Associated Factors of Low Back Pain in a Sample of Patients Attending Hawler Teaching Hospital/Erbil City A Case Control Group

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Abstract

Background and objective: Low back pain (LBP) is an important clinical, social, economic, and public health problem affecting the population erratically and random. The aim of the study was to determine the factors associated with low back pain among patients attending physiotherapy department at Hawler teaching hospital in Erbil City.

Methods: the study was carried out from November 3rd, 2014 to November 3rd 2015.
The study involved of 100 cases diagnosed with low back pain in the physiotherapy depart- ment at Hawler teaching hospital subjects in control group are of the same age and gender of those in the experiment group , and 100 participants as a 100 as control group free from low back pain.

Result: Multiple logistic regression of risk factors of low back pain revealed that body mass index7.55 , non using lumbar support in sitting chair during work31.81, non-practice exercise 5.58, standing erect 34.836, sitting on a high backrest chair 27.986, sitting on a low backrest chair 65.167, drinking water per day 18.989, emotional stress 14.636 time have risky effect on low back affect low back pain respectively.

Conclusion: The study concluded that most of the participants in the study were employers and they perform different types of positions such as bending, squatting and sitting during work time, there were statistical significant association between body mass index, lifting heavy objects, driving and emotional stress with development of low back pain.

Keywords: Associated risk factors, low back pain

1. Introduction

As part of the Global Burden of Disease study(GBD) 2010, the expert group showed that low back pain is among the top ten high burden diseases and injuries, with an average number DALYs (disability –adjusted life years) higher than HIV, road injuries, tuberculosis lung cancer, chronic obstructive pulmonary disease and preterm birth complications [1] . According to the Horvath *et al* 2010 European review article the prevalence of back pain ranged between 14% and 42% whereas lifetime prevalence was between 51% and 84% and higher prevalence are found between the ages of 50 and 64, the socioeconomic impact of back problem is enormous. The causes of low back pain may be muscle strain or trigger point, instability due to weak postural muscle, hypo mobile spinal facet joints, or degeneration or herniation of spinal discs. [2] The spine is designed to carry weight and distributed weight equally. With aging the constituents of the spine change and diminished ability to function properly. The ability to absorb shock and cushioning movements of the disc reduce. Over-weight persons stressing and straining their vertebrae and disc even more. As the spine has to work harder to carry the extra weight it hastens the degenerative processes. The harder they work the faster they may wear out degenerate [3] . Psychological factors are known

to play a strong significant role in the neurological pathway. Serotonin and norepinephrine moderated the response to painful physical stimuli in the brain which also affect mood [4] . According to US National center for Health Statistics reports, 14% of new patients that went to a hospital for treatment were patients with low back pain. This represents 13 million people. About 3% of all patients discharged from hospitals have symptomatic low back pain. The expense of treating low back pain is higher than $100 billion each year [5] . Foremost aim of the current study was to determine most common risk factors associated with low back pain among patients attending physiotherapy department at Hawler teaching hospital in Erbil city .

2. Methods

A case study was conducted in the physiotherapy department at Hawler teaching hospital/ Erbil city, The sample of the study included the experimental group consist of (100) patients with low back pain who attending physiotherapy department and control group consist of (100) persons free of low back pain. The inclusion criteria of the study include any adult males of females diagnosed with low back pain who agree to participate in the present study and the criteria of control group are healthy adult that match the experimental group in age and gender, the researchers used a questionnaire include participant's sociodemographic characteristics, patients health history and nutritional status, for emotional stress status PERCEVED STRESS SCALE (Pss-10)was used for measuring anthropometric include body weight (kg) was measured in ordinary indoor and without shoes using the physiotherapy department weighing balance scale and height (cm) was measured on vertical scale with a rigid – adjustable arm- piece with participants standing erect without shoes. According to the world health organization, BMI categorize as: under weigh < 18.5 kg/m^2, normal weight 18.5 – 24.9 kg/m^2, overweight 25.0-29.9kg/m^2, moderate obesity (class I) =30.0-34.9kg/m^2, sever obesity (class II)= 35-39.9 kg /m2 and very sever obesity morbid (class III) less or equal 40kg/m^2 [6] For measuring waist-hip ratio was measured in a standing position as the minimum reading observed between the costal margin and the pelvic brim, at the level of the umbilicus (horizontal plane, midway between inferior margin of the ribs and superior border of the ilia crest) waist hip ratio which obtained by dividing waist circumference(cm) by hip circumference (cm) and its classification include(male: excellence< 0.85, good 0.85-0.89, average 0.90-0.95 at risk > 0.95)(female: excellence<0.75,good 0.75- 0.79, average 0.80-0.86, at risk > 0.86) for both male and female the two latter ratio are considered unacceptable ration [7] , with weighing scale characterize by good working condition, zero value and same weighing scale for all study participants. Ethical approval was obtained from ethical review committee of college of nursing/Hawler medical university and oral consent obtained from each study participants, finally the researchers used Chris white and grace Edgar office for national statistics (2010) for job classification which include office, skilled manual, non- skilled manual, house wife, retired and student)

