



ORIGINAL RESEARCH PAPER

Radiology

LUMBAR MRI FINDINGS IN SUDANESE PATIENTS WITH LOWER BACK PAIN

KEY WORDS: Lower back pain; MRI findings, Lumbar spine

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ABSTRACT
Objective: Lower back pain is a very common health problem worldwide and a major cause of disability affecting performance at work and general well-being. Also it is highly prevalent and has substantial socioeconomic implications. The aim of this study was to find out the most common MRI findings in lumbar spine of Sudanese patients with lower back pain and its relation to the patients age, gender and body mass index (BMI). **Materials and Methods:** Total 104 patients with lower back pain from both gender and aged between (11-80) years were scanned for lumbar spine MRI at (Abdoon Seed Ahmed Medical Complex, and Alzaytoona Hospital), in a period from July 2021 to March 2022 were enrolled in the study. The data were collected from medical reports using data collecting sheet and were analyzed by SPSS. **Results:** The study found that the most common MRI findings were disc bulge (67.6%), followed by loss of lordosis (48.9%), and the most affected level was L4-L5. MRI findings was not affected with patients age and gender, on other hand the lumbar disorders were significantly affected by patients BMI (P-value= 0.00). **Conclusion:** The study showed that lumbar disorder was affected with patient BMI, but there was no significant variation nor with age neither with gender.

INTRODUCTION

Lower back pain (LBP) is a widespread health problem worldwide and a major cause of disability affecting .The use of MRI as initial imaging for back pain has increased in general practice. statistical research was done in USA to determine most common radiology procedures at imaging centers in the U.S.A in 2018, by number of procedures carried out that year. The research found that During that year, around 540,633 MRIs of the lumbar spine were carried out at imaging centers in the U.S., making it the third most common radiology procedure¹. Performance at work and general well-being. Also it is highly prevalent and has substantial socioeconomic implications. It is estimated that 70-80% of adults experience low backache at some time during their lives^{2,3}.

Magnetic resonance imaging (MRI) of the spine is a powerful tool for evaluation, assessment of severity, and follows up of diseases of the spine. It is one of the most sensitive diagnostic tests for detecting anatomic abnormalities of the spine and the adjacent structures⁴. MRI has opened up new possibilities for refined diagnostic classification of mechanical LBP in epidemiological research. Various abnormalities can be identified on spinal MRI, including disc herniation, nerve root impingement, disc degeneration and high intensity zone/annular tear⁵.

But evidence now indicates that imaging is useful only in the small subgroup of patients for whom there is suspicion of red flag conditions. These conditions include cancer, infection, inflammatory disease, fracture, and severe neurological deficits—which together account for only 5-10% of LBP presentations in primary care⁶.

For the remaining 90-95% of LBP cases (called non-specific or uncomplicated LBP), imaging will not guide management and can cause more harm than benefit. International guidelines⁷.

But the MRI scan is very expensive and the International guidelines recommend the use of imaging only when there is suspicion of serious pathology (fracture, malignancy and discitis), or in patients with severe sciatica for whom surgery

is indicated because they fail to respond to conservative care for at least 6–8 weeks^{8,9}. Furthermore, prior studies have demonstrated that imaging findings of spinal degeneration associated with back pain are present in a large proportion of both symptomatic and asymptomatic individuals, thus limiting the diagnostic value of these findings¹⁰⁻¹²

With this highly usage of lumbar MRI scan we need to highlight the pathological findings and if really there are needed to make MRI for any patient with lower back pain. The aim of this study to find out the most common MRI findings in lumbar MRI scan of Sudanese patients.

MATERIAL AND METHODS

104 MRI Reports of lumbar spine for patients with LBP were enrolled in this retrospective cross-sectional study, (48) patients were female and the rest (56) patients were male, their age range between 11 to 80 years. The study was conducted from July 2021 to March 2022. The data were taken from the medical reports, which were written by expert consultant radiologist. The data was collected using data collecting sheet which was specifically designed for the study, the variables include age, gender, BMI, occupation and MRI findings. Body mass index was calculated by dividing weight in kilograms by height in meters squared. Ethical approval was obtained from the Ethical Committee board of the Private Medical Centers.

MRI examinations for lumbar spine were done using MRI machines Toshiba, Siemens, and Philips with strength range from 0.2-1.5 tesla. MRI sequences for all patients were Sagittal/coronal SE/FSE T1 or coherent GRE T2*, Sagittal SE/FSE T2 or coherent GRE T2*, Axial/oblique and SE/FSE T1/T2 or coherent GRE. The images were interpreted by certified radiologists. The data were analyzed using static package for social science (SPSS). The frequency of each variable was assessed and significance between LBP and each variable was assessed, P value < 0.05 regarded as significant correlation.

