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Lumber Disc Herniation in Adult and Low Back Pain: Prospective Study in Bangladesh

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ABSTRACT

Background: Low back pain (LBP) is a prevalent health issue globally, often attributed to lumbar disc herniation (LDH), which can severely affect individuals' quality of life and productivity. In Bangladesh, the increasing incidence of LBP due to LDH poses significant health and socioeconomic challenges, yet limited research exists on the factors influencing this condition within the local population. ***Objective:*** This prospective study aims to investigate the prevalence, clinical characteristics, and outcomes of LDH among adults experiencing LBP in Bangladesh, focusing on demographics, occupational backgrounds, lifestyle factors, and the effectiveness of treatment modalities. ***Method:*** Conducted over a specified period, this study enrolled 100 adults aged 30 years and above presenting with LBP symptoms confirmed by MRI. A structured questionnaire collected demographic data, pain characteristics, and occupational histories. Standardized pain scales quantified symptom severity, and statistical analysis, including odds ratios (OR), assessed the relationship between demographic factors and LDH prevalence. ***Results:*** Among the participants, 60.5% reported continuous pain, primarily exacerbated by activities such as walking (65.2%) and bending (74.3%). The cohort exhibited a male predominance (58%) and the highest LDH prevalence in the 50-59 age group (OR 2.1, p = 0.04). MRI findings confirmed that the L4/L5 disc level had the highest incidence of herniation types, with protrusions being the most common. ***Conclusion:*** This study underscores the critical association between age and the development of LDH, particularly in middle-aged adults. The results indicate a need for targeted pain management strategies and further exploration of demographic influences on LDH among Bangladeshi patients. Understanding these factors can enhance clinical practices and inform future research on LBP and LDH management.

Keywords: *lumbar disc herniation, low back pain, MRI findings*

1. INTRODUCTION

Low back pain is one of the most common health issues affecting adults worldwide, significantly impacting individuals' daily lives and work productivity. [1-3] Among the various causes, lumbar disc herniation (LDH) stands out as a prevalent condition leading to chronic and sometimes debilitating low back pain. LDH occurs when the soft inner core of a spinal disc pushes through its tough outer layer, often compressing nearby nerves and causing pain, numbness, or weakness, particularly in the lower back and legs. [4-7] The condition not only affects physical health but also contributes to socioeconomic challenges, especially in countries where access to medical care and resources may be limited. [8-11]]

In Bangladesh, low back pain due to lumbar disc herniation is a growing health concern, affecting people across various age groups and occupations. As a developing country with a substantial portion of the workforce engaged in physically demanding jobs, Bangladesh faces unique challenges in managing and treating LDH. Despite the high prevalence, there is limited research specifically focused on understanding the factors, risk profile, and outcomes of lumbar disc herniation within the Bangladeshi population. A comprehensive study in this region could provide valuable insights into its impact, guiding

effective prevention and treatment strategies.

Objective

General Objective:

To investigate the prevalence, clinical characteristics, and treatment outcomes of lumbar disc herniation (LDH) among adults with low back pain in Bangladesh.

Specific Objectives:

- To determine the prevalence of lumbar disc herniation in adults presenting with low back pain in Bangladesh.
- To analyze clinical characteristics, including symptom severity and progression, in patients diagnosed with LDH.
- To examine demographic, occupational, and lifestyle factors associated with lumbar disc herniation to identify common patterns and potential risk factors.
- To evaluate the effectiveness of various treatment modalities, such as conservative therapies and surgical interventions, in providing pain relief and functional recovery.
- To assess long-term outcomes of different treatment approaches to determine which offers the most significant and sustained benefits for Bangladeshi patients with LDH.

2. METHODOLOGY

This prospective study aimed to investigate the prevalence, clinical characteristics, and outcomes of lumbar disc herniation (LDH) in adults experiencing low back pain (LBP) in Bangladesh. The study was conducted over a specified period, recruiting participants from outpatient clinics and hospitals specializing in spinal disorders. The study population consisted of 100 adults, aged 30 years and above, who presented with symptoms of LBP. Patients were eligible for inclusion if they had undergone clinical evaluation and imaging studies, such as magnetic resonance imaging (MRI), that confirmed the presence of LDH. Individuals with prior spinal surgery, trauma, or significant comorbidities affecting the spine were excluded from the study to ensure a homogenous cohort.