3. Statistical analysis

Data were coded and analyzed by using Microsoft office excel 2010, and a statistical package of social science (SPSS version 21). chi- square test of association was used to compare proportion. Fisher's exact was used when more than 20% of cells of the table have expected count less than 5. Logistic regression was used to identify confounding factors and measure the independent effects of each variable. Each factor that showed a statistically significant difference between cases and controls at any time period was incorporated in to the logistic regression model. A P value of <0.05 was considered as statistically significant and < 0.01 as highly significant. The whole statistical procedure was tested on a probability of P value that was considered as the following: less and equal 0.001 is very high significant, equal or less 0.01 is high significant, equal or less 0.05 is significant and finally equal or more 0.05 non-significant and Odd ratio value was considered as: OR= 1 it means risk does not affect odds of low back pain, OR >1 it means risk associated with higher odds of low back pain and OR<1 it means risk associated with lower odds of low back pain [8] .

4. Results

The BMI of More than half 59% of experimental group was about 30-39.9 which means that they were at obese level while the BMI of the majority of the participants in the control group 78 % was 25-29.9 it means that they were at overweight level . There was a significant relationship between BMI and LBP (p< 0.001)(table 1). This table also reveals that among 50 men in each group of experimental and control group the waist- hip ratio was more than 0.95 of 52% and for most (94%) of control group with statistical significant relationship between WHR and LBP(P<0.001)regarding waist hip ratio of (50 females) in each group the highest percentage is (92% and 90%) of experimental group and control groups respectively the WHR was more than 0.86 with no significant relationship between WHR female and LBP (P=0.727). The majority percentage (44% & 58%) of experiment group and control group respectively were employer and (30% , 46%) have office type job, about half (44%) of experiment of were group lifting heavy object during work, regarding using lumbar support in sitting during daily work and activity (96%)of experimental group and(43%) not using lumbar support. There were very high significant relationship between lifting heavy object, using lumbar support with low back pain (p<0.001) (table 2).depending on a chart of postures which clarified the correct and incorrect posture performed by the study of participants during daily activities (table 3) shows that the majority of experimental group had incorrect posture in standing erect 86%, sitting on high back rest chair87%, sitting on low back rest chair(92%) while the highest percentage (91%) used correct sleeping posture and there were very high significant relationship between all the mentioned posture and the low back pain (p<0.001) except in sleeping and sleeping posture. In (table 4) The majority of the study participants in both case and control groups (89%, 87%)eating starch content foods, (76%, 54%)eat fruits, (92%,92%) eat dairy products1-2 times per day, most of the experimental group (57%)eat meat and poultry product,(98%) eat fatty products, (61%) sweet less than one time per day; while, most of the control group (52%)(59%) eats dairy products and sweet 1-2 times per day the present table shows that the majority (78%) of

control group drinks 8 and more glasses of water per day while the majority percentage (36%)(37%) of case group drinks water fewer than 3 glasses per day and 3-4 glasses per day respectively, there was very high significant relationship between eating fruits and sweet and drinking water with LBP (p<0.001). The majority percentage (81%) of cases have high level of emotional stress in compare to control group only where (1%) haves stress as presented in (table 5) and this table shows that there was very high statistical significant relationship between emotional stress and LBP (P<0.001) (Table 5) shows the result of logistic regression to identify times of risks for the study of variable the of sitting on a low back rest chair they have 65.16 time risk of low back pain.

Table 1. Anthropometric characteristics of 200 study participants (case and control) and their relationship with low back pain.

