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Study to evaluate non-traumatic low backache using magnetic resonance imaging, in a tertiary care centre, Siddipet District, Telangana state

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Abstract

Introduction: Commonest complaints in patients and one of the most common causes of disability is low backache. Patients with low backache require immediate evaluation and diagnostic imaging is the only approach to know the cause and plan the appropriate management.

Methodology: Hospital based cross sectional study, conducted for one year period (Jan 2019 TO Dec 2019) among adult patients presenting with non-traumatic low backache. MRI investigation of Lumbosacral spine was done and imaging features were studied. This study was done on 50 patients in Department of Radiology, RVM Institute of Medical sciences.

Results: Maximum numbers of patients were found in the age group between 30 to 50 years (48%). The three common etiologies observed in this study are degenerative disc disease (70%) followed by Degenerative spondylolisthesis (18%) and infections as (12%). The abnormalities observed during the study in the participants are commonly Disc bulge (60%) followed by Disc desiccation (46%), Osteophytes (46%), spinal stenosis (34%), vertebral compression among (15%), spondylolisthesis (12%) and facet joint arthropathy in (9%)

Conclusion: MRI is the best diagnostic imaging modality in detecting the causes of low backache, thereby appropriate management can be planned to resolve the pain.

Keywords: Magnetic resonance imaging (MRI), Disc Bulge, Disc desiccation, spinal stenosis, spondylolisthesis, Osteophytes

Introduction

Back pain is strongly associated with degeneration of the intervertebral disc. Spine degeneration is a global problem, in this condition prevalence increases with age. It ranges from 85% to 95% among adults aged 50 to 55 years, with no sex difference. Frequently ordered for low backache are X-rays. These are cost effective and readily available. The limitations are findings, which are very limited that alter management, poor relationship between most radiographic abnormalities and symptoms of low backache^[1]. This makes evaluation by MRI more reasonable, which detects the cause of low backache in a majority of patients. The present study was undertaken to determine the various causes of low backache and their MRI patterns. In the present scenario MRI plays an important role in evaluation of low backache to identify the pathology. MRI has good soft tissue resolution, disc material can be well visualized, any bony pathology can be identified and pathology in the spinal canal can be found and evaluated². Aim and Objective of this study is to evaluate various causes of low backache along with their prevalence and to study the findings of MRI in patients with non-traumatic low backache.

Methodology

Hospital based cross sectional study, conducted for one year period among adult patients presenting with non-traumatic low backache. MRI investigation of Lumbosacral spine was done and imaging features were studied. This study was done on 50 patients in Department of Radiology, RVM Institute of Medical sciences. Ethical committee clearance was obtained from institutional ethics committee, prior to the study.

Inclusion criteria: Patients with complaints of low backache referred to Department of Radiology for MRI.

Exclusion criteria: H/o trauma, previous history of surgery, not given consent for the study.

Analysis: SPSS 20th version was used; Chi-square test was used to compare between symptomatology and MRI findings and p-value of <0.001 was considered to be statistically significant.

Results

Out of the 50 patients in this study there were 27 males (54%) and 23 females (46%). The age of the patients ranged from 26 years to 75 years. Maximum numbers of patients were found in the age group between 30 to 50 years (48%).

Table 1: Types of abnormalities among the study participants

Type of abnormality	Percentage (%)
Disc Bulge	60%
Disc desiccation	46%
Disc Protrusion	
1. Paracentral	4%
2. Central	7%
Osteophytes	46%
Spinal stenosis	34%
Facet joint arthropathy	9%
Vertebral compression	15%
Spondylolisthesis	12%

The abnormalities observed during the study in the participants are commonly Disc bulge (60%) followed by Disc desiccation (46%), Osteophytes (46%), spinal stenosis (34%), vertebral compression among (15%), spondylolisthesis (12%) and facet joint arthropathy in (9%). (Table 1)

Diffuse Disc bulge was most commonly observed at the level of L4-L5 followed by L5-S1. Multiple levels are involved in 18 patients and single level involvement was observed in 12 patients. Disc bulge was seen in 60% of the cases. In herniated discs, commonly observed was disc protrusion. Central disc bulge was present in 7% of total study population, most commonly involving L4-L5 and L5-S1 levels. In present study, central disc protrusion was most common. Disc protrusion among males and females is equally observed. Most common age of presentation for protruded disc was 35 – 50 yrs. Disc Desiccation observed in 46% among the study population which increased with age, common level of disc desiccation was seen at the level of L5-L6 followed by L6-S1, involvement at multiple levels was noted. Most commonly seen in the age group 60-75 yrs. Marginal osteophytes were noted in 23 patients comprising 12 males and 11 females. Vertebral compression is seen in 15% of the study population with most common finding being anterior wedge compression observed in 70% of cases. Facet joint arthropathy was observed in 9% of the study participants. Spinal stenosis was present in 34% of cases. 7 Males and 10 females. Females were affected more than males. L3-L4 intervertebral discs were most frequently affected by spinal stenosis followed by L5-S1. Age groups which were commonly affected with spinal stenosis were 50-60 yrs. constituting 52%, followed by 40- 50 yrs. age group which had 46% affected population. Present study revealed bilateral lateral recess stenosis in 53% followed by bilateral foraminal stenosis in 15% and central stenosis in 9%. Degenerative spondylolisthesis was observed in 12% of cases, with equal sex predominance. Common site being

L5-L6 levels, among females it was observed as L5 over S1.

