث فئات هي العنف الجسدي (أي شيء من السحب وحتى استخدام الأسلحة النارية)، والإيذاء النفسي والسلوكيات المسيطرة (وهما يبدأان من الصراخ وحتى الشتم والتقييد الاجتماعي والاقتصادي). اثنتان من العوامل الرئيسية المسؤولة عن العنف المنزلي هما وضعية المرأة كتابعة في المجتمع، والقبول الاجتماعي للعنف كوسيلة لحل النزاعات العائلية؛ ثم العوامل المتجزرة على المستوى الفردي من هذين العاملين (مثل الفقر، والعمر، وضعف التعليم، والكحول). منذ وقت طويل، هناك مشاكل صحية خطيرة وعواقب اجتماعية ناتجة من العنف المنزلي. هناك تدابير رعاية طارئة لضحايا العنف المنزلي. في البداية، يجب على القطاع الصحي التعامل مع العنف المنزلي كمسألة صحية. ثم يجب إحالة الضحايا من النساء إلى الجهات المعنية للحصول على الدعم اللازم. الوقاية من العنف المنزلي في حاجة لتنفيذ برامج متعددة التخصصات مع الحاجة لمساهمات المنظمات الطوعية والدوائر الحكومية والسلطات القانونية، والطب، والأكاديميين، ووسائل الإعلام ورجال الدين للتعامل مع المشكلة على جميع المستويات المتمثلة في الفرد والأسرة والمجتمع. تشمل الخطوط الرئيسية للوقاية من العنف المنزلي تمكين المرأة، واتخاذ تدابير لمكافحة الأعراف الاجتماعية ومكافحة العادات الثقافية المجتمعية والفردية التي تشجع على العنف ضد المرأة (تغيير المفاهيم). بعض القضايا الاستراتيجية لمنع العنف المنزلي هي ذات الصلة بالرجل وبنبغي معالجتها (مثل الكحول، والمفاهيم حول الذكورة والأدوار الاجتماعية للرجال). ينبغي تشجيع إجراء البحوث العلمية الخاصة بالعنف المنزلي وتخصيص جزء من التمويل للأبحاث المتعلقة بهذا الموضوع.

What is domestic violence?

Violence, literally, is defined as behaviour toward another person which is outside the norms of conduct, and entailing a substantial risk of causing physical or emotional harm.¹ Common types of violence include war and war crimes such as rape and ethnic cleansing, state violence, politically rooted turmoil, street violence and violence against women (VAW). Violence against women (usually rooted on sex inequality), includes domestic violence, rape, harassment, forced prostitution, genital mutilations, early (child) marriage, sex selective abortion, wife inheritance, abuse of elder women, honour killing, acid throwing, economic restriction, forbidding employment, and state perpetrated violence (including laws that criminalize some women's dresses or their relations with men). The list of perpetrators in VAW

is too long including, for example, spouses, parents, teachers, employers, religious men and policemen.

Domestic violence is the most common type of violence against women, as the victim is nearby to the abuser all the time. Synonyms of DV include domestic abuse, wife abuse, family violence, spousal abuse, intimate partner violence (IPV) and battering. The term 'IPV' should better be reserved for areas where men-women intimate relationships are allowed outside formal marriage, in 'unions' such as cohabitation and intimate partnerships. Some researchers used this term 'IPV' to describe unions that include sexual abuse in both formal marriages and other relationships.²

Domestic violence (DV) is a violence exerted toward the woman by a family member (most commonly the husband or the

intimate male partner).³ The WHO defined DV as acts of physical, sexual and emotional abuse by a current or former partner whether living together or not.⁴ The American Medical Association defines DV as a pattern of physical, sexual and/or psychological abuse by a person with whom the victim has had an intimate relationship.⁵ Some researchers favour using a broad definition for DV (by including omissions beside offending acts) to enable entry of wider social parties in the programmes against it, although this may lose its very descriptive nature.⁶ Some researchers, for the purpose of their works, use an operational definition of DV as that any act that is perceived as violent by the respondents.⁷ For the purposes of this article, the Authors use only the term 'DV' to avoid using the term 'IPV' that imply presence of an intimate partner other than the 'husband', which is not accepted in many cultures throughout the world, whereas the term 'DV' is a neutral term and is not connected to type of man-woman union.

Rarely the husband can be the victim, or both partner (mutual violence).⁸ In some cultures with extended families, the source of violence may be the father, brothers or even other first degree relatives (in-laws). But, nevertheless, the husband is the more likely the abuser rather than other parties.

Domestic violence: global magnitude

The international attention to DV had started since the first report about battered women appeared in early 1970s.⁹ Domestic

violence occurs in all ages, cultures, races, socioeconomic classes, religions and crosses all geographical boundaries.

The prevalence of DV varies between 40% in American and British studies, and 45% in African and Asian studies.^{6,10,11} There is an impression that one third of women attending general practices had experienced violence.¹² In Egypt, Palestinian lands, Israel and Tunisia one in three women are abused by their husbands.⁷ In rural Vietnam, the prevalence of lifetime DV reaches 31%.¹³ In Iran, a study indicated that the prevalence of physical violence is 15%, whereas that of psychological abuse had reached 82%.¹⁴

In general, according to the WHO multi-country study, the prevalence of physical domestic violence in most countries is 23-49%.¹⁵ The lowest rates of DV were reported from Japan, whereas the highest were reported from Bangladesh, Peru and Ethiopia.¹⁵ Prevalence rates in developed versus developing countries varies between 28% and 67%.¹⁶

We observe that DV is not considered a major public health problem in the Third World, receiving only a small public and formal attention (although the studies revealed a lifetime prevalence that exceeded 40%).^{1,16}

Patterns of DV

The patterns (forms) of DV are classified into three major categories, physical violence, psychological abuses and controlling behaviours (Table 1).

The physical abuses include wide ranges

of assaults ranging from pushing or pulling the victim, to use of weapons. Anything from a mild pain to death may result from physical injuries (e.g. wounds, haematomas, abrasions, fractures, burns and scalds, dental injuries, jaw injuries, oral soft tissues injuries, homicide).¹ Physical abuses include sexual abuses such as forcing wife to sexual intercourse, coercing (forcing) sexual acts and marital rape; it results in unintended pregnancies, abortions, adverse pregnancy outcomes (such as low birth weight or perinatal death, maternal morbidity or even mortality) and sexually transmitted diseases.¹

Psychological abuses include verbal abuses, criticizing wife at public in a humiliating way and threatening behaviors (throwing things, threatening with a fist, threatening to injure the children, threatening with a weapon, threatening with divorce or remarriage).

The controlling behaviors include shouting or yelling at her, criticizing her in public, restricting her social life, checking her movements (being stalked) and keeping her short of money.

There is an overlap of the different types of DV especially psychological abuse and controlling behaviors (both are considered as an attempt to control the abused partner).¹⁷ But we think it is better to be taken in separate, as the degree of severity of psychological abuse is much more than controlling behaviors. Anyhow, the psychological abuse and controlling behaviors are considered the commonest.¹³

Theoretical basis of domestic violence

Although the DV is linked to certain

demographic and socioeconomic correlates, but no family is exempted from the possibility of its occurrence. It can occur even in a normal appearing life of spouses with significant professional success. In fact DV can occur in all religions, social classes, races, economic backgrounds and geographical boundaries.