RESULTS

In this study (n=104) patients were included, from which (56)

patients were male and the rest (48) patients were female, their age range from (11-80 years), the patients grouped in to five age group as in (Table 1). According to the body mass index (BMI) calculator most of the patients in this study were classified as overweight and obese (Table 2).

TABLE - 1: DISTRIBUTION OF THE STUDY SAMPLE ACCORDING TO THE GENDER, AGE GROUPS AND BMI

Demographic variable	Frequency	Percent
Gender		
Male	56	53.8%
Female	48	46.2%
Age groups		
(11-25)	12	11.5%
(26-40)	24	23.1%
(41-55)	32	30.8%
(56-70)	29	27.9%
more than 70	7	6.7%
BMI		
Under weight	1	1%
Healthy	35	33.6%
Over weight	34	32.7%
Obese	34	32.7%

The most frequent finding was disc bulge, which were present in 67.6% of patients, followed by loss of lordosis 48.9% and a disc herniation in 17.7% (Table 3).

TABLE - 2: NUMBER OF INCIDENCES

MRI findings	Frequency	Percent
Disc bulge	65	67.6%
Loss of lordosis	47	48.9%
Loss of height	4	4.2%
Disc herniation	17	17.7%
Fracture [fx]	6	6.2%
Dehydration	4	4.2%
Excessive lumbar lordosis	2	2.1%
Muscle spasm	1	1.04%
Pott's disease	4	4.2%
Soft tissue lesion	1	1.04%

Although the male was affected more frequently than female, but there was no significant correlation between the incidences and gender (Table 4).

TABLE - 3: CORRELATION OF MRI FINDINGS WITH GENDER

		Gender		Total
		Male	Female	
MRI	Disc bulge	33	32	65
	Loss of lordosis	33	13	46
	Loss of height	4	3	7
	Disc herniation	6	9	15
	Fracture [fx]	4	2	6
	Dehydration	3	1	4
	Excessive lumbar lordosis	1	1	2
	Muscle spasm	1	0	1
	Pott's disease	2	1	3
	Soft tissue lesion	1	0	1

P-value = 0.11

The most affected age groups were (41-55 and 56-70) but also there was no significant correlation between the MRI Finding and age p-value = 0.62

Significant statistical correlation was found between lower back pain and BMI p-value = 0.00

TABLE - 4: SHOWS THE MOST AFFECTED DISC LEVELS IN MRI

Disc	Frequency	Findings		
		Bulge	Herniation	Dehydration
L1 - L2	0	0	0	0
L2 - L3	0	0	0	0
L3 - L4	23	18	4	1
L4 - L5	51	39	10	2
L5 - S1	10	8	1	1

DISCUSSION

The role of lumbar spine MRI for evaluation of Lower back pain has been described in many literatures, it can assessed the disc to see if they are budging, ruptured, or pressing on the spinal cord, association between Incidence of these findings and the patient age, sex, BMI, and occupation has been detected. In this study disc bulge was the most common findings it was detected in 67.6% and it is most prominent in age group (41-55) with no significant predominance between male and female, this finding was consisted with the study of (Brinjikji W. et al., 2015)¹³ who found that disc bulge was a higher prevalence in symptomatic individual with LBP 50 years of age or younger .And it's also match the result of Evelien et al, 2016 study. This result made the serious pathology represent just 7.2% of all finding¹⁴ .As the same time the results found disc bulge was common at L3-L4, and L4-L5 which is in agreement with finding of (Pokhraj S et al., 2015). Also the result found that most of patient show loss of lumbar lordosis 48.9% which is also concordance with the study of (Pokhraj S et al., 2015)¹⁵. On the other hand there was significant relation between BMI and the incidence of lumbar diseases which have been consisted with a prior study of (Binwu Sh., et al 2017)¹⁶ who find that overweight and obese respondents were more likely to develop lower back problems. Regarding patient's occupation most of them were policeman (26%) and freelance (26%) then housewife (23%), there was a difference on comparing this finding with the study of (Hamid R et al., 2012)¹⁴ who found that housewife contribute the higher percentage (42.5%) in their study.

CONCLUSIONS

The study showed that the common MRI findings in Sudanese are the disc bulge and loss of lordosis. Also the L4\ L5 is the most affected disc level in lumbar spine. The study reveals that the MRI findings had no significant relation nor with age neither with gender. On other hand there is significant correlation between BMI and lumbar disorders.

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