Table 2: Showing most common etiologies observed among the study participants

Etiology	Number	Percentage (%)
Degenerative Disc disease	35	70%
Degenerative spondylolisthesis	9	18%
Infection	6	12%
Total	50	100%

The three common etiologies observed in this study are degenerative disc disease (70%) followed by Degenerative spondylolisthesis (18%) and infections as (12%). In this study the most common level of disc bulge was at the level of L4-L5 and according to statistical analysis as compared with other levels there was a statistical significance noted when compared to other levels, (p value <0.001). The most common level of disc desiccation was seen at the level of L5-L6 followed by L6-S1, commonly involving at multiple levels and according to statistical analysis as compared with other levels there was a significant statistical difference between L5-L6 and other levels (p value<0.001). In this study degenerative spondylolisthesis observed commonly at L5-L6 level, almost all the patients who had degenerative listhesis had it at the level of L5-S1 which was statistically significant (p value of <0.001).

Discussion

In this study male preponderance was noted (54% males and 46% females) which is similar to many other studies on low backache and this study found the highest number of patients with low backache to be in 30-50 yr. age group (48%). Similar study conducted by Mustapha Z *et al.* [3] findings in MRI of lumbosacral spine had overall male predominance with 235 (65.8%) males and 122 females (34.2%) which is similar with this study and a study conducted by R Prasad *et al.* [4] also had male predominance similar to this study, with 65.6% males and 34.4% females in their study, most common age of presentation was 31-40 yrs. (33.3%) followed by 21-30 yrs. (23.3%), study conducted by Younis *et al.* [5] reported, 60% were male patients and 40% were females which is comparable to this study. The three common etiologies observed in this study are degenerative disc disease (70%) followed by Degenerative spondylolisthesis (18%) and infections as (12%), these study findings are similar with the study done by Sathish Babu *et al.* [1] on application of MRI in low backache, which had 74% cases presenting with degenerative, 8% non-traumatic spondylolisthesis and 3% Infective cases. Diffuse Disc bulge was most commonly observed at the level of L4-L5 followed by L5-S1. Multiple levels are involved in 18 patients and single level involvement was observed in 12 patients, this above findings are similar with the study conducted by Mustapha Z *et al.* [3] findings in MRI of lumbosacral spine had commonest finding of disc prolapse 45.2% (n=252), other similar study also concluded the same results, which was conducted by saisudha *et al.* [6] which also showed most common finding among patients with low backache to be diffuse disc bulge in 85% cases and most common level of disc bulge in their study was at L4-L5 (36.7%) followed by L5-S1 (26%) cases. This study is comparable to Younis *et al.* [5]; in their study disc bulge was most frequent finding (74%) in patients with low backache. Most common level of

disc bulge was L4-L5 (in 36.7%) followed by L5-S1 (in 26%). The study done by Bhutta *et al.*^[7], showed single disc involvement in 35% and multiple disc involvement in 65% of patients. In herniated discs, commonly observed was disc protrusion. Central disc bulge was present in 7% of total study population, most commonly involving L4-L5 and L5-S1 levels. In present study, central disc protrusion was most common. Disc protrusion among males and females is equally observed. Most common age of presentation for protruded disc was 35 – 50 yrs this findings are comparable with the study conducted by Uduma *et al.*^[8], disc herniation was seen in 33% Among herniated discs, majority (99%) of types of herniation was disc protrusion which is similar to study of Jacob *et al.*, which had disc protrusion in 98% and extrusion in 2% cases. In our study, disc protrusion was present most commonly involving L4- L5 (50%) and L5-S1 (48%) levels. The study conducted by Rai *et al.*^[9] on MRI findings in chronic low back pain revealed disc protrusion in 23%, most commonly involving L5/S1 (35%) level followed by L4/L5 level (30%). In a study on lumbar disc prolapse by Prasad *et al.*^[10], L4-L5 level disc prolapse was most common (34.4%) followed by L5- S1 (26.7%). Disc Desiccation observed in 46% among the study population which increased with age, common level of disc desiccation was seen at the level of L5-L6 followed by L6-S1, involvement at multiple levels was noted. Most commonly seen in the age group 60-75 yrs. similar findings are reported by Raviraj Durganand *et al.*^[11], Disc desiccation was most common finding constituting 91% of 165 study patients. Osteophytes were seen in 46% of the subjects and were 3rd most common finding among all. Marginal osteophytes were noted in 23 patients comprising 12 males and 11 females. This finding is similar to the study done by Rai *et al.*^[9], where 48% patients had osteophytes. Degenerative spondylolisthesis was observed in 12% of cases, with equal sex predominance. Common site being L5-L6 levels, among females it was observed as L5 over S1, this study is similar to study of Dootchai *et al.*^[12] has conducted the study in elderly population of Thailand with lumbar disc degeneration, which had 85% females and 15% males had degenerative spondylolisthesis.

Conclusion

MRI is the best diagnostic imaging modality in detecting the causes of low backache, thereby appropriate management can be planned to resolve the pain. There is a strong association between low back pain and degenerative changes of lumbar spine. The degenerative changes are more common in males than in females. Role of diagnostic imaging in patients with low back pain is to provide accurate anatomical site, which in turn affects the management.

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