Theoretically, DV is a product of the interaction of factors at four levels, individual, family, society and community levels.^{18,19} At the individual level, DV is determined by husband's abuse as a child, witnessing violence at home, having an absent or rejecting father, poverty and frequent use of alcohol or drugs. Factors at the family level include marital conflicts and dominant male control of wealth and family issues. In certain societies (especially in the Third World), marriage is a whole family affair, and its interests to family should be considered prior to the individual options (family may have a veto on the future wife). The societal factors include lack of support and isolation of family and women. At the community level, DV is determined by linkage of the concept of masculinity to male honour or dominance, acceptance of violence as a way to resolve conflicts, social tolerance of physical punishment of women and prevalence of some religious concepts that favours male supremacy and confers on men the right to correct their 'erring' wives.

In many societies, the above mentioned factors result in the current subordinate position of women and the unfair 'family order'. Thus, men are families' masters, and women should 'serve' them and to

show obedience. Violence, then, occurs on breaching these roles.^{1,20-21}

Abusers, usually, tend (or pretend) to be 'perfectionist' and also demand 'perfection' from their surroundings. This area of their personality may serve them to justify their violence toward their wives. Abusers, commonly exert controlling behaviours, are usually jealousy and tend to accuse their partners of flirting or extramarital sexual acts. This may be due to their poor self-esteem; on the other hand, he 'learned' that emotional abuse and physical violence get him what he wants.

Causes and risk factors of domestic violence

In Table 2, we list the possible causes and risk factors for occurrence of DV. In DV studies, there is an overlap between concepts of cause and risk factor, but in this article they are taken with the same significance.

In the presence of the risk factors or susceptibility to DV, very minor or 'absurd' things can trigger an immediate violent episode, e.g. talking back, not having food ready on time, refusal of sex or suspicious behaviors (Table 3). We notice that there is an overlap between some triggering and risk factors.

Age is a known risk factor for DV, with young women are more susceptible to assaults. In a study by the first author (AMA), the high gap in wife-husband age was found more significant than absolute wife's age as a determinant of violence.¹

Poverty is an important risk factor for DV. It is more frequent and severe among poor families. But affluent families are not exempted. The link between poverty and violence is, usually, through stress generation.¹ ² In some situations there is income inequality between husband and wife within the family net poverty, e.g. when the wife is working and the husband is unemployed, or when her income is higher; this factor is thought to be a source of violence.

Alcohol (especially problem drinking) is linked to DV. Alcohol reduces both inhibitions and ability of judgment. A relevant source of violence is argument about alcohol drinking, especially when affects family's budget or professional performance of the husband.² Some abusers knows that the society may accept the excuse that alcohol or drug by lowering the inhibitions may 'urge' them to be violent.

The in-laws can be a source of wife battering due to factors such as dislike of wife, miscommunications, husband's favouring of wife over parents, arguments, infertility, not having a male kid (a wrong belief that the mother is responsible of the child's sex).⁷ The presence of inlaws, or even the large number of kids resulting in crowded homes provide a suitable environment tensions and conflicts and then violence.² The crowded homes may lead to overburdening the domestic work on the wife, as some of the inlaws may expect that their son's wife to be their servant. The competition between the wife and the in-laws on the attention of the husband may

generate violence. A similar situation occurs in polygamous families living in one home, where jealousy, suspicions and seeking preference of the husband lead also to violence.^{22,23} Even more, the large number of children is closely associated with DV even in nuclear families.²

Lack of social support and isolation of the wife leave her more susceptible to battering. Social support, e.g. from families, non-governmental organizations (NGO), governmental parties such as legal and welfare authorities is protective against DV. An early step in wife battering is tendency of abusive husbands to isolate wives and restrict their movements and contacts with the others. This is not only generating violence but increases its frequency and severity. These abusive husbands usually fear revealing and discussing their wives assaults with the 'strangers', so this further justified the usefulness of social support. Social support may be more useful through empowerment of women, through improving her education, income, community role and other forms of social support.^{22,23}

Educated women enjoy more autonomy, and usually are economically independent to a greater extent. In general, high educational attainment is associated with lower rates of DV. Educated women have a greater range of choice in partners. Also educated women are in a better position to control her income and the family's wealth. On the other hand less educated women are more likely to accept the traditional gender role that favour males'

supremacy.²⁴ But a point to be considered is that in many conservative societies that favour male dominance, the relatively liberal ideas of educated women may leave them at a greater risk of violence.² Then, education can be a protective and a risk factor for DV in certain conditions.

Witnessing of violence within abusers and victims' parental families is an important determinant of DV. It leads to its normalization as a way of conflict resolution. Then, this concept passes from generation to generation.²⁵

There is a debate on the effect of urban/rural residence on prevalence of DV. The WHO multi-country study indicated higher rates of violence occur in rural areas.¹⁵ But some studies indicated higher rates in urban areas.²⁵ This may underlie some failure in coping with values and stresses of urban life. As well, the conservative rural societies may lead to under-reporting cases of violence due to their acceptance and tolerance of marital assaults.

Some health conditions and problems have some relevance to DV. Women with chronic diseases such as diabetes mellitus and hypertension are vulnerable to violence due to diverting part of the family's budget to their care, and by inadequate home care due to their diseases.²⁶ Association of pregnancy to DV was mentioned elsewhere in this article.

Responses of victims

Domestic violence is, nevertheless, a crime and constitutes a violation of human rights,

and should never a part of normal marital relationships.

Usually the women are 'sustained' victims of DV because they are physically weak, their dependent status, the social tolerance of women abuse and the private domain that violence occurs in. Domestic violence is pervasive; involving several life aspects of abused women and evolves slowly over a long period of time. Once it is established, it becomes a chronic phenomenon and part of the life regular events of the abused women. The abusers, usually, tend to limit avenues of escape for their victims.

The response of the victim to assaults varies according to different individual and socioeconomic factors. A large number of the victims, especially in developing countries, opt to remain silent, and then stay in the abusive relationship. This is usually due to lack of autonomy (resulting from poverty, lack of professional skills or poor education), fear of social stigma, fear of violence escalation, feeling that disclosure of violence is unhelpful, adoption of societal norms of the husband's right to beat his wife, feeling shame or embarrassment that they are battered, feeling that her children need a father however bad. Abused women tend to develop conflict avoiding personality in a trial to avoid anger and problems with the side of her partner. The conflict avoiding behaviour may extend outside the family to friends and coworkers. The net resultant is tightening of the social isolation (which is in itself a risk factor for violence initiation or escalation).

