

Risk Factor of Upper Back Pain in General Population of Lahore: A Case Control Study

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Abstract

Background

Upper or mid back pain is defined as the pain in thoracic and thoracolumbar region due to any infection, trauma, inflammation, poor posture or due to organ. It is usually independent of age but many studied showed that it is common among women of age group between 18 to 75 years

Objective

To find out the risk factors of upper back pain in general population of Lahore.

Method

Case control study of 190 participants that evenly divided (95 cases and 95 control group) into case and control group. Self-made questionnaire were used for the collection of data from General population with and without back pain according to inclusion criteria. Convenient sampling method was used.

Result

This study and previous studies showed the high percentage of upper back pain associated with risk factors. P value <0.05

Conclusion

Risk factors of upper thoracic pain were presence of kyphosis, prolong mobile usage, presence of poor posture, immobility, poor muscle strength, and history of trauma, spinal stenosis, presence of inflammation, degenerative disease, and Ankylosing Spondylitis.

Introduction

Overview

Upper or mid back pain is defined as the pain in thoracic and thoracolumbar region due to any infection, trauma, inflammation, poor posture or due to pathology of underlying or adjacent viscera. It is usually not age related but many study showed that it is common in women age group 18 years to 75 years [1,2]. The major symptoms include stiffness, pain, and fatigue. Back pain disturbs the activity of daily living like clothing, sitting, standing and other many functional activity.

The prevalence of mid back pain is 62% to 81% and 68% to 70% in women and men respectively. Another study showed that the 85% men and 71% women affected by mid back pain with age 65 years. Another research showed that 15-20% had LBP in single year. LBP affected all ages [3-5] and back pain showed increase prevalence in pregnancy.

The major cause of LBP and upper back pain is mobile and computer use for a long time. The risk of back pain increases with the poor posture and poor health status. The vertebral body height decrease with the age due to decrease in BMD. Degenerative diseases and cancer or trauma are major causes of back pain. Back pain also common in pregnancy. Patients

with age of 30 or above experienced back pain due to many different causes. Common causes are impairment and disability in lower limbs, disc prolapse, degeneration of IVD, loss of viable cell and abnormal matrix. Other major causes include poor posture, prolonged sitting, stenosis, kyphotic posture, osteoporosis, calcification of disc. Back pain is a common cause of referral to the hospital that increasing day by day [6,7]. The enlargement (Bertolotti's syndrome) of transverse process also one of causes of back ache. Many study show that if we perform regular exercise the risk of back pain will be reduced. Patient and client education is very important to improve the posture during work [8-10]. The smoking and tobacco use also has association with back ache [2,4,5].

Objective

To find out the risk factors of upper back pain in general population of Lahore

Rationale

This study will evaluate the risk factors that lead to back pain. So this study will help to enhance awareness of general population about the risk factors that lead to back pain in future and will also help in controlling pain in already affected patients. Back pain impairs the quality of life and activity of daily livings including functional and mental status.

Operational Definition

Self-made questionnaire

Literature Review

Cross-sectional study conducted by B. Ettinger et al in 1993 they took 610 women age between 25 years to 91 years and the research showed that the height of spine decreased after the age of 25. The spine height loss and the change in shape of curvatures are cause of low back pain. They concluded that the bone mineral density reduced after 25 years age and cause of loss of spine height but not linked to chronic pain and poor health of older women [8].

A longitudinal study conducted in 1994 that found the relationship between obesity and back pain. They want to find out the back pain is reduced if weight is reduced. They read

many article and concluded that there is no proof between the weight and obesity [11].

A cross sectional analytic study conducted by AC Schwarzer et al in in which they find out the relationship between disc prolapse and back ache they took 92 patient with chronic back pain with no history of any surgery in the investigation they done CT scan and most common region of disc prolapse is lumbar region. They concluded that disc prolapse can cause the back pain [12].

746 people which have nonspecific pain data is taken by (marital status, age, physical activity and smoking and life style) they fine out the association between extent and sub definition of back pain. A cross sectional study conducted by C Leboeuf-Yde et al in 1997 concluded that the linked with back pain and above describe factor [13].

Lyle J. Micheli et al in 1995 conducted the retrospective randomized case control study.

In which 100 participants with back pain some diagnosed as spondylosis linked back pain some had disc related pain some due to poor posture and some had kyphosis and few had musculo-tendinous related pain. It compared general population with athlete and concluded that correct diagnose helped in better treatment [14].

Methodology

Study Design: Case control study

Setting: General Population of Lahore

Study Duration: Study was completed in 6 months.

Saple Size:

$$\text{Sample size} = \frac{r+1 (p^*)(1-p^*)(Z_{\beta} + Z_{\alpha/2})^2}{(P_1 - P_2)^2}$$

According to this formula the minimum sample size calculated was 190 i.e., 95 in each group .This sample had been calculated by considering following parameters Where

$Z_{1-\alpha/2}$ (Z score for level of significance in two sided test) = 1.96

$Z_{1-\beta}$ (Z score for power of the test) = 1.28 (90% power)

Estimated proportion derived from literature is[15]

Proportion in Cases (P_1) = 65%

Proportion in Controls (P_2) = 50%

Sampling Technique: Convenient sampling

Eligibility Criteria: Case

Inclusion Criteria: Both male and female participants, aged 18-50, with upper back pain control both male and female participants, aged 18-50, without upper back pain.