Factors		Case (100)		Control (100)		P-value Chi-square
		F	%	F	%	
Body Mass Index	Underweight = <18.5	1	1	0	0	< 0.001 VHS
	Normal weight = 18.5–24.9	6	6	6	6	
	Overweight = 25–29.9	34	34	78	78	
	Obesity = 30-39.9	59	59	16	16	
	Extreme Obesity = 40 or greater	0	0	0	0	
Waist to Hip Ratio Male	Excellent <0.85	4	8	1	2	< 0.001 VHS
	Good 0.85-0.89	6	12	1	2	
	Average 0.90-0.95	14	28	1	2	
	At Risk >0.95	26	52	47	94	
Waist to Hip Ratio Female	Excellent <0.75	0	0	0	0	0.727 NS
	Good 0.75-0.79	0	0	0	0	
	Average 0.80-0.86	4	8	5	10	
	At Risk >0.86	46	92	45	90	

Table 2. Distribution of experimental and control by occupation and relationship between LBP and occupation.

Participant's occupation		Case (100)		Control (100)		P-value Chi-square
		F	%	F	%	
Occupation	Employer	44	44	58	58	0.036** S
	Non-employer	24	24	16	16	
	Student	1	1	5	5	
	House wife	25	25	13	13	
	Retired	6	6	8	8	
Type of job	Office	30	30	46	46	0.008** HS
	Skilled manual	24	24	24	24	
	Non-Skilled manual	14	14	4	4	
	Household	25	25	13	13	
	Retired	6	6	8	8	
	Student	1	1	5	5	
Years of working for	1-14	38	55.9	35	47.3	

(Employee and Non-employee)	15-28	24	35.3	35	47.3	0.313** NS
	29-42	6	8.8	4	5.4	
Posture taking during working time.	Sitting	47	47	50	50	0.303* NS
	Bending	10	10	4	4	
	Squatting	3	3	1	1	
	Standing	40	40	45	45	
Using lumbar support in sitting during work.	Yes	44	44	19	19	<0.001** VHS
	No	56	56	81	81	
Using lumbar support in sitting during work.	Yes	4	4	57	57	<0.001** VHS
	No	96	96	43	43	

* Fisher's Exact Test **Chi-Square Test

Table 3. Relationship between Posture and low back pain among 200 study participants (case and control).

Postures		**Case (100)**		**Control (100)**		**P value** Chi-Square
		F	**%**	**F**	**%**	
Doing a work in front of a table at hip level in standing	Correct	62	62	90	90	<0.001 VHS
	Incorrect	38	38	10	10	
Standing erect	Correct	14	14	85	85	<0.001 VHS
	Incorrect	86	86	15	15	
Sitting on a high back rest chair	Correct	13	13	80	80	<0.001 VHS
	Incorrect	87	87	20	20	
Sitting on a low back rest chair	Correct	8	8.0	85	85	<0.001 VHS
	Incorrect	92	92	15	15	
Driving	Correct	7	19.4	47	90.4	<0.001 VHS
	Incorrect	29	80.6	5	9.6	
Sleeping	Correct	91	91	95	95	0.268 NS
	Incorrect	9	9	5	5	
Posture which preferring during sleeping	Supine lying	16	16	8	8	0.074 NS
	Prone lying	11	11	6	6	
	Side lying	73	73	86	86	
Type of mattress uses during sleeping	Firm	71	71	26	26	<0.001 VHS
	Soft	18	18	67	67	
	Wooden	11	11	7	7	

Table 4. Relationship between nutritional status and low back pain among 200 study participants (Case and Control).

Nutritional Status	per day	Case (100)		Control (100)		P value
		F	%	F	%	
Starch (bread, rice cereal, pasta, potato and noodles).	Less tha1	7	7	1	1	0.016* S
	1-2	89	89	87	87	
	3 and more	4	4	12	12	
Fruits.	Less than 1	14	14	2	2	<0.001** VHS
	1-2	76	76	54	54	
	3 and more	10	10	44	44	
Vegetables.	Less than1	7	7	8	8	1.000* NS
	1-2	92	92	92	92	
	3 and more	1	1	0	0	
Dairy (milk, yogurt).	Less than1	45	45	34	34	0.148* NS
	1-2	55	55	65	65	
	3 and more	0	0	1	1	
Meat, fish, poultry, eggs and cheese.	Less than1	57	57	48	48	0.062* NS
	1-2	40	40	52	52	
	3 and more	3	3	0	0	
Fat (butter, cream, margarine, cheese, Mayonnaise).	Less than1	98	98	97	97	1.000* NS
	1-2	2	2	3	3	
	3 and more	0	0	0	0	
Sweets (candy, cake, juice).	Less than1	61	61	37	37	<0.001** VHS
	1-2	30	30	59	59	
	3 and more	9	9	4	4	
No. of glasses of water drinking per day	Fewer than 3 glasses	0	0	36	36	<0.001** VHS
	3-4 glasses	3	3	37	37	
	5-6 glasses	0	0	16	16	
	7 glasses	19	19	5	5	
	8 and more	78	78	6	6	

* Fisher's Exact Test **Chi-Square Test

Table 5. Relationship between level of emotional stress and low back pain among 200 study participants (experimental and Control).