Other responses include seeking medical help, approaching a family member, seeking help from NGO or police or considering leaving this 'bad' relationship (divorce). But what is frustrating is that divorce may generate more violence by stalking or even murder.² In North America, there is a high prevalence of severe violence among divorced women, more than other communities.²

What is worse than DV is the acceptance of women at some cultures of it as a method for punishment or discipline for married women. Some abused wives saw so much violence in their lives before marriage, and she might think that this is normal. In African studies, percentages of women's justification for their battering by husbands range from 66% in Nigeria to 90% in rural Uganda.^{27,28} The situation in Middle East and Asia is similar.¹¹ Even more, the abused wives, at times, are blamed as being 'disobedient' or failing to satisfy her husband as a 'good' wife. Some studies indicated that factors associated with women's acceptance of violence include disempowerment, fear of divorce, younger age at marriage and rural residence.¹⁶

Some wives who realize the criminality of wife abuse fear the punitive actions of husbands or their families if they decide to go to the police, or ask for divorce, as they may lose their children. A large proportion of them are unable to lead an independent life to their limited resources.

Sequelae of DV

Apart from the immediate results of DV such

as physical injuries or acute psychological reactions, there are long term sequelae.²⁹ Physical disabilities due to severe assaults, such as weakness or blindness may occur. Psychiatric conditions such as anxiety, depression and suicidal thoughts and attempts are commonly encountered.² Unexplained chronic health problems, e.g. fatigue, abdominal pain, post-traumatic stress disorders may occur and warrant screening for occult DV in appropriate cases.³⁰

Not only physical or mental health that deteriorates with DV, but other life aspects are affected. Some victims may suffer lack in confidence, poor self-esteem and distorted self-image. Victims capitulate to the abusers' demands through isolation, fear, shame and insufficient financial resources. Marital conflicts amounting to divorce may escalate with continuity of abuse. Hindrance of women's participation in the social and economic well-being of the society occurs due to poor social skills and failure to create and maintain normal social relations. Even children of abuse families are not immune of sequelae of DV, such as dis-regulated aggressions from early age, disturbed sleeping, nightmares, constant waking, enuresis and fear of the dark.³¹

Domestic violence in medical practice

Domestic violence is a real public health problem.³²⁻³⁴ The clinician may be the first professional contact for DV victims.³⁵ And at times may be the only contact. All body systems and both physical and mental healths

are affected by DV, in a wide spectrum, from pain to severe burns and even physical disabilities. Both short and long term health consequences are expected to occur; at times can be a life threatening event. Some studies indicate that 1 in 10 up to 1 in 5 women attending emergency departments have problems related to DV.³⁶ Some unexplained medical problems such as chronic headache, fatigue or abdominal pain are linked to DV.³⁰ Other medical problems associated with DV include sleeping disorders, malnutrition, eating disorders, panic attacks, self-neglect and sexual dysfunctions. Pregnancy is reported to increase the risk and pattern of assaults to women due to associated hormonal and psychological changes that may depress her mood and activity. Then violent actions can be initiated by even minor events. In conclusion, the similarity of DV relation to health is as the similarity smoking relation to ischaemic heart disease. In conclusion, due to inter-relationship of DV with other medical problems, care for abused women should be integrated into existing health services rather than as a stand-alone service.³⁵

In clinical practice, the commonest cause of missing a case of DV is, merely, not to ask about battering, or even not be put it as a possibility. Simply, this is due to that health personnel are not taught or trained to identify, support or refer DV victims; so it is important to take a good medical history as it is an important tool to discover cases.³⁷

There are several factors in the clinic setting that may suggest presence of abuse and should

be noted by the examining doctor. Usually, there is a delay between time of injury and time of presentation to medical care (patient is unable or unaffordable to leave home by public transportations). There is a tendency to self-treatment of injuries. The victim is, usually, young, with an increased age gap compared to husband; appears depressed, with poor eye contact, withdrawn or fearful of visitors and caregivers. The husband often accompanies victim, refuses to leave the patient alone and may insist to answer questions for the patient.³⁸ There is a history of multiple visits to emergency departments, with repetitive complaints inconsistent with organic disease and prevalence of psychosomatic symptoms secondarily to depression or anxiety. Physical injuries are usually bilateral at multiple sites and with fingernail markings scattered on the body.

There are several barriers of efficient case taking of abused patients. Patients are non-compliant to appointments. Some doctors tend to blame the victims (may be themselves adopt the common social norms that tolerate DV). The patients may be questioned in an inappropriate manner. An important barrier is the low index of suspicion of DV by many doctors, and then DV is not considered in differential diagnosis of suspected cases, leading to failure or delay of the diagnosis. The DV as a differential diagnosis is usually not considered by doctors because the abusive husbands appear concerned and attentive when accompany victims to medical care

Considering DV as a health problem carries

several advantages. Health settings are the first place, and may be the only one that DV victims attend. The private nature of the medical encounter encourages victims to reveal their problems. The public health approach usually adopts epidemiological methods that investigate victims and abusers' characteristics, and circumstances and reasons of violence.

Thus, the public health approach provides a good basis to implement prevention programmes.

Unfortunately, there are several shortcomings that prevent the medical profession from significant contribution in handling the problem of DV. The medical professionals are unaware of nature and extent of DV even as social problem.³⁹ Some even do not recognize DV as a health problem. Medical professionals are unaware of their role to help the victims of DV, thinking that their role is limited to treatment of the bodily manifestations.³ Even the doctors who realize occurrence of DV may fear involvement in prolonged court proceedings. Some doctors may share the society misconceptions that DV is rare, or a private matter, then fear offending women if ask them about husband's abuse. Even some doctors may erroneously label victims as hypochondriatic or hysterical.³⁹ Doctors' unawareness of social and psychological dimensions of violence leads to its escalation. There is a lack of teaching and training on DV in medical schools. The unprepared or uninterested doctors are harmful by minimizing abuse and then

increase victim sensation of entrapment and helplessness.³⁹

Management of domestic violence

Domestic violence is not a simple health problem like chest infection that needs a short medical encounter and prescribing a drug to be treated for good.⁴⁰ It is a complicated health problem with socioeconomic and cultural dimensions that should be properly addressed, beside, of course, to organic and mental associated problems. For this reason, we better adopt the concept of 'management' rather than 'treatment' to include these aspects in its handling.

First, due to the special nature of cases of DV, there are some prerequisites to be fulfilled for an efficient management of DV victims. A private and save environment should be secured for the encounter, as the victim is reluctant to speak or disagree in the presence of his partner. The examiner should ask simple questions in a neutral manner that does not justify the abuse. The patient should be respected, cared of and listened to, in a safe environment and ensuring him that she is not at fault. The clinician should avoid certain behaviors such as judging, pitying, blaming and trivializing.⁴¹

Emergency medical care for DV victims is a top priority, e.g. emergency, surgical and medical treatment of physical injuries, involvement of all medical departments when needed, e.g. obstetrics, orthopaedics, physiotherapy, dental departments. A psychiatric consultation is needed in some

cases for mental status assessment, and screening for suicidal thoughts and attempts.

