Available online www.jocpr.com

Journal of Chemical and Pharmaceutical Research, 2017, 9(4):191-195

Research Article

ISSN : 0975-7384
CODEN(USA) : JCPRC5

MRI Finding in Acute Lower Back Pain

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ABSTRACT

Role of MRI in patients with acute lower back pain. Method: A group of 501 patients who referred unit from orthopedic were subjected to MRI examination and the MRI results were evaluated. All patients with radicular pain, neurological signs or traumatic patients were excluded from this study. Results: 501 patients complain from acute lower back pain , mean age 33.49+8.38 range (20-70), 229 (46%) male and 272 (54%) female , in combined MRI finding with age of patients , we found large number of patient have disk prolapsed (191), with mean age 36.50 , while patient with normal MRI or just muscles spasm were mean age (31.79), so the MRI not effect in outcome of young patient (below 31 years old) with a lower back pain. Conclusion: Lumbo-sacral MRI exam have minimal effect in outcome of young patient with acute lower back pain (less than 3wks)

Keywords: Acute low back pain; Magnetic resonance imaging

INTRODUCTION

Low back pain refers to spinal and paraspinal symptoms in the lumbosacral region. "Acute" typically means duration of less than 2 to 4 weeks [1]. The differential diagnosis of low back pain is broad and includes mechanical and non-mechanical causes. Acute low back pain is one of the most common conditions encountered in primary care [2]. In majority of the cases, acute back pain is self-limited and benign with no cause identified in 95% of the patients. In such patients the cause is either a muscular or ligamentous injuries [2,3]. A focused history and physical examinations is the first step to determine the specific underlying conditions and to look for evidence of neurologic involvement [4,5]. The evaluation for low back pain should include a complete, focused medical history looking for red flags, which include, but are not limited to: severe or progressive neurologic deficits (e.g., bowel or bladder function), fever, sudden back pain with spinal tenderness, trauma, and indications of a serious underlying condition (e.g., osteomyelitis, malignancy). It is also important to rule out non spinal causes of back pain, such as pyelonephritis, pancreatitis, penetrating ulcer disease or other gastrointestinal causes, and pelvic disease [6]. Although imaging is commonly used for further evaluation, it should not be considered as a replacement of clinical suspicion based on an accurate history and physical exam. It is important to keep in mind the limitations of the diagnostic studies and to consider how the management will be influenced by the information obtained from these studies [7]. Magnetic resonance imaging (MRI) is the preferred investigation for most spinal diseases and is increasingly requested for people with low back pain (LBP). However, determining the cause of back pain is complicated as it is often multifactorial and anatomical abnormalities are common in the spine and may not necessarily translate into clinical symptoms [6]. Thus, national guidelines discourage the use of MRI in non-specific LBP and recommend reserving it for the investigation of severe or progressive neurological deficits or for those cases in which serious underlying pathology is suspected. It also has an acknowledged role in planning surgical management in cases of radiculopathy and spinal stenosis. These review summaries the indications for MRI in LBP and calls for improved education of patients and health professionals in the limitations of this investigation. MRI has a high sensitivity and specificity in the detection of cancer or infection, but it is not particularly specific when evaluating lumbar radiculopathy. Poor specificity can lead to finding clinically irrelevant abnormalities. The overall evidence for the appropriate use of MRI in low back pain is limited and weak [6].

MATERIALS AND METHODS

Between July 2014 to July 2016, 501 patients with acute lower back pain were referred from orthopedic outpatient to the MRI unite at AL-Diwaniya teaching hospital. The mean age 33.49+8.38 range (20-70), 229 male and 272 female. The history was taken from every one of them, the data collected include, age, sex and duration of pain (all had pain for1 to 2 wks. only). We exclude all patients with history of trauma, patients with previous attack of back pain, patients with lumbo-sacral spine diseases and patients with neurological diseases.
The MRI exam was done by using Siemens Avanto (1.5 tesla) apparatus putting the patient on supine position, the time of examination (10 minute), an ordinary sequences was done, T1 and T2 weighted image sagittal views, T2 weighted image axial view (4mm slice thickness) and MRI myelography.
The following criteria were evaluated in MRI examination:

1. Loss of normal lumbar lardosis, for severe muscles spasm.
2. Signal intensity of disk and it is position, to diagnose disk dehydration and prolapsed.
3. Intervertebral foramina, for nerve root compression stenosis foramina.

