The Role of Lumbosacral Spine MRI in Evaluation of The Low Backache of Patients in Mosul City

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ABSTRACT

Background: Low back pain is one of the most common presentation encountered by physicians. Reaching a correct diagnosis and reducing patient's pain is priority. The yield of routine lumbosacral MRI in patients presented with isolated low back pain (LBP) is still vague. Most patients with LBP will show different degenerative changes on MRI. As it is unclear whether surgical treatment of degenerative MRI changes results in reduction of back pain or not, the constraint of doing a diagnostic lumbosacral MRI stays questionable.

Aim: The objective of this study is to assess the causes of the lower back pain with more analysis of gender and age groups distribution.

Methods: We reviewed medical records of all patients presented with LBP and referred by their physicians for lumbosacral spine MRI in Radiation Institute in Mosul city as part of their clinical management. The study period was from March 2024 to February 2025. Only patients with a chief complaint of isolated LBP were included. We obtained the relevant data from the computerized medical files and detailed radiological findings from their MRI reports.

Results: three hundred and six patients (306) matched the inclusion criteria. We reported positive findings in MRI in 283 patients (92.5 %), only 23 patients (7.5 %) had normal MRI findings. Bulge of the intervertebral disc was the most common finding seen in (87.6 %). Positive MRI findings were most evident in the middle-age group (40-60 years old). Among the evaluated conditions, dehydration of the intervertebral disc showed a significant association with gender, with a higher prevalence in females (P = 0.015).

Conclusion: Mosul Iraqi patients presented with LBP have similar worldwide patterns of lumbar degenerative changes. Providing that only 7.5 % of patients with CLBP have normal MRI findings, suggestive that we have a relatively good referral protocol for imaging the truly indicated patients which save the cost effectiveness for the healthcare system and shorten the time on waiting list.

Keywords: low back pain, degenerative changes, MRI findings.

دور التصوير بالرنين المغناطيسي للعمود الفقري القطني العجزي في تقييم آلام الظهر المنخفضة لدى المرضى في مدينة الموصل

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الخلاصة

الخلفية: آلام أسفل الظهر هي واحدة من الأعراض الأكثر شيوعا التي يواجهها الأطباء. إن الوصول إلى التشخيص الصحيح وتقليل آلام المريض هو الأولوية. العائد من التصوير بالرنين المغناطيسي القطني العجزي الروتيني في المرضى الذين يعانون من آلام أسفل الظهر المعزولة (LBP) لا يزال غامضا. سيظهر معظم المرضى الذين يعانون من LBP تغيرات تنكسية مختلفة على التصوير بالرنين المغناطيسي. نظرًا لأنه من غير الواضح ما إذا كان العلاج الجراحي لتغيرات التصوير بالرنين المغناطيسي التنكسية يؤدي إلى تقليل آلام الظهر أم لا، فإن قيود إجراء التصوير بالرنين المغناطيسي القطني العجزي التشخيصي تظل محل شك.

الهدف: الهدف من هذه الدراسة هو تقييم أسباب آلام أسفل الظهر مع مزيد من التحليل لتوزيع الجنس والفئات العمرية.
الطرق: قمنا بمراجعة السجلات الطبية لجميع المرضى الذين قدموا مع LBP وأحالهم أطبائهم لإجراء التصوير بالرنين المغناطيسي للعمود الفقري القطني العجزي في معهد الإشعة في مدينة الموصل كجزء من إدارتهم السريرية. كانت فترة الدراسة من مارس ٢٠٢٤ إلى فبراير ٢٠٢٥. تم تضمين فقط المرضى الذين يعانون من شكوى رئيسية من LBP المعزولة. لقد حصلنا على البيانات ذات الصلة من الملفات الطبية المحوسبة والنتائج الإشعاعية التفصيلية من تقارير التصوير بالرنين المغناطيسي.
النتائج: ثلاثمائة وستة مرضى (٣٠٦) مطابقة لمعايير الاشتمال. أبلغنا عن نتائج إيجابية في التصوير بالرنين المغناطيسي في ٢٨٣ مريضا (٩٢.٥٪)، وكان ٢٣ مريضا فقط (٧.٥٪) نتائج التصوير بالرنين المغناطيسي طبيعية. كان انتفاخ القرص الفقري هو النتيجة الأكثر شيوعاً في (٨٧.٦%). وكانت نتائج التصوير بالرنين المغناطيسي الإيجابية أكثر وضوحا في الفئة المتوسطة العمر (٤٠-٦٠ سنة). من بين الحالات التي تم تقييمها، أظهر جفاف القرص الفقري ارتباطًا كبيرًا بالجنس، مع انتشار أعلى عند الإناث (P = 0.015).
الخاتمة: المرضى العراقيون في الموصل الذين يعانون من LBP لديهم أنماط عالمية مماثلة من التغيرات التنكسية القطنية. شريطة أن ٧.٥٪ فقط من المرضى الذين يعانون من CLBP لديهم نتائج تصوير بالرنين المغناطيسي طبيعية، مما يوحي بأن لدينا بروتوكول إحالة جيد نسبيًا لتصوير المرضى المشار إليهم حقًا مما يوفر فعالية التكلفة لنظام الرعاية الصحية ويقلل الوقت في قائمة الانتظار.