Exclusion Criteria:

Patients with systemic disease eg Renal, Liver or Cardiac issues.

History of any Malignancy

Data collection tool: A self-made questionnaire

Data collection procedure: General population with pain and without pain according to inclusion criteria included in this study. Convenient sampling was used. The identity of the researcher kept anonymous. All measures were collected during a single session. After taking informed consent participants were requested to fill questionnaire. Self-made questionnaire was used. The duration of study was 6 month after approval from the ethical committee.

Statistical procedure: The data was analyzed using SPSS. Variables i.e. demographic and risk factors were calculated. Odd ratio used for result.

P value was significant <0.05

Result

Table 1 Socio demographic Profile (Qualitative Variables)

Variable		Upper Back Pain		Total
		Yes (Cases)	No (Controls)	
Gender	Male	55(57.9%)	38(40%)	93(48.9%)
	Female	40(42.1%)	57(60%)	97(51.1%)
	Total	95	95	190

Table 2 Socio demographic Profile (Quantitative Variable)

Variable	Upper Back Pain	
	Yes (Cases)	No (Controls)
Age	45.49±13.65	33.34±10.11
Pain Score	1.96±0.2	1.03±0.18

A total of 190 participants took part in the study. Out of total 95 had upper back pain (cases) and 95 were without pain (controls). Among cases 55(57.9%) were males and 40(42.1%) were females whereas among controls 38(40%) were males and 57(60%) were females. The mean age of participants in case group was 45.49±13.65 and in control groups was 33.34±10.11

Table 3 Risk factors of Upper Back Pain

Variable		Upper Back Pain		Total	OR(95%CI)	p-value
		Yes (Cases)	No (Controls)			
Presence of Kyphosis	Yes	51(53.7%)	23(24.2%)	74(38.9%)	3.63(1.95-6.74)	<0.001
	No	44(46.3%)	72(75.8%)	116(61.1%)		
Total		95(100%)	95(100%)	190(100%)		
Mobile Usage	Yes	88(92.6%)	64(67.4%)	152(80%)	6.72(1.46-30.92)	<0.001
	No	7(7.4%)	31(32.6%)	38(20%)		
Total		95(100%)	95(100%)	190(100%)		
Computer Usage	Yes	46(48.4%)	70(73.7%)	116(61.1%)	0.34(0.18-0.62)	<0.001
	No	49(51.6%)	25(26.3%)	74(38.9%)		
Total		95(100%)	95(100%)	190(100%)		

Presence of poor posture	Yes	91(95.8%)	83(87.4%)	174(91.6%)	3.29(1.02-10.6)	<0.001
	No	4(4.2%)	12(12.6%)	16(8.4%)		
Total		95(100%)	95(100%)	190(100%)		
Immobility	Yes	57(60%)	28(29.5%)	85(44.7%)	3.59(1.96-6.56)	<0.001
	No	38(40%)	67(70.5%)	105(55.3%)		
Total		95(100%)	95(100%)	190(100%)		
Poor Muscle Strength	Yes	81(85.3%)	59(62.1%)	140(73.7%)	3.53(1.75-7.13)	<0.001
	No	14(14.7%)	36(37.9%)	50(26.3%)		
Total		95(100%)	95(100%)	190(100%)		
History of Trauma	Yes	51(53.7%)	11(11.6%)	62(32.6%)	8.85(4.19-18.68)	<0.001
	No	44(46.3%)	84(88.4%)	128(67.4%)		
Total		95(100%)	95(100%)	190(100%)		
Spinal Stenosis	Yes	21(22.1%)	2(2.1%)	23(12.1%)	13.2(3-58.1)	<0.001
	No	74(77.9%)	93(97.9%)	167(87.9%)		
Total		95(100%)	95(100%)	190(100%)		
Presence of inflammation	Yes	30(31.6%)	5(5.3%)	35(18.4%)	8.31(3.06-22.56)	<0.001
	No	65(68.4%)	90(94.7%)	155(81.6%)		
Total		95(100%)	95(100%)	190(100%)		
Degenerative Disease	Yes	58(61.1%)	16(16.8%)	74(38.9%)	7.74(3.93-15.24)	<0.001
	No	37(38.9%)	79(83.2%)	116(61.1%)		
Total		95(100%)	95(100%)	190(100%)		
Ankylosing Spondylitis		12(12.6%)	2(2.1%)	14(7.4%)	6.72(1.46-30.92)	0.01
		83(87.4%)	93(97.9%)	176(92.6%)		
Total		95(100%)	95(100%)	190(100%)		
p-value significant at or less than 0.05						

