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Original Research Article

Radiological Study of Lumbar Disc Degeneration and its Clinical Significance

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ABSTRACT

Introduction: Intervertebral disc is a complex structure consisting of highly specialized connective tissue, a combination of hyaline cartilage, fibrocartilage, mucopolysaccharide & dense collagen fibers. Spondylosis or degenerative disc disease of lumbar spine is common musculoskeletal disorder in the elderly people. The prevalence of lumbar spondylosis increases with age also the occurrence of low back pain & disability.

Material and Methods: MRI from 50 elderly people ranging from 40 years and above were taken and divided into 4 consecutive groups such as people between 40 to 50, 50 to 60, 60 to 70 & above 70 years. The rate of degeneration was graded into grade-0,1,2,3 for normal, mild, moderate, and severe respectively. The MRI were assessed for presence of lumbar disc degeneration. The observations were noted and statistical analysis was done.

Results: Demographic profile of study subjects shows that degeneration was more common problem among female compared to male and there was no much variation in relation to age distribution of study subjects A total of 50 subjects 40years and above were enrolled & divided into 4 consecutive groups such as people between 40 to 50, 50 to 60, 60 to 70 years (mean; 55.01± 10.33 years) Grades of lumbar degeneration were correlated with decadal age. Severity of degeneration was proportionately increasing with the increasing age

Conclusion: Lumbar disc degeneration was highly prevalent with age. Education on life style modification should be implement for health promotion and primary prevention

Keywords: Magnetic resonance imaging, spinal degenerative disease, low back pain, degeneration, lumbar disc

INTRODUCTION

Lumbar degenerative disc disease occurs when damaged discs in the lumbar spine generate pain sensations. Degenerative spinal disease is a widespread issue. Its incidence rises as people get older. It varies from 85% to 95% among adults aged 50 to 55, and there is no gender difference.[1,2] According to Hult, up to 80% of the population is affected by this condition at some point in their lives.[3] The term "degenerative disease of the lumbar spine" refers to a condition in which the intervertebral disc and neighboring spinal structures are impaired as a result of ageing and pathologic processes.[4] Intervertebral discs (IVDs) are strong, fibrous structures that act as ligaments between vertebrae, absorbing pressure and cushioning the spine. Discs are flexible but strong enough to allow for movement such as forward, backward, and side to side bending.[5] Individuals with lumbar degenerative disease might be symptomatic or asymptomatic, while the condition is most usually asymptomatic.[6,7] Degeneration of the

intervertebral disc is significantly linked to back discomfort.[8] Mechanical compression of neuronal components caused by disc herniation, as well as direct biochemical and inflammatory effects, are all potential origins of pain.[9] Diagnostic imaging in spine degenerative disease is used to assess the condition of neural tissues and to influence therapy decisions.[10] Because plain radiography cannot show the structural morphology of the intervertebral disc, it can only provide limited diagnostic information. For the examination of degenerative lumbar spine problems, MRI has become the standard imaging method. Current MRI techniques can also be used to assess the intervertebral disc, vertebrae, ligaments, spinal canal, and neural foramina. With this background present study was to identify the prevalence of lumbar disc degeneration in population of Maharashtra. Anatomical cross-sectional imaging and disco-graphic findings of individuals referred for MRI for low back pain were examined in this study.

MATERIALS AND METHODS

This was descriptive cross-sectional research conducted in MGM hospital in Navi Mumbai. The purpose of the study was to determine the pattern of lumbar disc degeneration seen in the patients from western Maharashtra region. MRI from 50 symptomatic referred patients for the complaints of lower backache since 1year and age above 40 years were enrolled as a study subjects. Subjects were divided into 4 consecutive groups such as age between 40 to 50 years, 50 to 60 years, 60 to 70 years & above 70 years. The MRI was assessed for presence of lumbar disc degeneration. The rate of degeneration was graded into grade-0, 1, 2, and 3 for normal, mild, moderate and severe respectively. The authority granted permission to perform the study in the Radiology department. A trained radiographer did the imaging. The 0.03OTscanner was used for the lumbar spine MRI (XinAoMDT). Data analysis was done by using the software statistical package for social sciences (SPSS) software and using Open-Source epidemiological statistics for public health version 2.3.1.

RESULTS

Demographic profile of study subjects shows that degeneration was more common problem among female compared to male and there was no much variation in relation to age distribution of study subjects (Table-1). A total of 50 subjects 40 years and above were enrolled & divided into 4 consecutive groups such as people between 40 to 50, 50 to 60, 60 to 70 years (mean; 55.01±10.33 years) Grades of lumbar degeneration (Figure 1-3) were correlated with decadal age. Severity of degeneration was proportionately increasing with the increasing age (Table-2 & Figure 4).