الكلمات المفتاحية: آلام أسفل الظهر، التغيرات التنكسية، نتائج التصوير بالرنين المغناطيسي.

INTRODUCTION

Low back pain (LBP) is considered 2nd most common complaint faced by physicians contributing to a huge socioeconomic load. [1,2] about 67% to 84% of the population at some point in their lives are affected by LBP. [3,4] However; most of the patients did not get a definite clinical diagnosis. [5,6] In those with LBP, the judgment of medical versus surgical management is difficult, due to the outcome of conservative therapy in patients with LBP seems to be nearly the same as that of surgery [7-12], thus treating these patients can be of difficulty for the physicians and so to diagnose and therapy direction; imaging is commonly done.

Uncomplicated acute LBP does not need any imaging as it's a self-limiting status. [13] and most of the patients will return to their usual lives within 30 days. [14-16] Chronic LBP is defined as low back pain that persists for more than 3 months and does not have well-defined causes such as fracture, infection, deformity, or neoplasm. [17]

Degenerative disc disease is a general name used to express age-associated anatomical alterations including the facet joints and intervertebral discs; and of both acute and chronic LBP; which is considered the commonest cause. CT scans and MRIs have a high cost as a main disadvantage when compared to plain radiographs, however; their high spatial resolution and contrast and lack of ionizing radiation. The MRI is gold typical investigation for the diagnosis of spine degenerative changes and diseases. [18] It provides excellent soft tissue contrast images and details about the intervertebral discs including the hydration and shape, and the size of the spinal canal [19].

We aimed in this study to use lumbosacral MRI imaging to assess the causes of LBP with more analysis of gender and age group distribution.

MATERIALS AND METHOD

A cross-sectional study was conducted over 11 months (March 2024 – February 2025) at the Radiation Institute in Mosul City. The study involved 306 patients suffering from back pain as a chief complaint and were referred to the lumbosacral spine as a part of management, their medical records were reviewed. Informed consent was obtained from all patients before the imaging study.

All patients aged between 20 to 75 years, who complained of LBP and were referred to the Radiology Institute for an MRI of the lumbosacral spine, were included.

Patients aged less than 20 or above 75 years, or those with a previous history of low back surgery or a known rheumatological or spinal disorders including metastasis were excluded from the study.

The patients with known contraindications to MRI imaging as pacemaker, cochlear implant, claustrophobia, early pregnancy & metallic subjects were excluded as well.

The collected clinical data included the age, gender, site of the back pain, any pain referred to the lower limb, and any numbness in the lower limbs with the laterality. (which side).

MRI Examination

No specific preparation was needed, Native Lumbosacral spine MRI was done using a 3T Philips MRI imaging system. The sequences used were: sagittal T2, T1, and STIR, axial T2, and myelography.

See figure (1). Two Specialist diagnostic radiologists with more than 10 years of experience read the exam they were blind to the presenting symptoms and clinical data.

The findings were categorized into the following types:

a. Normal.
b. Disc dehydration
c. Degenerative disc disease Level of the affected discs. : diffuse bulge, herniation, extrusion.
d. Modic changes.
e. Canal stenosis.
f. Nerve compression
g. Ligamentum flavum hypertrophy.
h. Spondylolisthesis.
i. Infection. Including spondylodiskitis.

