



MAGNETIC RESONANCE IMAGING FINDINGS IN LOW BACK ACHE DUE TO LUMBAR DEGENERATIVE DISEASE AND ITS CORRELATION WITH MODIFIED OSWESTRY DISABILITY INDEX IN KIMS & RF, AMALAPURAM.

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ABSTRACT

Low backache or lumbosacral pain is considered the leading cause of disability globally (1). This clinical symptom should be treated appropriately to improve the quality of lifestyle and reduce the morbidity of these patients. Magnetic resonance imaging offers great help in diagnosing the cause and severity of the low backache. Oswestry disability index score (ODI) is used to know about a patient functional disability based on a questionnaire. The present study is a cross-sectional study of 60 middle-aged patients where there is a correlation between the obtained radiological findings from MRI with the modified Oswestry disability index score.

KEYWORDS : ODI, MRI, Neural foraminal stenosis, Disc bulge, Endplate changes, Annulus fissure/tear, Lumbar degenerative disease.

INTRODUCTION

Lumbar degenerative disease is one of the common underlying reasons for low back ache which may lead to significant morbidity. If these degenerative changes are causing clinical symptoms, they are referred to as pathological. Because of the heavy mechanical stress, the most common location of these changes is the lumbar spine.

Degenerative changes in MRI may refer to any one or more of the following findings including disc bulge (central, subarticular, foraminal, and extraforaminal) or herniation of the disc (protrusion, extrusion, sequestration, and migration), annulus fissures/tears, modic end plates changes (type I, II, III), facet joint arthropathy, neural foramen stenosis (grade I, II, III), spinal canal stenosis (mild, moderate, severe), schmorl's nodes and osteophytes (2).

Oswestry disability index is a questionnaire that helps in improving the management of patients with lumbar spine disease (3). This is used as a multidimensional tool with the advantages of easy patient communication, for self-assessing and covers a wide domain of function, pain, and limitation in the health condition of the patient (4).

AIMS & OBJECTIVES

The study aims to correlate the MRI findings in lumbar degenerative disease in patients with the severity of the self-assessed modified Oswestry disability index.

MATERIALS & METHODS

The present study is a cross-sectional study done in the department of Radiodiagnosis, Konaseema institute of medical sciences and research foundation, Amalapuram district, Andhra Pradesh over a period of 3 months including 60 consenting middle-aged groups of patients presenting with low back ache including both males and females.

MRI scan was performed on PHILIPS ACHIEVA with a magnetic field strength of 1.5 T using standard MRI spine protocol sequences i.e sagittal T1 and T2-weighted correlated with transverse (axial) T2W-images at the levels of suspected pathology, STIR.

Imaging

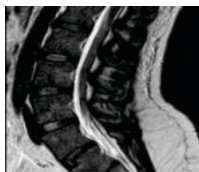


Fig 1. T2 Sagittal Image Shows Schmorl's Node At L5-s1 Level.

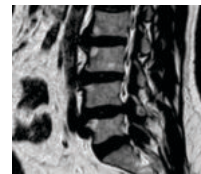


Fig 2. T2 Sagittal Image Shows Marginal Osteophyte At The L5 Level And Disc Desiccation.

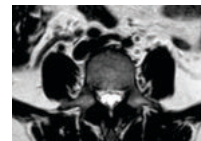


Fig 3. T2 Axial Image Shows Ligamentum Flavum Hypertrophy With Mild Facet Joint Arthropathy.

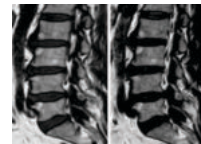


Fig 4. Multilevel Modic Type Ii Endplate Changes In T1 And T2 Sagittal Sections.

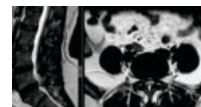


Fig 5. T2 Sagittal And Axial Sections Show Annular Fissure/tear At L5 – S1 Level.

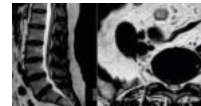


Fig 6. T2 Sagittal And Axial Sections Show Central Disc Protrusion At L5 – S1 Level Causing Spinal Canal Stenosis.

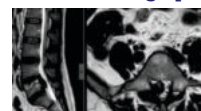


Fig 7. T2 Sagittal And Axial Sections Show Disc Extrusion At The L5-s1 Level.

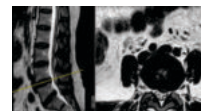


Fig 7. T2 Sagittal And Axial Sections Show Asymmetric Disc

Bulge At L4 – L5 Level Causing Left Neural Foraminal Narrowing And Nerve Root Compression.