Next step in management of DV is to help the victims to access social support, or referring them to colleagues with better knowledge on such areas. For this reason part of the medical encounter should be devoted for asking about (and observing) the risk factors for abuse, as their knowledge may help further supporting the patient, e.g. poor educational level, poverty, unemployment, alcohol and drug abuse by the perpetrators

Prevention of domestic violence

The DV preventive strategies need implementing of a multidisciplinary programme with participations of medical profession, governmental departments, NGOs, legal authorities, academicians and religious men. The preventive programme should raise the governmental and public awareness to the occurrence of DV in the community and to provide medical, moral, legal and social support to victims. Raising awareness of the society to DV as a crime is important as, still, there are some social sectors that considering wife battering as a social norm or a personal issue (then others should not 'interfere').

Changes in the health system should be encouraged for better services to battered ladies, through training of all personnel, and issuing a multidisciplinary guideline to help in identification, treatment, counseling and prevention of DV.

In particular to train health personnel to have a high index of suspicion to suspect

and screen for cases of DV victims. Health service settings, by providing a private and confidential environment and easy accessibility for battered woman is an ideal place to establish preventive activities. Services of DV cases need not to be separated from the general clinics, but to be incorporated with them, as this may serve to label DV as a health problem and encourage abused women to attend.

A dual approach in preventive strategies is necessary, through women's empowerment to improve their status in the society, and through combating sociocultural norms that encourage violence against women (changing perceptions).¹⁶ Empowerment of women can be initiated through education, participation in domestic decision making and to have a control over her income. Not only basic education to be available to all girls, but to include concept of gender equality and to remove any material that degrade women in its curriculae. University curriculae need revisions to include DV as a teaching and training topic for both under- and postgraduate students, especially in medical and social and human sciences schools. Modern banking assistance programs such as microfinance loans can be utilized to empower women from poor backgrounds.

Media (including social media sites in the Internet) can initiate debates to criminalize DV, and support campaigns against DV, and can encourage women empowerment in their societies. The media can get use of modern and elegant presentations such as soap opera,

educational drama, community theatre and talk show programs. The media can support DV prevention by reducing portrayal of violence against women in its programs.

Steps to protect victims are needed, such as providing shelters, support of children, criminalization of DV and tightening of legal measures against abusers.

Strategies to prevent DV should address both wife and husband. For example, addressing education or income empowerment in women only, may result in a gap between the spouses that will be a source of more violence. Some issues in DV prevention strategies are relevant to men, and should be addressed and to including them (e.g. alcohol problem drinking, cultural roots of their controlling behaviors). This will explore men's behaviors, and discovers motivations necessary to secure success of preventive programs.

The preventive programs should be tailored according to situational societal and cultural concepts on women's roles and rights, and to type of DV, as there are significant differences between them, in reference to risk factors and characteristics of abusers and victims. Always difficulties are expected in such programs that address a longstanding multi-factorial problem. For example, women's acceptance, and even justification, for wife battering in some cultures is a great obstacle to prevent DV.

Scientific research and domestic violence

Scientific research on DV is an important step for preventive programs. A great difficulty

of research in DV is its sensitivity, as a topic, in many cultures. In some societies, DV is not considered an appropriate topic to be discussed with 'strangers'.²⁴ Due to sensitivity of the DV in many cultures, the responses obtained may not reflect the true situation. Sensitivity of the DV issue may lead to prevalence underestimation in research studies. For this sensitivity, facilities such as health settings secure a confidential place for respondents. Most of studies on DV are designed as facility-based and not community-based studies. This will generate a shortcoming that it is difficult to generalize their results for the whole community as only a small portion of the targeted population attends facilities at one time. Community-based studies are, also, useful in providing reliable data on prevalence, frequency, patterns of DV.

The wide variations in obtained prevalence rates of DV may reflect major methodological shortcomings in tackling this problem.⁴² Studies on men are useful to assess causes of DV and the impact of intervention programmes.⁴³ The private and intimate context where DV occurs poses further difficulties to study it.

Although the psychological abuse is the commonest of the DV patterns, but receives less attention from researchers.⁴⁴ This may be because physical violence is easier to define and measure, unlike psychological abuse and controlling behaviors. Even more, verbal abuses such as humiliations may not be perceived as an abuse by some women.⁶

Some steps in research should be carefully managed for more observance of respondents' safety and confidentiality.⁴³ For example, it is better to interview respondents in private rooms, with no other persons present, or can see or hear. In Interviewers, in some culture are better to be female, especially nurses, midwives or social workers to ensure respondents' trust and confidence. A verbal consent is preferred to a written one, as the latter may lead to identification of the respondent and may threaten her safety. For purpose of surveys, each country should issue a questionnaire tailored to the local societal and cultural norms. In particular, operational definitions are needed for more validation of questionnaires and other tools of data collection.

Points of strengths of research on DV include the community-based design, large size population, random sampling techniques, training of data collectors on interviewing techniques, choosing data collectors from sectors that are trusted by women such as midwives and nurses (this secure high response rates), use of validated questionnaires tailored according to local norms and cultural concepts on family and DV. The context of the interview, and the researcher's interviewing techniques should be considered as both may affect the validity of gathered data.

Key issues 1

Patterns of domestic violence

I. Physical abuses

Hitting, shoving, slapping, pushing, pulling, shaking, punching, choking, kicking her on the floor, holding, binding, arm twisting, pulling hair, tripping, biting, burning, use of a weapon, forcing wife for sexual, intercourse (marital rape), coercion of certain sexual acts unaccustomed or unacceptable to the wife

II. Psychological abuses

Threatening of physical harm, anger, yelling, false accusation, blaming wife when bad things occur to husband or family, intimidation, humiliation, degradation (make her feel bad of herself), economic restrictions (keeping partner short of money, prevent her from work, prevent her from controlling her earnings or dowry, property damage)

III. Controlling behaviors

Not taking wife's opinion on family issues, husband gets angry on wife when speaking to another man, husband insists to know her movements and whereabouts, restriction of wife contact with her family or friends, suspicions of wife's unfaithfulness

Key issues 2

Causes of Domestic violence

A. Wife's Demographic factors

Low educational level

Young age at marriage

No or low educational level

Having educational level higher than the husband

Low socioeconomic status (poverty)

Rural/urban residency

B. Sociocultural norms degrading women's status

- Societal tolerance of women's beating
- Societal tolerance of physical punishment of women

- Societal Acceptance of violence as a way to resolve conflicts

- Wife acceptance of battering as a punishment method

C. Adverse family environment

Crowded family (living with in-laws, large number of children)

Conflicts with in-laws

Overburdening domestic works

D. Wife denied of power

Control of wife's income or dowry

Denying wife's decision of family issues

E. Personal factors

Pregnancy

Witnessing violence at childhood

Use of alcohol

Infertility

Refusal of sex

Wife's isolation (lack of family and social support)

F. Husband's factors

Wife's wide age gap

Poverty
 No or low educational level
 Unemployment (or its instability)
 Use of alcohol or illegal drugs
 Polygamy
 Conflicts on family planning
 Preference of sons
 Sexual problems

Key issues 3

Immediate (triggering) factors for violent events

- Argument with husbands (e.g. talking back)
- Negligence of home
- Quarrel with children
- Negligence of children
- Not having food ready on time
- Refusal of sex
- Suspicious wife's behaviors
- Wife's going out without permission

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A Two Homozygous Mutations in DOCK8 Gene in Saudi Infant with Hyper IgE Syndrome.