Out of total 74(38.9%) had khyphosis i.e., 51(53.7%) cases and 23(24.2%) controls. The odds ratio 3.63(1.95-6.74) and p value (<0.001) show that presence of khyphosis is the risk factor of upper back pain. Out of total 152(80%) were mobile user i.e., 88(92.6%) cases and 64(67.4%) controls. The odds ratio 6.72(1.46-30.92) and p value (<0.001) show that mobile usage is the risk factor of upper back pain. Out of total 116(61.1%) had computer usage i.e., 46(48.4%) cases and 70(73.7%) controls. The odds ratio 0.34(0.18-0.62) and p value (<0.001) show that computer usage is the risk factor of upper back pain. Out of total 174(91.6%) had presence of poor

posture i.e., 91(95.8%) cases and 83(87.4%) controls. The odds ratio 3.29(1.02-10.6) and p value (<0.001) show that presence of poor posture is the risk factor of upper back pain. Out of total 85(44.7%) had immobility i.e., 57(60%) cases and 28(29.5%) controls. The odds ratio 3.59(1.96-6.56) and p value (<0.001) show that immobility is the risk factor of upper back pain. Out of total 140(73.7%) had poor muscle strength i.e., 81(85.3%) cases and 59(62.1%) controls. The odds ratio 3.53(1.75-7.13) and p value (<0.001) show that poor muscle strength is the risk factor of upper back pain. Out of total 62(32.6%) had history of trauma i.e., 51(53.7%) cases and

11(11.6%) controls. The odds ratio 8.85(4.19-18.68) and p value (<0.001) show that history of trauma is the risk factor of upper back pain. Out of total 23(12.1%) had spinal stenosis i.e., 21(22.1%) cases and 2(2.1%) controls. The odds ratio 13.2(3-58.1) and p value (<0.001) show that spinal stenosis is the risk factor of upper back pain. Out of total 35(18.4%) had presence of inflammation i.e., 30(31.6%) cases and 5(5.3%) controls. The odds ratio 8.31(3.06-22.56) and p value (<0.001) show that presence of inflammation is the risk factor of upper back pain. Out of total 74(38.9%) had degenerative disease i.e., 58(61.1%) cases and 16(16.8%) controls. The odds ratio 7.74(3.93-15.24) and p value (<0.001) showed that degenerative disease was the risk factor of upper back pain. Out of total 14(7.4%) had ankylosing spondylitis i.e., 12(12.6%) cases and 2(2.1%) controls. The odds ratio 6.72(1.46-30.92) and p value (.010) showed that ankylosing spondylitis was the risk factor of upper back pain.

Discussion

This study was conducted to know the risk factors of upper back pain among the general population of Lahore. Result showed high percentage of risk factors associated with upper back pain. The self-made questionnaire used for this study included kyphosis, poor muscle strength, trauma and other many variables.

This study showed kyphosis had a high prevalence of back pain. 53.7% cases of back pain having kyphosis whereas only 24.2% control had back pain. Same result revealed in another study that kyphotic patients showed high incident of back pain [16].

Our study showed high prevalence about 95% cases which had poor posture whereas only 4% with poor posture had no pain. A previous study showed high incident of pain in poor posture. Our study showed that the immobile patients had high percentage of upper back ache 60%. Previous study supported the result that the prolonged sitting mostly lead to upper back ache [17].

In our study computer usage 48.4% with Upper back pain but 51.6% had no pain. A study published in European Journal of Health showed high prevalence of backache in computer users. Our study showed 92.6% causes of upper backache previous study supported the result [18,19]. History of trauma causing upper back pain in 53.7% of patients 46.3% history of trauma reported no upper back pain. Previous studies also had showed upper back pain related to trauma [20].

Poor Muscle strength is also an indicator of chronic back pain as was shown in the study. In this study poor muscle strength was an indicator of chronic back pain as was seen in 85.3% of patients with back pain [21].

This study showed spinal stenosis lead to upper back pain elderly 22.1%. This study showed that in 61.1% patient cause of pain was degenerative changes and Ankylosing Spondylitis. Previous study also showed high prevalence of back ache in these cases [22].

Improving muscle strength and correcting poor posture (ergonomic use) were relieving factors for upper back pain.

Conclusion

Risk factors of upper thoracic pain were presence of kyphosis, mobile usage, presence of poor posture, immobility, poor muscle strength, and history of trauma, spinal stenosis, presence of inflammation, degenerative disease, and Ankylosing Spondylitis.

Limitation

Sample size was small.

Tools were not defined clearly moreover data collected on the basis of observation mainly.

Participant's hesitation in providing data.

Recommendation

Use better Tools with better validity.

Well defined questionnaire should be used.

Awareness of population about ergonomic or posture training for cure or avoiding backache.

Sample size should be large.

Declaration

The ethical committee and concerned department approved to conduct the study. There was no conflict of interest. No grant was taken for this study. Only those peoples were included in the study who signs the written consent. All the personal information of participant was kept hidden.

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