RESULTS

In the study of 60 patients, the mean age for the presentation of disc degenerative changes was 20 to 60 years. Most patients (53.3 %) were in the 41-60 age group whereas males (68.3 %) are more commonly involved. Subarticular is the type of disc bulge most commonly involving L4-L5 and L5-S1 intervertebral disc levels. Annulus fissure/ tear is most commonly seen in the L4-L5 intervertebral disc level. Degenerative endplate changes are most common in L4-L5 and L5-S1 intervertebral disc levels. Grade I, II, and III neural foramen stenosis are common in L4-L5 and L5-S1 intervertebral disc levels.

Oswestry disability score is higher in patients with grade III neural foramina stenosis and disc protrusion in the present study.

Table 1: Distribution Of Patients Based On Age-

Age (years)	Number	Percentage (%)
20-40 y	23	38.33
41-60 y	32	53.33
Above 60 y	5	8.33

Table 2: Distribution Of Patients Based On Gender-

Gender	Number	Percentage (%)
Male	38	68.33
Female	22	36.66

Table 3: Distribution Pattern Based On Disc Bulge-

Disc bulge	Number	Percentage (%)
Subarticular	41	68.33
Central	15	25.0

Table 4: Distribution Pattern Based On Oswestry Disability Index Score-

Oswestry score	Number	Percentage (%)
0 - 10	15	25.0
10 - 20	24	40.0
20 - 30	10	16.66
30 - 40	8	13.33
40 - 50	1	1.66

DISCUSSION

In the present cross-sectional study, there is an evaluation of MRI imaging findings in patients with lumbar degenerative disease. The outcome variables evaluated were disc bulge, disc herniation, annulus tear/ fissure, degenerative endplate changes, and neural foramen stenosis. The impact of independent variables like age and gender on these indices was also evaluated.

Most people suffer from low backache at least once in a lifetime. Structural components of the spine responsible for low backache are the degenerative changes involving the intervertebral disc, vertebral periosteum, facet joints, and ligaments (5).

A plain radiograph (x-ray) of the lumbosacral spine is routinely advised as the first investigation in patients with low back pain to identify gross morphological bony changes in the vertebral body and its posterior elements but a complete evaluation of soft issues elements is possible on MRI.

Magnetic resonance imaging (MRI) has been proven to be the mainstay of investigation. When the conservative treatment fails, surgical decompression and stabilization are indicated.

The Oswestry disability index scoring (scale of 0 to 50) is a self-assessment test that takes less than 5 minutes to complete and 1 minute to score, with no training, equipment, or cost requirements. It is used to measure the patient's permanent functional disability and the 'gold standard' of low back

functional outcome tools. It also helps the orthopedician to improve management.

The lack of a relationship between pathophysiology and ODI scores suggests that the disability and pain in neural foraminal stenosis are determined by multiple factors. So, MRI alone should not be considered in isolation when assessing and treating patients diagnosed with lumbar degenerative disease.

CONCLUSION

MRI is the standard non-invasive imaging modality for detecting disc pathology due to its advantage of lack of radiation, and multiplanar imaging capability. MRI better identifies and grades the severity of lumbar degenerative disease giving excellent spinal soft-tissue contrast, and precise localization of intervertebral disc changes.

There is a significant correlation between neural foramina stenosis and the Oswestry disability index since the score is higher in patients with grade III neural foraminal stenosis and disc protrusion in the present study. Therefore, this score acts as an invaluable tool for assessing a patient's functional disability (6).

REFERENCES

1. Zaina F, Balagué F, Battié M, Karppinen J, Negrini S. Low back pain rehabilitation in 2020: new frontiers and old limits of our understanding. *European journal of physical and rehabilitation medicine*. 2020 Mar 25;56(2):212-9.
2. Quint U, Wilke HJ. Grading of degenerative disk disease and functional impairment: imaging versus pathoanatomical findings. *Eur Spine J* 2008;17(12):1705-13.
3. Fritz JM, Delitto A, Welch WC, Erhard RE. Lumbar spinal stenosis: a review of current concepts in evaluation, management, and outcome measurements. *Arch Phys Med Rehabil*. 1998;79:700-708. doi: 10.1016/S0003-9993(98)90048-X. [PubMed] [CrossRef] [Google Scholar].
4. Fairbank JC, Couper J, Davies JB, O'Brien JP. The Oswestry low back pain questionnaire. *Physiotherapy*. 1980;66:271-273. [PubMed] [Google Scholar]
5. De Schepper EI, Damen J, van Meurs JB, Ginai AZ, Popham M, Hofman A, et al. The association between lumbar disc degeneration and low back pain: the influence of age, gender, and individual radiographic features. *Spine* 2010;35(5):531-6.
6. Fairbank JC, Couper J, Davies JB, O'Brien JP. The Oswestry low back pain questionnaire. *Physiotherapy* 1980;66:271-3.