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ABSTRACT

Hyper IgE syndrome (HIES) is a form of primary immunodeficiency associated with eczema, sinopulmonary infections, and elevated serum IgE. The majority of cases are sporadic but autosomal dominant and recessive forms are identified. We report a one year old Saudi girl with a two homozygous mutations in DOCK8 Gene.

الملخص: تعتبر متلازمة فرط الأجسام المناعية (إي) نوع من أمراض نقص جهاز المناعة الأولي والتي يصاحبها التهاب الجلد التأتبي والتهابات الجيوب الأنفية والرتتين مع ارتفاع في مستوى الأجسام المناعية (إي) (IgE) في الدم. أغلبية الحالات المصابة ناتجة عن طفرات فردية ولكن هناك حالات ناتجة عن اضطرابات صبغية جسدية سائدة ومنتحية. هنا نعرض حالة طفلة سعودية لديها متلازمة فرط الأجسام المناعية (إي) وتحمل طفرة وراثية نادرة لم يسبق وصفها من قبل في مورثة الصفات المسماة (DOCK8).

Introduction

Hyper Immunoglobulin E Syndrome (HIES) is a rare immune deficiency disease due to mutations in the signal transducer and activator of transcription-3 (STAT3) (chromosome 17, MIM=147060), Dedicator of Cytokines 8 (Dock-8) (chromosome 9, MIM=243700) and Tyrosine Kinase-2 (TYK2) (chromosome 19, MIM= 611521) genes. The incidence of the syndrome is about 1/10000 to 1/200000.[1] It is characterized by recurrent skin and chest infections, atopic dermatitis and elevated serum IgE concentrations. [2-3] Autosomal dominant form is more common than autosomal recessive.[4] HIES symptoms that usually appear in the infancy are characterized by eczema, recurrent

infections like skin abscess, sinusitis, otitis media, and pneumonia. The diagnosis of HIES is based on symptoms determining of mutation. Treatment of this syndrome include prophylactic antibiotics ,management of infections, and skin care measures. Hematopoietic cell transplantation (HCT) is the last and definitive therapeutic method. [5] Here, we describe a 1 year old Saudi female infant with hyper IgE syndrome. The patient was shown to have two homozygous mutations in DOCK8 gene that not reported before.

CASE REPORT

We report the case of one year old girl infant who was born for consanguineous

parents with no family history of immunodeficiency. She was admitted to our hospital at age of one year because of fever, cough, and shortness of breathing. The patient had generalized scaly erythematous skin rash which involve the whole body include the scalp. She had recurrent chest infections and atopic dermatitis.

The physical examinations revealed well looking ,mildly dehydrated, tachypnic and febrile child. She had generalized erythematous maculopular skin rash with scaly apperance. Chest examination was showed decreased air entry bilaterally with expiratory wheezes. There were no lymphadenopathy, hepatomegaly or splenomegaly. Overall, the other parts of the exam were unremarkable.

The initial CBC was showing the following results: WBC count of $25.1 \times 10^9/L$, of which the neutrophil count was $12 \times 10^9/L$, lymphocyte count was $6.6 \times 10^9/L$, and eosinophil count was $5.6 \times 10^9/L$. Hemoglobin count was 12.2 g/dl and the platelet count was $1053 \times 10^9/L$. Lymphocyte marker revealed an absolute lymphocyte count of $4.48 \times 10^9/L$ absolute CD3+ $2.17 \times 10^9/L$ (48%), absolute CD4+ $1.54 \times 10^9/L$ (34 %), absolute CD8+ $0.63 \times 10^9/L$ (14 %), absolute CD19+ $1.61 \times 10^9/L$ (35%), and absolute CD+ $1.6/CD+0.6$ $1.09 \times 10^9/L$ (14 %). IgG, IgM, and IgA were normal with very high serum IgE levels > 5000 Ku/L.

The patient's Blastogenesis showed marked depression in lymphocytes response to phytohemagglutinin (RR 37%), and

concanavalin A (RR 45%),normal response to pokeweed mitogen (%RR 87%) and mild depression in lymphocytes response to pooled allogeneic cells (RR 66).The sequence analysis of DOCK8 gene has identified the following mutations :

D N A Change:	<p>Mutation 1:</p> <p>Homozygous mutation for c.4346 C>T From Variant one (ENST00000453981)</p> <p>Mutation 2:</p> <p>Homozygous mutation for c.4626+5 G>A From Variant one (ENST00000453981)</p>
Protein Change:	<p>Mutation 1:</p> <p>S1449L</p> <p>Mutation 2:</p> <p>Splice Site Mutation at position5 after the end of exon 45.</p>
Predicted affect on gene/gene function	<p>Mutation 1:</p> <p>A change from a conserved hydrophilic polar (S: Serine) To hydrophobic nonpolar (L: Leucine). Expected to be not a pathogenic change as predicted by PolyPhen-2.</p> <p>Mutation 2:</p> <p>Conserved Splice Site Mutation. The effect of the splice site mutation has not been determined. However, no DOCK8 protein was detected by western blot. The absence of the DOCK8 expression is significant and is expected to lead to be pathogenic of HIGe.</p>

these changes have not been reported previously. The patient has been treated with broad spectrum antibiotics and intravenous hydration. She has been improved clinically and discharged on prophylactic antibiotics.

She had a full match donor (her sister). She has been referred to higher medical center for bone marrow transplantation that has been done successfully there. She has a good health status after the transplant with regular medical follow up.

DISCUSSION

Hyper IgE syndrome (HIES), first defined in 1966 by Davis[6]. HIES is a multisystemic disorder characterized by eczema, recurrent pulmonary and skin infections and markedly increased levels of serum IgE. Most of the cases occur sporadically. Autosomal dominant form is caused by mutations in STAT3 identified in 2007,[7] presents with skeletal, connective tissue, and pulmonary manifestations by whereas, Autosomal recessive form is caused by mutations in DOCK8, identified in 2009, presents with severe dermatitis, and recurrent skin infections. [8]

The differential diagnosis of Hyper IgE syndrome (HIES) include other immunodeficiency diseases that associated with elevated IgE levels such as Wiscott-Aldrich syndrome, Omenn syndrome, atypical complete DiGeorge syndrome, Netherton syndrome and immune dysregulation, polyendocrinopathy and enteropathy X-linked (IPEX) syndrome. [9]

To diagnose classical Autosomal dominant-HIES a scoring system has been proposed.[10] In the presence of significantly high IgE level combined with lung or cutaneous infections. it may be relevant to

perform genetic testing for STAT3 mutations. In certain cases of autosomal recessive-HIES, examining for DOCK8 or Tyk2 mutations may be considered.[11,12]

In Saudi Arabia, there were several cases of Hyper IgE syndrome (HIES) reported to have mutations in DOCK8 gene. This is the first report in the literature showing a two homozygous mutations that have not been described before. In DNA, first mutation for c. 4346 C>T and Second one for c. 4626+5 G>A. Protein changes in first mutation is S1449L and in other one is splice site mutation at position 5 after the end of exon 45. Effect of the first mutation on gene function tend to be not a pathogenic as predicted by polyPhen-2 but in second mutation, there was NO DOCK8 protein detected by western blot that expected to result in Hyper IgE syndrome (HIES).