Emotional Stress	experimental (100)		Control (100)		P-value Chi-Square
	No.	%	No.	%	
Low stress	0	0	26	26	< 0.001 VHS
Moderate stress	19	19	73	73	
High stress	81	81	1	1	
Total	100	100	100	100	

Table 6. Logistic regressions showing association between low back pain and some variables.

No	Variables	P value	Odd ratio OR	95% C.I for OR	
				Lower	Upper
1.	**BMI (Obesity 30 - 39.9)**	< 0.001**	7.55	3.878	14.717
2.	**Occupation**				
	Employer (reference)	0.036**			
	Non-employer		1.71	0.82	3.59
	Student		0.25	0.03	2.25
	House wife		2.44	1.12	5.29
	Retired		0.95	0.31	2.94
3.	**Type of job**				
	Office (reference)	0.08**			
	Skilled manual		1.53	0.74	3.18
	Non-Skilled manual		5.37	1.61	17.86
	Household		2.95	1.31	6.65
	Retired		1.15	0.36	3.65
	Student		0.31	0.03	2.76
4.	**Lifting heavy object during work time**				
	No (reference	<0.001**			
	Yes		3.35	1.77	6.33
	Using lumbar support in sitting facility (chair) during work				
	Yes (reference)	<0.001**			
	No		31.81	10.85	93.28
6.	**Practicing exercise**				
	Yes (reference)	<0.001**			
	No		0.51	0.11	0.24
7.	**Standing erect**	<0.001**	34.81	15.836	76.517
8.	**Sitting on a high back rest chair**	<0.001**	26.76	12.501	57.321
9.	**Sitting on a low back rest chair**	<0.001**	65.16	26.302	161.462
10.	**Driving**	<0.001**	38.94	11.298	134.228
11.	**Less than 3 glasses of water drinking /day**	<0.001**	18.98	5.614	64.228
12.	**Emotional Stress**				

* Fisher's Exact Test **Chi-Square Test

5. Discussion

Obesity is recognized as a major public health problem in industrialized countries and it is associated with various musculoskeletal disorders, including impairment of the spine, low back pain and osteoarthritis [9]

The results of the present study indicate that more than half percentage of the experimental group were obese, also its found that Theresa significant relationship between BMI and low back pain as there is 7.55 time risk of low back pain [10] . A study done in marka medical center Amman/ Jordan for 513 patients complaining of low back pain the BMI of(66%)less or equal 30kg/m2 and there was a significant relationship between mean weight of cases and low back pain> Another study revealed that BMI exceeding 24kg/m2 or waist to hip ratio exceeding 0.85 might cause over BMI has been associated with LBP in men , increase in BMI may increase the iner-discal and intra- discal pressure the vertebral disc of lumber vertebra, especially L4&L5 inter-vertebra disc [11]

Occupational risk factors commonly thought to be associated with LBP include heavy physical work, a static work posture, repetitive bending and twisting, lifting and whole body vibration [12]

Most percentage in the present study of the occupation in both groups occupied by governmental and nongovernmental employer with 25% of experimental group and 13% of control group there were house wives. Regarding types of job for employer most of them had office jobs, more than half percentage and near of half percentage of case and control groups respectively have about 1-14 years experience, most of the participants in experimental group were using sitting position with no lumbar support according to the finding of the present study there were very high significant association between using lumber support and lifting heavy object with low back pain.

The result also reveals that non skill manual job, lifting heavy object, non- using lumber support during work time have (5.37, 3.35 and 31.81) time more risk of low back pain respectively. The result of the present study comes along with a study Which showed that the majority percentage of the patients presenting with LBP were employed, the results demonstrate that LBP was common up to 36.22% in those patients with sedentary life style as compared to 17.30% framers, 12.97% housewives, 18.38% laborers and 4.32% students, Its observed that LBP lesions in subjects whose work required limited physical stress in the lumbosacral spine that particularly those whose sedentary lifestyle demanded variable postures and prolonged sitting are more exposed to low back pain [13] a study conducted in chulalongkorn university among 397 office worker there were office job 59.5% that didn't use chair having lumber support there was significant relationship with LBP and the result shows that those who didn't use lumber support have 1.69 time risk for low back pain mane than those use lumber support (p= 0.035) [14]

