

Lower Back Pain due to Lumbar PIVD Evaluation by MRI: A Cross- Sectional Study

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Abstract

Background: Lower back pain due to lumbar PIVD is prevalent most commonly among the age group over 50 years. The main symptom of disc degeneration after low back pain is sciatica. There are many risk factors associated with lumbar degenerative disc disease like advancing age, smoking, obesity, trauma, heavy weightlifting, height and genetic factors.

Methodology: A cross sectional study was conducted among 210 patients of lower back pain referred from Department of Orthopedics, JNIMS. They were then evaluated by MRI (3 Tesla Phillips) in the Radiology and Imaging Department, JNIMS. Multiple level disc involvement is common as compared to single level disc involvement in this study.

Results: L4-L5 and L5-S1 Disc degeneration changes was seen mostly at L4-L5 and L5-S1. X Ray LS spine with AP and Lateral views reveal gross anatomic changes in the intervertebral discs.

Conclusions: MRI Lumbo-sacral spine is the standard imaging modality for detecting Lumbar PIVD due to lower backache.

Keywords: PIVD, Lumbar, MRI, Lower Back Pain.

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Introduction

The term “Prolapsed disc” means the protrusion and extrusion of the nucleus pulposus through a rent in annulus fibrosus. Herniated nucleus pulposus is most common in those aged below 40 years, while degeneration of discs tends to affect

those aged over 40 years, with the prevalence increasing with advancing age. Disc lesions of the lumbar spine are more common than the cervical spine and disc lesions of the thoracic spine are rare. The symptoms may be felt in one or more of the lumbar nerve roots. About 90% of cases of

sciatica are caused by a herniated intervertebral disc. This most commonly occurs at the L5/S1 level[1].

Herniation of disc or nucleus pulposus is the main cause of low back pain[2]. The back pain is a major public health problem in western industrialized societies. It causes suffering and distress to patients and their families and affects a large number of people. The prevalence rates in a number of studies ranged from 12% to 35% with around 10% of sufferers becoming chronically disabled[3]. Low back pain affects about 80% of the population at some time in their lives and is one of the most frequent reasons for consulting a primary care physician[4].

Investigations for diagnosis of PIVD commonly used were X-ray and CT-scan. MRI is a new diagnostic tool coming up for diagnosis and for proper treatment. This study was conducted to evaluate the age and sex distribution and level and number of discs affected in lumbar disc PIVD disease by MRI due to lower back pain.

Materials and methods: This cross-sectional study was conducted in the Department of Radiology and Imaging, JNIMS, Imphal East in collaboration with the Departments of Orthopedics from July 2017 to August 2020. In this study, all the patients who presented with Lower Backache unresponsive to conservative management for 4 weeks were included. There was a total of 464 patients of lower back pain attending orthopedics OPD during the study period, out of which 210 patients were included after clinical examination (Table 1) in the study. They were then evaluated by MRI (3 Tesla, Phillips) in the Radiology and Imaging Department JNIMS. Data were collected using a pre-determined performa and entered in Microsoft excel 2007. Data were analysed using IBM SPSS ver. 16. Data were described using mean and percentages. Ethical approval was taken from the institutional ethics committee and confidentiality was maintained throughout the study.

Table 1: Neurological deficit in disc prolapse

Level	Nerve root affected	Motor weakness sensory	Sensory loss	Reflexes
L5-S1	S1 root	Weakness of planter flexors of the foot	Over lateral side of foot	Ankle jerk sluggish or absent
L4-L5	L5 root	Weakness of EHL and dorsiflexors of foot	Over the dorsum of foot and lateral side of leg	Ankle jerk normal
L3-L4	L4 root	Weakness of extensors of the knee	Over great toe and medial side of leg	Knee jerk sluggish or absent

Results

In this study out of 464 patients, 210 were included and analysed. Majority of the patients were over 40 years with maximum of them were in the age group >60 years (Figure 1). Out of the 210 patients, 60.9% were male, and 39.1% were female (Figure 2). Single disc involvement occurred in

25.7% of the patients and so multiple in 74.3% (Figure 4 & 5). Discs involvement at two levels was seen in 43.8% of the cases. In 34.3%, involvement of discs was seen at three levels. L4-L5 level disc was affected in majority of the patients followed by L5-S1, L3-L4 IV disc and L1-L2 IV disc (Figure 3).