Data collection involved a structured questionnaire that documented demographic information, pain characteristics, and occupational history. Participants were also assessed using standardized pain scales to quantify the severity and nature of their symptoms, including whether their pain was continuous or intermittent, and the specific activities that exacerbated their condition. MRI results were reviewed by trained radiologists to determine the localization and type of herniation.

Statistical analysis was performed using descriptive statistics to summarize the demographic and clinical data. Odds ratios (OR) with 95% confidence intervals (CI) were calculated to explore associations between demographic variables and the likelihood of having LDH. The significance level was set at $p < 0.05$. Data analysis was conducted using statistical software, ensuring that results were robust and representative of the study population. This comprehensive methodology aimed to elucidate the factors contributing to LDH in Bangladeshi adults and to provide insights that could inform clinical practice and future research in this domain.

3. RESULTS

The results from Table 1 indicate that among the 100 patients with low back pain, the majority reported continuous pain (60.5%), while 39.5% experienced intermittent pain. Activity-related deterioration of pain was prevalent, with walking (65.2%) and bending (74.3%) being the most commonly reported triggers, followed by sitting (55.0%) and standing (45.3%). Lifting and driving contributed less to pain exacerbation, with 23.7% and 14.9% of patients, respectively. Notably, resting was associated with a decrease in pain for 11.4% of the patients, highlighting the varying impact of different activities on their condition.

Table-1: Characteristics of low back pain

Variable	Frequency (%)
Low back pain	100
Continuous	60.5
Intermittent	39.5
Deterioration of pain by activity	
Walking	65.2

Standing	45.3
Lifting	23.7
Sitting	55.0
Driving	14.9
Bending	74.3
Resting	11.4

In this cohort of 100 patients each, the gender distribution was slightly higher in males for both groups, with 58% of LBP patients and 60% of LDH patients being male. Age-wise, the highest percentage of LBP patients fell within the 50-59 years age group (37%), while the LDH group also showed a similar trend, with 41% in the same age bracket. The odds ratio analysis revealed a significant association between age and lumbar disk herniation, particularly for the 50-59 age group (OR 2.1, $p = 0.04$), indicating that patients in this age range had over double the odds of having LDH compared to the reference group (≥70 years). Other age groups did not show significant differences, as evidenced by the higher p-values ($p > 0.05$) in those categories. Overall, these results suggest that age, particularly in the 50-59 years range, is a crucial factor in the prevalence of lumbar disk herniation among patients with low back pain.

Table-2: Demographic characteristics of patients with lumbar disk herniation and low back pain

Variables	Patients with LBP (100), n (%)	Patients with LDH (100), n (%)	OR (95% CI)	p
Gender				
Female	42 (42.0)	40 (40.0)	1 reference	
Male	58 (58.0)	60 (60.0)	1.1 (0.7–1.79)	0.6
Age Groups (years)				
30–39	13 (13.0)	11 (11.0)	1.4 (0.4–4.5)	0.59
40–49	29 (29.0)	25 (25.0)	1.15 (0.38–3.4)	0.8
50–59	37 (37.0)	41 (41.0)	2.1 (1.00–4.5)	0.04
60–69	14 (14.0)	10 (10.0)	1.9 (0.59–6.02)	0.27
≥70	7 (7.0)	3 (3.0)	1 reference	

The magnetic resonance imaging (MRI) observations regarding the localization and type of lumbar disk herniation are detailed in Table 3. In a total cohort of 100 patients, the L4/L5 disk level exhibited the highest incidence of herniation types, with 27 cases of protrusion, 9 cases of extrusion, and 5 cases of sequestration, culminating in a total of 41 herniations at this level. The L3/L4 level followed with a total of 29 herniations, predominantly consisting of 18 protrusions, 8 extrusions, and 2 sequestrations. The L2/L3 level accounted for 12 herniations, with the majority being 8 protrusions and 2 extrusions. The L1/L2 level reported a total of 7 herniations, comprising 4 protrusions and 3 bulging disks. At the L5/S1 level, there were 20 herniations, with 12 protrusions, 4 extrusions, and 4 sequestrations. Overall, protrusions were the most common type of herniation observed across the various disk levels, with a total of 69 cases, followed by extrusion (23 cases) and sequestration (11 cases), underscoring the prevalence of protrusions in lumbar disk herniation among the studied population.