Our patient is presented with diffuse scaly erythematous skin rash, recurrent chest infections, and eczema since age of one year. The white blood cell count was elevated with eosinophilia and the IgE level was very high. Blastogenesis showed marked depression in lymphocytes response to phytohemagglutinin and concanavalin A, and mild depression to pooled allogeneic cells.

CONCLUSION

Hyper IgE syndrome (HIES) is a rare primary immunodeficiency . many gene mutations have been discovered recently. The identification of STAT3, DOCK8, and TYK2 mutations has a major role in the diagnosis and treatment for affected

individuals. Early diagnosis of Hyper IgE syndrome (HIES) is very important to initiate appropriate management. After all, Genetic counseling should be considered for family future planning.

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MEDICAL QUIZ

DR. SYED MERAJ AHMED, ASSOCIATE PROFESSOR, COMMUNITY MEDICINE

1. A 65-year-old gentleman with type 2 diabetes mellitus is found incidentally to have left bundle branch block on his ECG. It had not been present on previous ECGs. An ECHO reveals no structural abnormality. You want to exclude a myocardial infarct. What investigation should be performed in the first instance?

- a. Exercise tolerance test
- b. Thallium perfusion scan
- c. Coronary angiography
- d. CT angiography
- e. Repeat ECG

2. A patient with a 6-month history of low mood and some suicidal thoughts is discussing her treatment options. Which of the following is the best pharmacological treatment?

- a. Fluoxetine
- b. Amitriptyline
- c. Selegiline
- d. Haloperidol
- e. Lorazepam

3. A 34-year-old female presents regularly with minor symptoms to her GP. She states her gut is sometimes very active and noisy and she is worried that she may have cancer. She has asked for further investigations to be performed. A colonoscopy reveals no abnormalities. She is not reassured by this. What is the most likely diagnosis?

- a. Somatization disorder
 - b. Body dysmorphic disorder
 - c. Hypochondriasis
 - d. Conversion disorder
 - e. Irritable bowel syndrome
4. Which of the following suggests damage to the oculomotor nerve (CNIII)?
- a. Inability to laterally deviate the eye on that side
 - b. The eye is deviated downwards and medially at rest
 - c. A light shone into the affected eye does not produce constriction of the opposite pupil
 - d. Ptosis of the upper eyelid on the affected side
 - e. Constricted pupil on the affected side

5. *A patient with previous history of cold sores presents with a painful right eye. On examination there is evidence of conjunctival injection in the right upper quadrant and this area is exquisitely tender. Fluorescein dye is applied and reveals a dendritic lesion. What is the most likely diagnosis?*

- a. Bacterial ulcer
 - b. Scleritis
 - c. Episcleritis
 - d. Foreign body
 - e. Herpetic simplex ulcer
6. How is the majority of cortisol metabolised and excreted from the body?
- a. Metabolised in liver and excreted in the urine as cortisol
 - b. Metabolised in liver and excreted in bile acids as conjugated metabolites
 - c. Metabolised in liver, metabolites conjugated and excreted in the urine
 - d. Metabolised in liver and excreted in bile acids as free cortisol
 - e. Hepatic metabolism

7. *Which of the following is a side effect which would be most likely to occur with the progesterone only pill rather than the combined oral contraceptive pill?*

- a. DVT
- b. Breast tenderness
- c. Depression
- d. Irregular periods
- e. Migraine

8. *A 26-year-old female presents to her GP after noticing her urine has been a dark brown colour. She admits to feeling increasingly tired over the last few months and has noticed herself bruising easily. Bloods reveal a low haemoglobin which is macrocytic. She also has low platelets and evidence of increased LDH, low haptoglobin and increased reticulocyte count. A dipstick reveals haematuria however microscopy does not reveal in red blood cells. What is the most likely diagnosis?*

- a. Paroxysmal nocturnal haemoglobinuria
- b. Folate deficiency
- c. Spherocytosis
- d. Autoimmune haemolytic anaemia
- e. Immune Thrombocytopenic purpura

9. *A 60-year-old female is suffering from back pain which has woken her from her sleep for the last few months. An x-ray reveals vertebral collapse and lytic lesions. She has also noticed feeling thirsty and has been more constipated. Bloods reveal a normochromic normocytic anaemia, thrombocytopenia, leucopenia, renal impairment and hypercalcaemia. What investigation will provide a definitive diagnosis?*

- a. MRI
- b. Serum protein electrophoresis
- c. Bone marrow biopsy
- d. Bence Jones protein
- e. Peripheral blood film

10. *A patient is undergoing a blood transfusion when she begins to feel feverish and unwell. She is tachycardic and hypotensive and is suffering from flank pain. Her coombs test is positive. What is the most likely diagnosis?*

- a. Transfusion related lung injury
- b. Febrile non haemolytic reaction
- c. Acute haemolytic reaction
- d. Bacterial contamination
- e. Sepsis

Key Answers:

1: (a), 2: (a), 3: (c), 4: (d), 5: (e), 6: (c), 7: (d), 8: (a), 9: (b), 10: (c)

CONFERENCES 2016

<i>no</i>	Conference	Date	Place
1	Public health Conference	July 2026 11-13	Kuching, Malaysia
2	PSCP 2017. 10th Annual poverty and social protection conference	9-11th March 2017	Bangkok, Thailand
3	International conference on Biotechnology Food Science and Pharmaceutical Research	August 2016 5 - 3	Kuala Lumpur, Malaysia
4	MR2017. second international conference on Multidisciplinary Research	7th January 2017	Colombo , Sri Lanka
5	International conference of life style management 2017	4th February 2017	Bhuarnower-India
6	Seventh international Conference on Health wellness and Society	5th of October	University of Denver, USA
7	47th Union World Conference on Lung Health	October 2016 25-29	Liverpool, UK

GUIDELINES FOR MANUSCRIPT PREPARATION

A. TYPES OF MANUSCRIPTS

I. ORIGINAL MANUSCRIPTS

Manuscripts submitted in this category are expected to be concise, well organized, and clearly written. The maximum length is 5000 words, including the abstract, references, tables, and figure legends. The maximum length is 5000 words, including the abstract, references, tables, and figure legends.

- The structured abstract must not exceed 250 words.
- The title must not exceed 130 characters.
- A maximum of 4 tables and 4 figures is allowed.
- References should not exceed a maximum of 100.
- The abstract must be organized as follows:
 - Background & Aims
 - Methods
 - Results
 - Conclusions
- Do not use abbreviations, footnotes or references in the abstract.
- An electronic word count of the abstract must be included.
- Three to ten key words at the end of the abstract must be provided.