In the present study the result shows that there was a very high significant relationship between different types of postures performed by the study participants and low back pain in compare to the control group participants

In comparing the result of experimental group with control group regarding nutritional status its shown that there were a very high statistical significant relationship between these variables (eating fruit, consuming sweet and drinking water) and low back pain, regarding drinking water, the result of the present study shows that the participants who drink 4-5

glasses or less of water per day have 18.98 times risk of low back pain more than those drinking 8 glasses and more of water per day. A cross-sectional exploratory study showed in univariate analysis only a few dietary variables were associated with spinal pain. In females, a reduced risk of back pain was associated with high intakes of some nutritional elements (meat, sodium, copper, carotene and vitamin B6) and with low intakes of vitamin E, poly saturated fat and omega 6 fatty acids). In males, a reduced risk of back pain was associated with high intakes of (fruits) and low intakes of some nutritional elements (iron and nicotinic acid).proper nutrition is important because the bone and the connective tissue in tendons and ligaments are metabolically active. Without proper nutrients bone can lose mass or become brittle, tendons and ligaments can lose flexibility, and cartilage, which composes the intervertebral disc. It can degenerate or lose its structural integrity if proper vitamins and minerals aren't available in sufficient concentrations at proper times. Vitamin B6 aids in production of gamma- aminobutyric acid (GABA) which inhibits neural excitation. This acts as a natural painkiller and tranquilizer [15]

Regarding emotional stress the result of the present study shows that majority (81%) of cases have a high level of stress in compare to only 1% among control group. Also it shows that there is a statistically significant association between emotional stress and low back pain in compare to control group ($p< 0.001$) and the result of logistic regression shows that the participants with emotional stress have 14.636 time risk of low back pain. A study conducted among 100 adult patients (68 males and 32 females) showed that respondents who practice higher levels of stress in their work and had poor job satisfaction established significant association with complaints of low back pain ($p< 0.005$) [16]

The association between psychological work characteristics and musculoskeletal disorder.

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الخلاصة

الخلفية والهدف: آلام أسفل الظهر هو مشكلة سريرية, اجتماعية واقتصادية هامة وهو بالتأكيد مشكلة صحية عامة تؤثر على الانسان بطريقة متقطعة وبشكل عشوائي. الهدف من هذه الدراسة هو تحديد العوامل المرتبطة بآلام أسفل الظهر بين المرضى الذين يراجعون قسم العلاج الطبيعي في مستشفى هولير التعليمي في مدينة أربيل بهدف العلاج.

الطريقة والمنهاج: أجريت الدراسة واستمرت لعام كامل بدءا من ال 3 من شهر تشرين الثاني 2014 إلى ال 3 من شهر تشرين الثاني من 2015. وشملت الدراسة 100 حالة تم تشخيصها بآلام أسفل الظهر في قسم العلاج الطبيعي في مستشفى هولير التعليمي مع عدد مماثل من الاشخاص الاصحاء لا يعانون من نفس المشكلة كمجموعة ضابطة و مراعاة التطابق في العمر والجنس لكلا المجموعتين.

النتائج: اظهرت نتائج التحليل الاحصائي للانحدار المنطقي المتعدد للعوامل المرتبطة بالام اسفل الظهر ان مؤشر كتلة الجسم7.55, عدم استخدام دعم المنطقة القطنية في حالة الجلوس31.81, عدم ممارسة الرياضة 5.58, الوقوف بشكل منتصب 34.836, الجلوس على الكرسي بمسند عالي للظهر 27.986, والجلوس على الكرسي بمسند منخفض للظهر 65.167, عدم شرب كمية كافية من الماء يوميا 18.989, التوتر النفسي والعاطفي 14.636 مرة لها تأثير الخطورة على الاصابة بالام اسفل الظهر بشكل متوالي لكل عامل.

الاستنتاجات: توصلت الدراسة الى ان معظم المشاركين في البحث هم من الموظفين و اصحاب الاعمال و هم يؤدون اوضاع مختلفة اثناء العمل مثل: الانحناء, جلوس القرفصاء والجلوس اثناء العمل لفترات طويلة. واكد ان هناك ارتباط ذات دلالات احصائية عالية بين مؤشر كتلة الجسم, رفع الاشياء الثقيلة, قيادة السيارات والتوترات العاطفية والنفسية و بين تطور حالات الام اسفل الظهر.

الكلمات المفتاحية: معامل ارتباط الخطورة ،آلام اسفل الظهر.