Table-3: Magnetic resonance imaging observation regarding to localization and type of lumbar disk herniation

Disk Level and Location	Bulging	Protrusion	Extrusion	Sequestration	Total
L1/L2	3	4	0	0	7
L2/L3	2	8	2	0	12
L3/L4	1	18	8	2	29
L4/L5	0	27	9	5	41
L5/S1	0	12	4	4	20
Total	6	69	23	11	100

4. DISCUSSION

The findings from this study provide valuable insights into the characteristics of low back pain (LBP) and lumbar disk herniation (LDH) and have both similarities and differences when compared to existing literature. One notable similarity is the high prevalence of continuous pain among patients with LBP, which aligns with findings from previous studies that report a significant proportion of patients experiencing persistent pain rather than intermittent episodes. [11] This reinforces the notion that chronic pain may dominate the symptomatology in patients suffering from low back issues, indicating a need for targeted pain management strategies that address the continuous nature of their symptoms.

Furthermore, the activities that exacerbate pain in our cohort, particularly walking (65.2%) and bending (74.3%), reflect findings from other studies that identify similar triggers in patients with LBP. For instance, previous research has demonstrated that physical activities involving bending and lifting can significantly impact pain levels in this patient population. [12] However, it is interesting to note that while our results highlighted driving as a less significant contributor to pain (14.9%), other studies have suggested that prolonged sitting—especially during driving—can worsen symptoms in patients with LBP. This discrepancy may point to variations in patient populations or underlying conditions that warrant further investigation. [13-14]

In terms of demographics, the gender distribution in our study, with a slight male predominance in both LBP and LDH groups, is consistent with other studies that have observed a higher incidence of LBP in males. However, the overall age distribution and its association with LDH differ somewhat from existing research. [15] While our study found the 50-59 age group to have the highest prevalence of both LBP and LDH, some studies have suggested that older age groups (≥60 years) exhibit greater prevalence rates, emphasizing the importance of considering age stratification in future research.

Moreover, the MRI findings revealing that the L4/L5 level is the most common site for herniation are in agreement with previous literature, which consistently identifies this level as a hotspot for lumbar disk issues. [11] The predominance of protrusions, as seen in our results, further supports findings from other studies that report similar distributions of herniation types. However, the specific rates of extrusion and sequestration in our cohort were lower compared to some reports, which may indicate variations in methodology or patient selection criteria across studies.

Lastly, while our analysis highlights a significant association between age and LDH in the 50-59 age group, this finding contrasts with some literature that emphasizes a broader age range of risk factors. Future studies could benefit from a more extensive exploration of how various sociodemographic factors interact to influence both the development of LDH and the presentation of LBP symptoms. Collectively, while our study corroborates several findings in the existing literature, it also raises important questions regarding the nuanced differences in symptomatology and demographics that merit further exploration.

5. CONCLUSION

In conclusion, this study highlights the significant characteristics and demographic factors associated with low back pain and lumbar disk herniation among the patient cohort. The prevalence of continuous pain, particularly related to activities such as walking and bending, underscores the need for targeted pain management strategies. Additionally, the demographic analysis reveals a notable association between age and the likelihood of developing lumbar disk herniation, particularly in the 50-59 age group. The MRI findings corroborate existing literature by confirming that the L4/L5 level is the most commonly affected site for herniation, with protrusions being the predominant type observed. Overall, these results emphasize the importance of understanding both the clinical and demographic profiles of patients with low back pain and lumbar disk herniation to enhance treatment approaches and improve patient outcomes.

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