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Original Research Article.

Evaluation of Magnetic Resonance Imaging in Differentiating the Various Causes of Low Back Pain at a Tertiary Care Hospital

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ABSTRACT

Background: Low back pain (LBP) is one of the most common causes of physician visits with a huge socioeconomic burden. The present study was conducted to evaluate the role of magnetic resonance in differentiating the various causes of low back pain.

Materials and Methods: The present study was descriptive observational study which was carried on 140 patients with low back pain who underwent MRI of the lower spine. Baseline demographic data and clinical history was recorded. The MRI findings were analyzed. The findings were tabulated and analyzed using Statistical Package for the Social Sciences, Version 21.0 (SPSS, Chicago, IL).

Results: In the present study a total of 140 patients were included in which 58.57% were males and 41.42% were females. On MRI, degenerative changes were the commonest findings in 60% of patients followed by infective (17.14%) and neoplastic (12.14%) etiologies, inflammatory (5%) and congenital etiologies (3.57%), Arachnoid cyst was seen in 3 patients (2.14%).

Conclusion: This study concluded that low back pain was prevalent in males. The degenerative changes were the commonest cause for low back pain followed by infective and neoplastic etiologies.

Keywords: Neoplastic, Inflammatory, Degenerative, MRI.

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INTRODUCTION

Low back pain (LBP) is defined by the location of pain, typically between the lower rib margins and the buttock creases. It is commonly accompanied by pain in one or both legs, and some people with LBP have associated neurological symptoms in the lower limbs. LBP has a high prevalence, affecting up to two-thirds of adults at some point in their lifetime.[1]

Low back pain (LBP) is a common problem involving the spine and back muscles. LBP may be classified into acute (0–6 weeks), subacute (6–12 weeks), and chronic (>12 weeks) based on the duration of disease. The lifetime prevalence of LBP has been reported to be 70–85%.[2] In India, a high incidence of LBP has been found in individuals who are involved in jobs that require handling heavy loads, constant sitting/standing position or working at improper body position and prolonged working hours. In fact, the causative factors for LBP are very wide and ranges from body habits, work atmosphere, age and gender.[3]

The rationale for advanced imaging is frequently to identify rare but high-consequence conditions, such as metastases or infection. However, in the primary care population, fewer than 1% of all LBP patients have these conditions.[4] Due to the fact that the plain radiographs are insensitive for spinal pathology, magnetic resonance imaging (MRI) and computerized tomography (CT) are increasingly being utilized for low back pain, however, much of the utilization occurs outside of appropriateness guidelines.[5] Imaging findings, such as disk degeneration, facet arthropathy, and disk herniations, have been attributed as causative factors for LBP; however, these structural abnormalities are present in a large proportion of asymptomatic individuals and the incidence of these findings increases with age.[6-9]

The present study was conducted to evaluate the role of magnetic resonance in differentiating the various causes of low back pain.

MATERIALS AND METHODS

The present study was descriptive observational study which was carried on 140 patients with low back pain who underwent MRI of the lower spine. Before the commencement of the study ethical

approval was taken from the Ethical Committee of the institute and informed consent was obtained from the patients. Patients with low-back ache of non-traumatic etiology who underwent MRI of lower spine and had positive findings on MRI were included in the study. Patients with previous history of spinal surgery, Patients with previous history of spinal trauma were excluded from the study. The following sequences of the lower spine were performed: T2 weighted imaging (T2 WI) sagittal spine

1. T1 weighted imaging (T1 WI) sagittal spine
2. T1 WI axial images of relevant segments of spine
3. T2 WI axial images of relevant segments of spine
4. Coronal short τ wave inversion recovery (STIR) sequence of region of interest
5. T1 fat saturation (FS) sagittal spine
6. T1 FS axial images of relevant segments of spine.

Baseline demographic data and clinical history was recorded. The MRI findings were analyzed. The findings were tabulated and analyzed using Statistical Package for the Social Sciences, Version 21.0 (SPSS, Chicago, IL).

RESULTS

In the present study a total of 140 patients were included in which 58.57% were males and 41.42% were females. On MRI, degenerative changes were the commonest findings in 60% of patients followed by infective (17.14%) and neoplastic (12.14%) etiologies, inflammatory (5%) and congenital etiologies (3.57%), Arachnoid cyst was seen in three patients (2.14%).

Table 1: Distribution of patients based on gender

Gender	No. of patients (%)
Males	82(58.57%)
Females	58(41.42%)
Total	140(100%)

Table 2: MRI Diagnosis of various causes of Low Back Pain

MRI Diagnosis	No. of patients (%)
Degenerative changes	84(60%)
Infective	24(17.14%)
Neoplastic	17(12.14%)
Inflammatory	7(5%)
Congenital	5(3.57%)
Arachnoid cyst	3(2.14%)
Total	140(100%)

DISCUSSION

MRI is the method of choice for the evaluation of disk morphology because of the good sensitivity (60–100%) and specificity (43–97%) for disk herniations (both protrusions and extrusion).[10]

The prevalence of LBP in Indian population has been found to vary between 6.2% (in general population) to 92% (in construction workers). Low socioeconomic status and poor education have been found to be associated with LBP.[11]

In the present study a total of 140 patients were included in which 58.57% were males and 41.42% were females. On MRI, degenerative changes were the commonest findings in 60% of patients followed by infective (17.14%) and neoplastic (12.14%) etiologies, inflammatory (5%) and congenital etiologies (3.57%), Arachnoid cyst was seen in 3 patients (2.14%).

Battie MC et al., in his study found that 76% of cause for low back ache was degenerative disc disease.[12]

Uncomplicated LBP with or without radiculopathy is often a self-limiting benign condition in that does not warrant imaging studies in the first 4–6 weeks after symptom onset.[13,14] The majority of disk herniations resorb, and patients usually become asymptomatic within 8 weeks after symptom onset.[15]

MRI is considered to be highly sensitive for diagnosis of degenerative changes of spine in patients with low back pain. However, specificity of MRI is low, as degenerative changes of the spine are also seen in many asymptomatic individuals. However, current evidence suggests that disc bulges and protrusions have poor correlation to symptoms. Disc extrusions are almost always associated with symptoms and therefore may be considered as predictors of response to treatment.[16]

A prospective cohort study by Bell et al., recommends urgent unenhanced lumbar MRI in all patients with new-onset urinary symptoms with low back pain or sciatica.[17] The most common cause of CES is lumbar disc herniation at the L4-5 or L5-S1 levels, but can also occur secondary to trauma, metastatic disease or spinal hemorrhage. In patients who are unable to undergo MRI, myelography can be used as an alternative.[14]

CONCLUSION

This study concluded that low back pain was prevalent in males. The degenerative changes were the commonest cause for low back pain followed by infective and neoplastic etiologies.

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