

SOCIO-DEMOGRAPHIC, OCCUPATIONAL AND BEHAVIOURAL RISK FACTORS THAT ATTRIBUTE TO LUMBAR DISC HERNIATION AND DEGENERATION: A CASE CONTROL STUDY IN A SELECTED SRI LANKAN POPULATION

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Introduction

Lower back pain (LBP) is a common musculoskeletal disorder that affects most people at some point in their lives. This has been considered as a major health problem worldwide due to its high impact on socio-economic burden of a country. Several studies have revealed that 60 - 80 % of the general population suffer from LBP and it is also recorded as the key cause for 9 – 19.5 % of sick leaves among employers [1, 2]. Among several causes for LBP, lumbar disc herniation and degeneration (LDHD) is rated as the main determinant. Lumbar disc herniation (LDH) is the localized displacement of intervertebral disc beyond the limits of intervertebral space. Although several studies have been carried out to determine the exact cause of LDHD, none of them have given promising findings. Though it has been suggested that individual, social, occupational and behavioural factors could contribute to LBP associated with LDHD [1]; age, sex, heavy occupation, mechanical loading, smoking and strenuous sporting activities have been studied extensively [1, 3].

Studies have stated that degeneration usually commence at a very early stage of life, where mild changes are seen in the first decade of life and more significant changes in second decade onwards. However, some studies have emphasized that LBP and LDHD are common in the fourth to fifth decade of life [2]. Although the prevalence of LBP increases with age, studies have shown that there is no linear relationship between age and LBP, thus suggesting the association of multiple factors. It is documented that males are more prone to the development of LDHD compared to females [4]. Occupational factors, including severe physical loading is a strong determinant of LBP. Furthermore, several studies have found strong association with smoking and LDHD. However, there are no reported studies regarding LBP associated LDHD in the Sri Lankan context. Hence this present study was carried out to identify the relationship of selected socio-demographic, behavioural and occupational factors with LDHD in Sri Lankan subjects.

Materials and Methods

Study design and setting

A case-control study was carried out at the Central hospital and the Faculty of Medical Sciences, University of Sri Jayewardenepura after obtaining written consent from all the participants. The study was approved by the Ethics Review Committee of Faculty of Medical Sciences, University of Sri Jayewardenepura.

Study subjects

Test: Subjects (n = 104) who had back pain and confirmed as lumbar disc herniation/degeneration with Magnetic Resonance Image (MRI) by a consultant neurosurgeon and a consultant radiologist. Control: Individuals (n=104) without back pain at least during the previous one month prior to the study.

Data collection

A Standardized, interviewer administered questionnaire was administered to each patient enquiring their socio-demographic data, daily activities, physical and behavioral activities, work status, general health status and current health condition.

Statistical data analysis

Frequencies, percentages and Odds ratios were calculated using SPSS version 20.0. A p value ≤ 0.05 was considered as statistically significant.

Results and Discussion

Among the study subjects, slightly higher percentage were males (51.9 %) whereas other studies have also reported a higher prevalence of LDHD among males. Results of the present study showed that the mean age for cases to be 43.6 ± 15.8 years and for controls 43.2 ± 15.2 years. A higher percentage of female patients (16.3 %) were affected with LDHD at the age group 51 – 60 years, whereas males were affected (15.4 %) at a younger age group of 31 – 40 years. Studies have shown that LBP associated with LDHD is most common in the fourth to fifth decade of life, present study findings of mean age correlate well with the majority of reported studies [2].

On enquiry, majority of cases (56.7 %) had not encountered any predisposing conventional factors which cause LDHD. However, most of the cases were engaged in daily physical activities which cause a severe or moderate strain to back compared to controls (Table 1). Some studies on a similar theme have affirmed that heavy lifetime and leisure time physical activities have an association with LBP and LDHD [3]. Interestingly, some studies found contradictory findings suggesting that physical activities during leisure time (either sports or daily physical activities) is not associated with LDHD. However, present study findings suggest that severity of daily physical activities cannot be disregarded in LBP associated with LDHD.

Numerous studies have found that there is a significant association between LDHD and strenuous sporting activities [3]. Although a high percentage of cases (46.2%) and controls (44.2 %) of the present study had engaged in sports, the findings suggest that there is no significant difference between cases and control (Table 1).

Present study emphasizes that there is a significant association in the level of physical demanding nature of occupation (occupational risk factor) between cases and controls. It was revealed that those employed in severe to moderate level of risk of occupation had a 5.96 fold risk for LDHD when compared to those employed in light or non-risk occupations (Table 1). Findings regarding the association of occupational risk factors and LDHD are in accordance with several reported studies [3, 5].

Smoking has been found to be a major risk factor for LDHD in many studies and findings of the present study are in agreement with this finding, (Table 1). It is suggested that nicotine in cigarettes may cause narrowing of blood vessels and hence impair the flow

of blood and nutrients to the disc causing disc cells to degenerate. However, consumption of alcohol did not have a significant association with LDHD.

Table 1: Distribution of behavioral and occupational risk factors among cases and controls

Variable	Cases		Controls		Odds ratio (95 % CI)
	n	%	n	%	
(i) Severity of daily physical activities					3.01*
(a) Heavy/moderate strain to back	66	63.5	38	36.5	(1.7 - 5.3)
(b) Light strain/sedentary	38	36.5	66	63.5	
(ii) Engaged in sports					1.08
(a) Yes	48	46.2	46	44.2	
(b) No	56	53.8	58	55.8	(0.62 -1.86)
(iii) Level of physical demanding nature of occupation					5.96*
(a) Severe and moderate	8	13.1	2	2.5	
(b) Light and others	53	86.9	79	97.5	(1.22 – 29.18)
(iv) Social habit					3.87*
(a) Smokers	17	16.3	05	4.8	
(b) Non-smokers	87	83.7	99	95.2	(1.37 – 10.92)
(c) Alcohol consumers	33	31.7	29	27.9	1.20
(d) Non alcohol consumers	71	68.3	75	72.1	(0.68 – 2.18)

n=number of subjects

Conclusions and Recommendations

Present study confirms that LDHD is predominant in the fourth to fifth decade of life. Furthermore, the current study showed that a high level of leisure-time physical activity caused a severe to moderate strain to back, in addition to the occupational factors and smoking as risk factors for LBP associated with LDHD. Based on the study findings, it is recommended that proper ergonomics be followed when handling heavy physical and mechanical loads either as leisure-time activities or as demanded by the occupation.

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