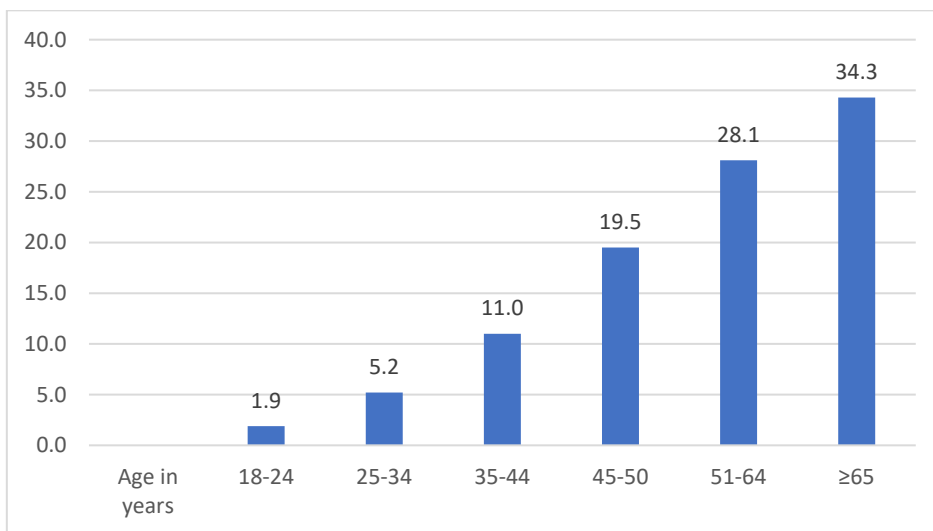


Figure 1: Bar diagram showing age distribution of the respondents

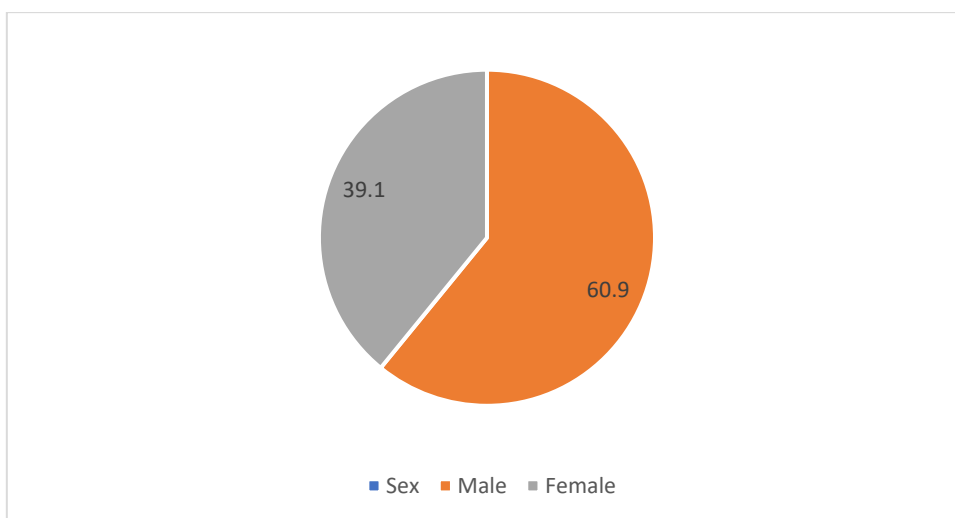


Figure 2: Pie chart showing sex distribution of the respondents

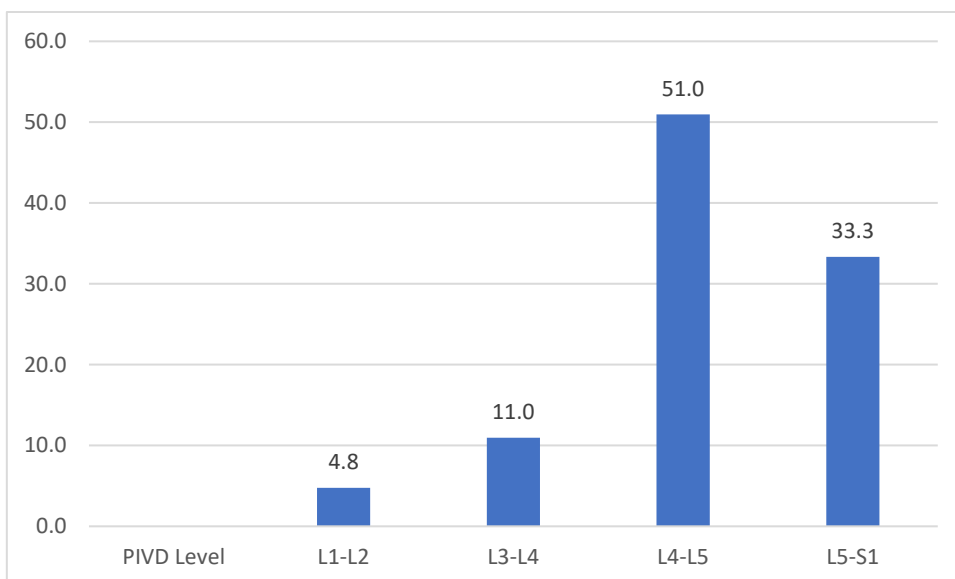


Figure 3: Bar diagram showing PIVD level of the respondents

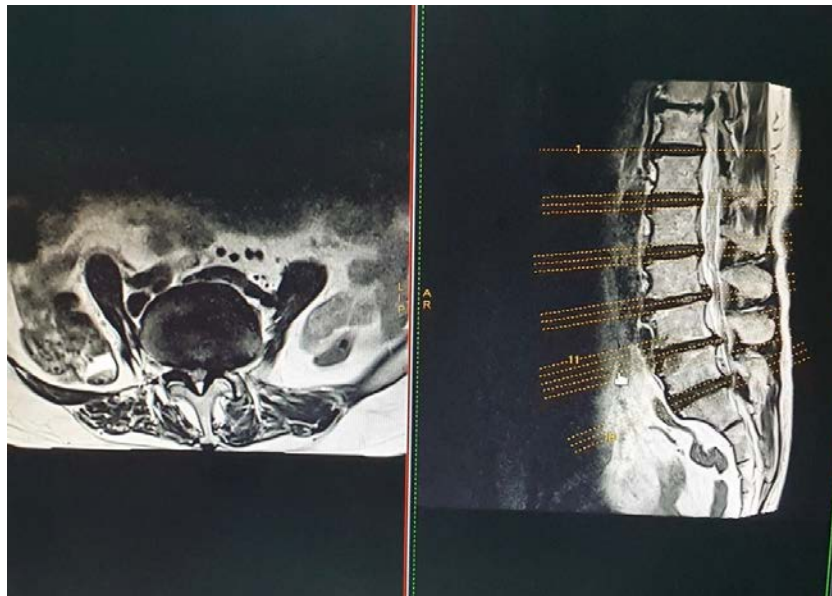


Figure 4: T2 sag image showing lumbar spondylosis, multilevel lumbar disc desiccations and PIVD involving multiple lumbar IV discs. Axial T2 image showing diffuse Central and bilateral paracentral disc bulge in L4-5 IV disc causing narrowing of bilateral neural foraminas with indentation on anterl thecal sac thereby the cauda equina nerve roots and on bilateral exiting nerve roots.