Demography	Total no. of patients	Percentage of Patients
Age Group in years		
40 to 50	12	24
50 to 60	12	24
60 to70	12	24
>70	14	28
Gender		
Male	21	42
Female	29	58
Residence		
Urban	39	78
Rural	11	22

Table-1: Demographic profile of patients included in study

Figure-1: Mild reduction in height at L4-L5 disc

Age group	Normal Grade 0	% of Grade 0	Mild Grade 1	% of Grade 1	Moderate Grade 2	% of Grade 2	Marked Grade 3	% of Grade 3
40 to 50	6	50	3	25	2	16.67	1	8.33
50 to 60	2	15	3	25	4	33	3	25
60 to70	0	00	2	15	5	41.6	5	41.6
>70	0	00	2	14.28	6	42.85	6	42.85

Table-2: Grades of degeneration with age

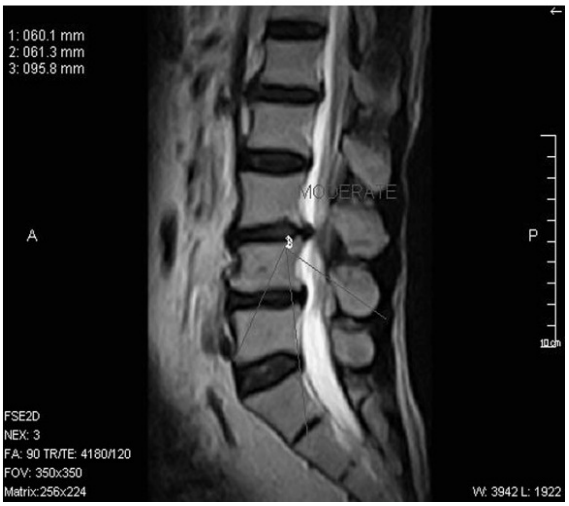

Figure-2: Moderate reduction in height at L3-L4 disc

DISCUSSION

The prevalence and severity of lumbar spondylosis and listhesis increased with age as expected from the physiologic degenerative process. More degree of degeneration found in males corresponded to previous autopsy and radiographic studies. Systemic review showed that only the severe pain group that had back pain prevalence increasing with age. Lumbar disc degeneration and low back pain were highly prevalent in Thai elderly.[10-13]

The variation in predominance between young and old people could be due to the ageing process. When interpreting MRI scans of patients with radiculopathy, these radiological abnormalities should be given additional attention. Although MRI demonstrated a significant prevalence of lumbar degenerative imaging findings in this investigation, MRI may also reveal abnormalities in asymptomatic persons.[14] Diagnostic imaging's purpose is to offer correct anatomical information and to influence management decisions. This hospital-based cross-sectional study employed MRI to assess degenerative changes in the spine because it has superior tissue segregation and can detect degenerative changes earlier than other imaging modalities such as CT scan.[15] For proper therapeutic recommendations, MRI data must be correlated with patient age, clinical indicators, and symptoms after a thorough physical examination.

Figure-3: Severe Reduction in height at L2-L3 disc

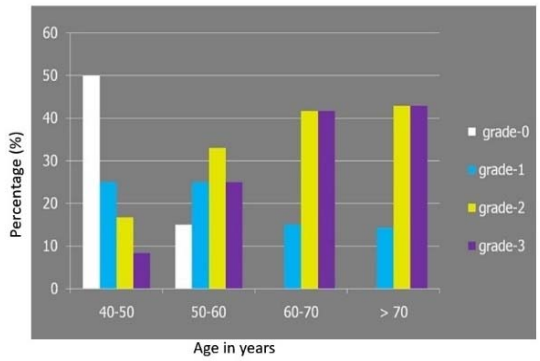

Figure-4: Correlation of lumber disc degeneration with percentage and age group in years

CONCLUSIONS

Lumbar disc degeneration is highly prevalent with age. Patients with low back pain have a strong link to degenerative changes in the lumbar spine as seen on MRI. Degenerative alterations in the lumbar spine are more common in men than in women as they get older. On MRI, 90 percent of the patients tested have degenerative abnormalities. The most common finding is disc budge. Disc herniation is the least common finding, with extrusion being more prevalent and usually occurring posterolaterally. The patients who had LBP with radiculopathy had disc herniations, canal stenosis, and nerve root compression, whereas the individuals who simply had LBP had disc bulges more frequently. Education on life style modification should be implement for health promotion and primary prevention.

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