The manuscript must be arranged as follows:

- Title page
- Abstract
- Introduction
- Materials and methods (or Patients and methods)
- Results
- Discussion
- Acknowledgements
- References
- Tables
- Figure legends
- Figures

Acceptance of original manuscripts will be based upon originality and importance of the investigation. These manuscripts are reviewed by the Editors and, in the majority of cases, by two experts in the field. Manuscripts requiring extensive revision will be at a disadvantage for publication and will be rejected. Authors shall be responsible for the quality of language and style and are strongly advised against submitting a manuscript which is not written in grammatically correct English. The Editors reserve the right to reject poorly written manuscripts even if their scientific content is qualitatively suitable for publication. Manuscripts are submitted with the understanding that they are original contributions and do not contain data that have been published elsewhere or are under consideration by another journal.

II. REVIEW ARTICLES

Review articles on selected clinical and basic topics of interest for the readers of the Majmaah Journal of Health Science will be solicited by the Editors. Review articles are expected to be clear, concise and updated.

- The maximum length is 5000 words, excluding the summary, references, tables, and figures.
- References should not exceed a maximum of 150.
- The inclusion of a maximum of 4 high-quality tables and 4 colored figures to summarize critical points is highly desirable.
- Review articles must be accompanied by a title page and a summary.

- Reviews should include at least one Key Point Box, with a maximum of 5 bullet points, that briefly summarizes the content of the review.

Review articles are reviewed by the Editors and may be sent to outside expert reviewers before a final decision for publication is made. Revisions may be required.

III. EDITORIALS

This section consists of invited brief editorial comments on articles published in the Majmaah Journal of Health Science

The length of an editorial should not exceed 1500 words, excluding references.

- A maximum of 1 table or 1 figure is allowed.
- References should not exceed a maximum of 20.
- A title page must be provided.

IV. CASE REPORTS

Case reports would be only accepted if they represent an outstanding contribution to the Etiology, pathogenesis or treatment of a specific condition.

- The maximum length is 3000 words, including the summary and references.
- A maximum of 2 tables and 2 figures is allowed.
- References should not exceed a maximum of 15.
- A title page must be provided.

V. LETTERS TO THE EDITOR

Letters to the Editor will be considered for publication if they are related to articles published in recent issues of Majmaah Journal of Health Science. Occasionally, Letters to the Editor that refer to articles not published in Majmaah Journal of Health Science will be considered.

The length of a Letter to the Editor should not exceed 800 words.

- A maximum of 1 table or 1 figure is allowed.
- References should not exceed a maximum of 10.
- No more than 4 Authors may appear in the author list.

VI. COMMENTARIES

International commentaries will be solicited by the Editors only.

- Commentary articles should not exceed a maximum of 800 words, excluding tables or figures.
- A maximum of 1 table or 1 figure is allowed.
- References should not exceed a maximum of 10.
- A title page must be provided.

B. MANUSCRIPT SUBMISSION

ORGANIZATION OF THE MANUSCRIPT

- The submitted manuscript must be typed double-spaced throughout and numbered (including references, tables and figure legends). Preferably using a "standard" font (we prefer Times/Arial 12).
- For mathematical symbols, Greek letters, and other special characters, use normal text. The references must be in accordance with the Vancouver reference style (see References).
- Approved nomenclature for gene and protein names and symbols should be used, including appropriate use of italics (all gene symbols and loci, should be in italics) and capitalization as it applies for each organism's standard nomenclature format, in text, tables, and figures.
- Full gene names are generally not in italics and Greek symbols are not used. Proteins should not be italicized.
- Improperly prepared manuscripts will not be entered into the peer review process and will be sent back to the author for correction.

TITLE PAGE MUST CONTAIN:

- A title of no more than 130 characters.

- Running title (not to exceed 60 characters)
- Names of the Authors as it should be published (first name, middle initial, last name)
- Affiliations of all authors and their institutions, departments, or organizations (use the following symbols in this order to designate authors' affiliations: *, †, ‡, §, ¶, ||, #, **, ††, ‡‡, §§, ¶¶, || ||, ##).
- Name, address, telephone and fax numbers, and electronic mail address of the corresponding Author.
- Electronic word count.
- Number of figures and tables.
- List of abbreviations in the order of appearance.
- Conflict of interest.
- Financial support.

Animal trials: Manuscripts reporting experiments using animals must include a statement giving assurance that all animals received human care and that study protocols comply with the institution's guidelines. Statistical methods used should be outlined.

Human trials: Manuscripts reporting data from research conducted on humans must include a statement of assurance in the methods section of the manuscript reading that:

1. Informed consent was obtained from each patient included in the study and
2. The study protocol conforms to the ethical guidelines of the 1975 declaration of helsinki as reflected in a priori approval by the institution's human research committee.

Randomized controlled trials: Any paper that is a randomized control trial should adhere to the guidelines that can be found at the following web-site: www.consort-statement.org. The checklist should be printed out and faxed to the Editorial office at the time of submission. The trial registration number must be included on the title page of the manuscript reporting a registered clinical trial. Failure to do so will prevent entry to the peer review process.

Drugs and chemicals: Drugs and chemicals should be used by generic name. If trademarks are mentioned, the manufacturer's name and city should be given. All funding sources supporting the work, either public or private, especially those from pharmaceutical companies, must be provided.

Genetic Sequence data: In papers reporting a novel DNA or amino sequence, verification that the data have been or will be submitted either to Gen-Bank or EMBL is required. Please provide this verification and the accession number in the covering letter.

REFERENCES

References must be in accordance with the Journal of Hepatology reference style. References are ordered as they appear in the text and citation numbers for references are placed between "brackets" (" []") in the text as well as in the reference list.

Authors should be listed surname first, followed by the initials of given names (e.g. Bolognesi M). If there are more than six authors, the names of the first six authors followed by et al. should appear.

Titles of all cited articles are required. Titles of articles cited in reference list should be in upright, not italic text; the first word of the title is capitalized, the title written exactly as it appears in the work cited, ending with a full stop. Journal titles are abbreviated according to common usage, followed by Journal years, semicolon (;) before volume and colon (:) before full page range (see examples below).

All articles in the list of references should be cited in the text and, conversely, all references cited in the text must be included in the list.

Personal communications and unpublished data should be cited directly in the text by the first Author, without being numbered. Please make sure you have the latest, updated version of your reference management software to make sure you have the correct reference format for Majmaah Journal of Health Science.

An example of how references should look within the text:

"HVPG was measured by hepatic vein catheterization using a balloon catheter according to a procedure described elsewhere [14, 15] and used as an index of portal hypertension [16]."

An example of how the reference list should look:

[14] Merkel C, Bolognesi M, Bellon S, Zuin R, Noventa F, Finucci G, et al. Prognostic usefulness of hepatic vein catheterization in patients with cirrhosis and esophageal varices. *Gastroenterology* 1992;102:973-979.

[15] Groszmann RJ, Wongcharatrawee S. The hepatic venous pressure gradient: anything worth doing should be done right. *Hepatology* 2004;39:280-282.

FIGURES

A maximum of 4 figures is allowed

(This can be modified if needed by Editorial board).