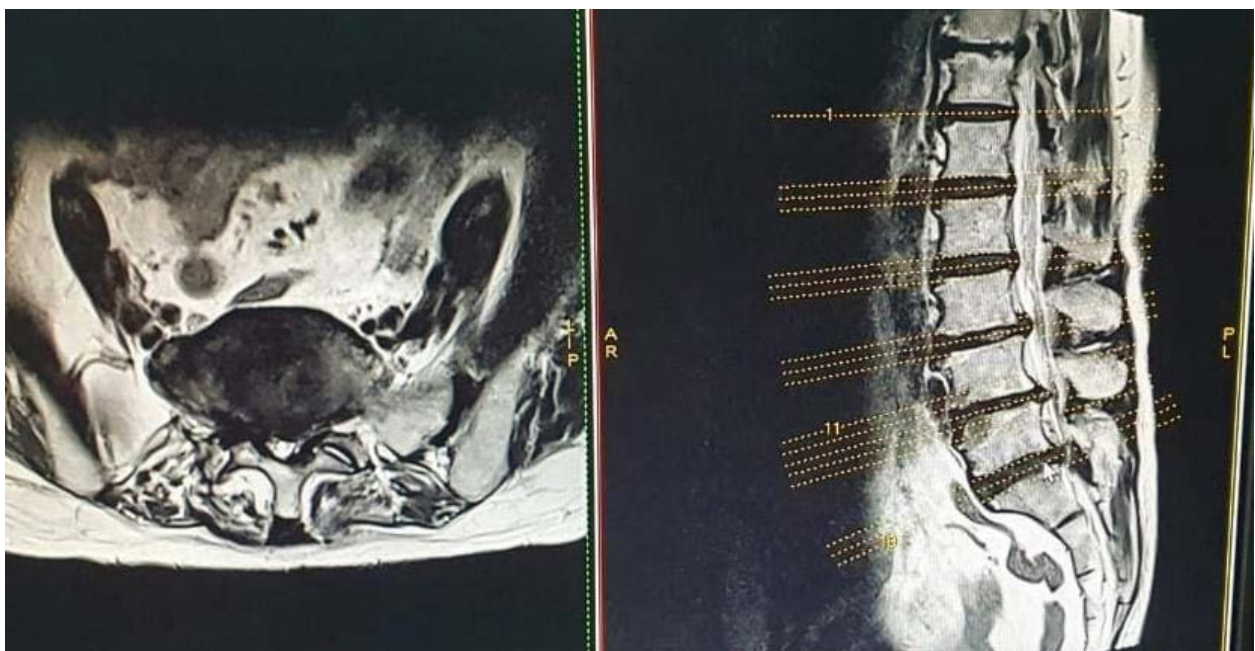


Figure 5: T2 sag image showing lumbar spondylosis, multilevel lumbar disc desiccations and PIVD involving multiple lumbar IV discs. Axial T2 image showing diffuse Central and bilateral paracentral disc bulge in L5-S1 IV disc causing narrowing of bilateral neural foraminas with indentation on anterl thecal sac thereby the cauda equina nerve roots and on bilateral exiting nerve roots.

Conclusion

Lumbar disc degeneration is the most common cause of low backache. Men are

more commonly affected. Multiple level disc involvement is commoner as compared to single level disc involvement. L4-L5 and L5-S1 level discs are most commonly

affected due to disc degeneration changes. X Ray LS spine with AP and Lateral views reveal gross anatomic changes in the intervertebral discs. MRI Lumbo-sacral spine is the standard imaging modality for detecting disc disease.

Discussion

Lower back pain secondary to lumbar PIVD is a condition that affects most people over 30 years[5] This is in concordance with the finding in this study where commonest age group for PIVD was over 40 years. Male predominance of PIVD was seen in this study. This is as expected because of the type of work of males. Similar finding was observed in the study by Weiler C et al[6] and Sarla GS[7] where 61.9% and 73.7% of the patients were males respectively. Involvement of lumbar vertebrae was the commonest in this study. This was in concordance with the study by Sarla GS⁷ where L4-L5 level disc was affected in 74% of the patients.

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