We divided MRI findings into three groups:

A. Negative: normal LSS MRI.
B. Muscles spasm only, without disk prolapsed.
C. Disk prolapsed in all types: central, postero-lateral and lateral.

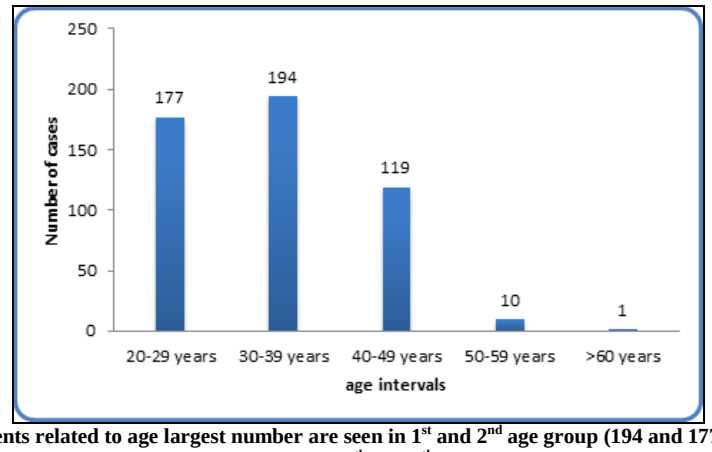
Patients divided into 5 age groups these findings applied to patients according to their age.
The total patients classified into 5 groups with interval of 10 years 1st group (20-29 y), 2nd group (30-39 y), 3rd group (40-49 y), 4th group (50-59 y) and 5th group ≥ -60 y.
We Correlated the MRI findings with patients age group, for comparison between age groups as appropriate (P < or = 0.05) was considerable statistically significant.

RESULTS

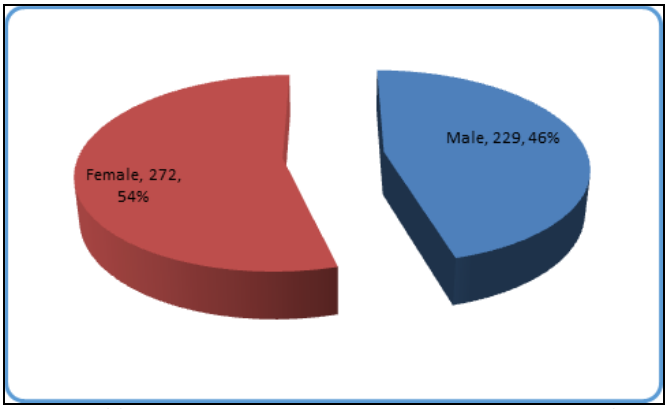
Total number of patients was 501, with mean age 33.49+8.38 range (20-70), 229 (46%) male and 272 (54%) female. We divided the patients in to 5 age groups with 10 years interval for each group, 1st group (20-29 years), 2nd group (30-39 years), 3rd group (40-49 years), 4th group (50-59 years) and 5th group (Table 1 and Graphs 1 and 2).

Table 1: The distribution of patients according to the age group was 177 (35.3%) in the 1st group, 194 (38.7%) in 2nd age group, 119 (23.8%) in 3rd age group, 10(2%) in 4th group, and small number in 5th group 1 (0.2%)

Age Group	Age intervals	Frequency	Percent
1st	20-29 years	177	35.3
2nd	30-39 years	194	38.7
3rd	40-49 years	119	23.8
4th	50-59 years	10	2
5th	≥ 60 years	1	0.2
	Total	501	100



Graph 1: Number of patients related to age largest number are seen in 1st and 2nd age group (194 and 177), then 3rd (119), while the less number are seen in 4th and 5th group (10 and 1)



Graph 2: showing number of female in this simple little more than male, 272 (54%) female, 229 (46%) male

The distribution of patients according to MRI finding was as follow (Table 2 and Graph 3):