- Figures will be often, but not always, re-designed by graphic designers. By signing and transferring the Copyright Agreement to MJHS, the author gives permission to the graphic designers to alter the visual aspect of any figures, tables, or graphs. The scientific content of figures will not be altered. Please provide this information with your covering letter.
- All graphics submitted to Majmaah Journal of Health Science should be sent at their actual size, which is 100% of their print dimension and in portrait orientation.
- Two standard widths are used and figures should fit in one (8.5 x 23.5 cm) or two (17.5 x 23.5 cm) columns
- Figures should be supplied in the following preferred file formats: PDF (*.pdf), Power Point (*.ppt), Adobe Illustrator (*.ai, *.eps), Photoshop (*.psd) files in grayscales or in RGB color mode. It is highly recommended that figures not be sent in JPG (*.jpg) format.
- Photographs (scans, immunofluorescences, EM, and histology images) should be submitted as: 1. TIFF (*.tif) with a resolution of at least 300 pixels per inch, or
- Illustrator compatible EPS files with RGB color management (*.eps),
- Photoshop (*.psd) or PDF (*.pdf) files (grayscales or RGB) at the appropriate resolution, which is:
 1. 300 dpi for color figures
 2. 600 dpi for black and white figures
 3. 1200 dpi for line-art figures
- For all photomicrographs, where possible, a scale should appear on the photograph. Photographs of identifiable patients should be accompanied by written permission to publish from patient(s).
- Furthermore, panel lettering should be in Arial bold 14 pt, capitalized and no full stop (A, B) while lettering in figures (axes, conditions), should be in Arial 8 pt, lower case type with the first letter capitalized and no full stop. No type should be smaller than 6 pt.

TABLES

A maximum of 4 tables is allowed

(This can be modified if needed by Editorial board)

- Tables should be provided as Word files (*.doc) or Illustrator/InDesign (*.ai, *.eps, *.indd) compatible files. No TIFF and JPG files are acceptable for table submission.
- When submitting tables in Microsoft Word table function, no tab, space or colors should be used. Tables should contain a maximum of 10 columns.
- Tables submitted in landscape orientation will not be accepted. Tables should include a title, table legend, and if necessary footnotes.
- Include tables in the submitted manuscript as a separate section.

FIGURE LEGENDS

- Figure legends should be listed one after the other, as part of the text document, separate from the figure files.
- Please do not write a legend below each figure. Each figure legend should have a brief title that describes the entire figure without citing specific panels, followed by a description of each panel, and the symbols used.
- Enough information should be provided in the figure legend text to permit interpretation of figures without reference to the text; but should not contain any details of methods, or exceed 100 words.
- The abbreviated word for figure "Fig." should be typed and bolded, followed by the figure number and a period

(i.e. "Fig. 1."). Every figure legend should have a Title written in bold.

- If a figure contains multiple sections (i.e. A, B, C, D) the letter for these subsections should be in capital letters. Within the figure legend text the capital letters should be surrounded by parenthesis [i.e. (A)(B)(C)(D)].
- Figures should be numbered according to the order of citation.

Supplementary material: Supplementary material, not for review, is acceptable. Supplementary material can be submitted as (*.mov), (*.avi), (*.mpeg), or (*.gif) files. Please note that the size limit for these items is 10 MB per file.

ENGLISH

Authors may be asked to contact professionals regarding the correction of the English content of manuscripts either before or after acceptance. This expense will be the responsibility of the Authors.

C. REVIEW PROCESS

Authors should be aware that manuscripts will be screened upon submission. Only the manuscripts which fully comply with the submission requirements outlined and in which the level of English is of an acceptable standard will enter the peer review process.

First submission

Once successful submission of a manuscript has taken place, an acknowledgement will be sent by e-mail to the Corresponding Author on the manuscript. All subsequent correspondence will be with the designated Corresponding Author. The number of the manuscript should be used by the Authors in all communications with the Editorial Office. All the manuscripts will be reviewed by the Editors and, in some cases, by other expert reviewers. After review, the corresponding Author will be notified by letter of the decision taken by the Editor(s). This letter will be accompanied in most, but not all, cases by the comments of the reviewers. This letter will be sent via e-mail.

Resubmission of manuscripts

In some cases, Authors will be invited to submit a revised version of the manuscript for further review. This invitation does not imply, in any case, that the revised version will be accepted for publication. In general, revised manuscripts must be received in the Editorial Office within four months of the date of the first decision. Authors should submit the resubmitted manuscript with all changes underlined. The resubmitted manuscript should be accompanied by a cover letter stating that the manuscript has been revised according to the comments made by the Editor and the Reviewers. Figures and tables must be uploaded. Please ensure that a separate point by point response to the reviewers is included with the covering letter. Please do not send revised manuscripts to the Editorial Office via e-mail. Revised manuscripts should be mailed to site of Majmaah Journal of Health Sciences at mjhs@mu.edu.sa

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Proofs will be made available to the author(s) to be checked. It is the responsibility of the author(s) to make sure that the quality and accuracy of the manuscript, figures, and tables in the proofs is correct. Authors should return their proofs within 48 hours, by fax or e-mail if the corrections are minor, to expedite publication. Further changes or additions to the edited manuscript after these corrections cannot be accepted.

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This form should be printed out and the suitable statement chosen among the listed ones (A-G). It should then be signed by the corresponding author and faxed to the Editorial Office at +41 22 510 24 00. If this form is not received the paper will NOT be published.

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The manuscripts should include a complete and detailed description of what was done. This includes a description of the design, measurement and collection of data, the study objective and major hypotheses, type and source of subjects, inclusion and exclusion criteria and measures of outcome, number of subjects studied and why this number was chosen. Any deviation from the study protocol should be stated. The baseline characteristics of any compared groups should be described in detail and -if necessary -adjusted for in the analysis of the outcome.

For randomized clinical trials the following should also be clearly documented: treatments, sample size estimation, method of random allocation and measures taken for maintaining its concealment including blinding, numbers treated, followed-up, being withdrawn, dropping out, and having side effects (numbers and type). The statistical methods used should be relevant and clearly stated. Special or complex statistical methods should be explained and referenced.

Complex analyses should be performed with the assistance of a qualified statistician. Unqualified use of such analyses is strongly discouraged. The underlying assumptions of the statistical methods used should be tested to ensure that the assumptions are fulfilled.

For small data sets and if variable distributions are non-normal, distribution free (non-parametric) statistical methods should be used. The actual p values - whether significant or not - should always be presented (not NS). Confidence intervals convey more information than p values and should be presented whenever possible. Continuous variables can always be summarized using the median and range which are therefore preferred. Only in the infrequent case of a Normal distribution are the mean and standard deviation (SD) useful. Complex analyses (including Cox and logistic regression analysis) should be presented in sufficient detail: i.e. variable scoring, regression coefficients, standard errors and any constants. Odds-ratios or relative risks are not sufficient documentation of such analyses. The handling of any missing values in the data should be clearly specified. The number of statistical tests performed should be kept at a minimum to reduce spurious positive results. Explorative (hypothesis generating) analyses without confirmation using independent data are discouraged. Figures showing individual observations e.g. scatter plots are encouraged. Histograms may also be useful. Tables should indicate the number of observations on which each result is being based