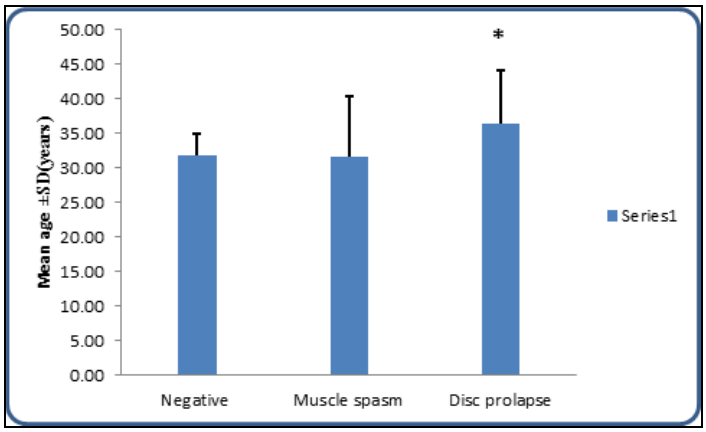
Group A: 38 patients had negative results.

Group B: 272patients had only muscle spasm.

Group C: 191 patients had disc prolapse with or without nerve root compression or spinal stenosis.

Table 2: In compared group A with B showing (P1 0.9) not significant both have same age group (mean age 31 young pat.), while comparison between group A with C we have (P2 0.001) significant that s mean these signs are seen in different age groups, and comparison between group C with B showing (P3 < 0.001) highly significant, means these signs also seen in different age groups, both groups A and B are seen in young pat, while group C are seen in old age patients (mean age 36.50)

Groups	Finding	N	Mean age ± SD	P1	P2	P3
A	Negative	38	31.79 ± 3.21	0.9	0.001	<0.001
B	Muscle spasm	272	31.61 ± 8.78			
C	Disc prolapse	191	36.50 ± 7.63			



Graph 3: Relation between the ages of pat. and MRI finding, showing negative and muscles spasm are seen in younger pat (Below 35 year old), while disc prolapsed are seen in older age about 40 years old

DISCUSSION

Prolapsed Lumbar disc is regarded as one of the most frequent vertebral column disorders of old people leading to back ache, radicular ache, and then neurological defect due to compression of nerve root [8]. Prolapsed Lumbar disc is a rare condition in children and adolescents. In available published literature, people younger than 18 years generally constitute only 0.5–3% of all patients subjected to surgical intervention [9]. A lot of studies have revised many possible risk factors for lumber disc herniation (LDH), including BMI, age, gender, diabetes, smoking, type of LDH, occupation, and others. Regarding gender, when analysis of subgroup was dependant up on different study sites, it was found that for male gender it was more possible to have recurrent LDH when they were from Asian ancestors [10]. The higher rate in male patients supports the finding of our study. Most published studies showed that low backache rate and accompanying disc prolapse is significantly rare in young patients and that the rate is more with increasing age and his observation is in accordance with the finding of the current study. For instance, Kjaer, et al. observed that about a 3rd of 439 13-year-olds subjected to MRIs for back pain had MRI abnormalities. Salminen, et al. studied 40 children patients reporting lower backache [11,12]. Kasliwal and Deutsch observed significant number of subjetcs who had chronic lower back

pain during their 20s (Figure 1); however, LDH most frequently affects patients in their early 40s [13], (Figures 2 and 3). Only 11% of young adults with low back pain experience acute disc herniation of the lumbar region [14]. Pain has usually acute onset, flexion-related and often accompanied by back muscle spasm, tightness of hamstring muscles and, sometimes, pain in buttock region [15-18]. Radicular symptoms (paresthe-sias and muscle weakness) are uncommon [19,20]. Examination frequently demonstrates reduced flexion, positive straight leg raise and sometimes less reflexes/strength of the lower limbs.

Figure 1: Sagittal MRI T2 weighted image showing normal disk signal intensity, no signs of prolapsed disk

Figure 2: Sagittal MRI t2 weighted image: acute prolapsed L5/S1 disk, with sever muscles spasm

Figure 3: Axial MRI t2 weighte3d image showing bilateral nerve root compression by L4/L5 disk prolapsed

CONCLUSION

The present study showed that Low back pain was more frequent in females in comparison to males. This is in accordance with the several previous studies, that showed that Low back pain symptoms were usually more common among females. Schneider et al. [21] and Hathorn et al. [22] showed that the rate of Low back pain is higher among females due to the stress of hormonal changes, problems related gynaecological disorders and also childbirth related events [23].

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