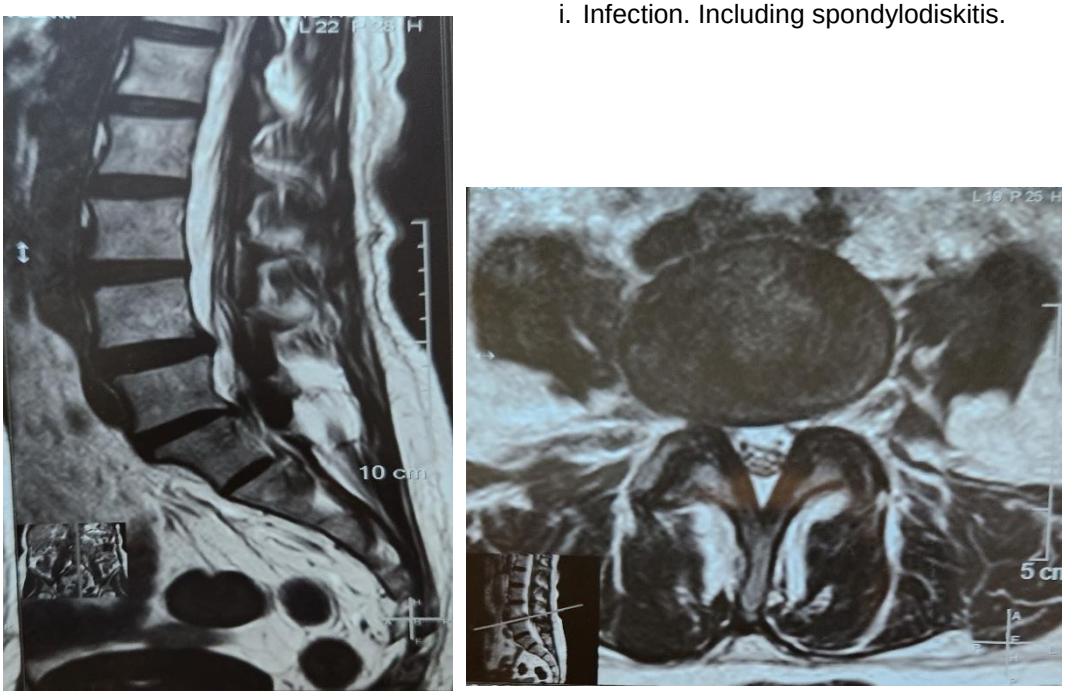

Figure 1: MRI of lumbosacral spine .A. T2 sagittal section, B. T2 axial section at L4-5 disc space. Both show diffuse disc bulge indenting the thecal sac & right lateral nerve recess compression.

Statistical Analysis

The data were initially recorded in Microsoft Excel and subsequently analyzed using SPSS (Statistical Package for the Social Sciences), version 25. Continuous variables, such as age, were expressed as mean, range, and standard deviation, while categorical variables were summarized as frequencies and percentages.

Independent T-tests were conducted for comparison between two quantitive variables. A one-way ANOVA test was used to compare the mean age across three independent groups and Tukey's HSD test was used for post hoc comparisons. The Chi-square test was used to evaluate associations between gender and various disc pathologies, such as Modic changes, stenosis, and ligamentum flavum hypertrophy. Statistical significance was determined using a p-value threshold of less than 0.05.

RESULTS

The study included 306 patients suffering from back pain, comprising 181 females (59.15%) and 125 males (40.85%). Participants ranged in age from 17 to 80 years, with an average age of 44.4 years (standard deviation: 13.22 years).

The distribution of affected spinal levels is detailed in Table 1. The most common patterns of involvement were L3-L4, L4-L5, L5-S1 (31.4%) and L4-L5, L5-S1 (29.7%), together accounting for 61.1% of cases. Single-level involvement, such as L4 -L5 (11.8%) or L5-S1 (5.9%), was less frequent, while complex combinations like L2-L3, L3-L4, L4-L5 (1.6%) and L1-L2, L4-L5(0.3%) were rare. Notably, the cumulative percentages indicate that the majority of patients (91.2%) experienced involvement across multiple levels, particularly L4, L5, or more.

Table 1: Distribution of Levels of Involvement in the Study Population.

Level of Disc	**Frequency**	**Percent %**
L3-L4, L4-L5, L5-S1	96	31.4
L4-L5, L5-S1	91	29.7
L4-L5	36	11.8
L3-L4, L4-L5	21	6.9
L5-S1	18	5.9
Normal	23	7.5
L2-L3, L3-L4, L4-L5, L5-S1	8	2.6
L2-L3, L3-L4, L4-L5	5	1.6
L2-L3, L4-L5	2	0.7
L2-L3, L4-L5, L5-S1	2	0.7
L1-L2	1	0.3
L1-L2, L2-L3, L3-L4, L4-L5, L5-S1.	1	0.3
L1-L2, L4-L5	1	0.3
L3-L4	1	0.3
Total	306	100

When evaluating each lumbar disc individually, the L4-L5 level emerged as the most frequently affected spinal segment, with pathology observed in 85.9% of cases, followed by the L5-S1 level at 70.3%. The L3-L4 level showed involvement in 43.1% of cases, whereas the L1-L2 level was the least affected, with only 5.9% of cases exhibiting pathology. In terms of the extent of disc pathology, two-level involvement was the most common (37.%), followed by more than two levels (36.6%) and single-level pathology (18.3%). Disc dehydration was present in 61.8% of cases, while disc bulge was noted in 87.6%. Herniation was relatively less frequent, affecting 12.4% of cases, and disc protrusion was rare, observed in only 4.6%. These findings underscore the high prevalence of multi-level disc pathology, particularly at the L4-L5 and L5-S1 levels, which may reflect the biomechanical stress concentrated in these regions (see Table 2).

Furthermore, the study revealed that most cases (88.2%) showed no evidence of spinal canal stenosis, while 10.8% tested positive for the condition. Compression was a notable finding, with bilateral compression observed in 59.2% of cases, unilateral compression in 16.7%, and no compression in 24.2%. Ligamentum flavum hypertrophy was identified in 12.4% of cases, while the majority (87.6%) showed no evidence of this condition. Similarly, spondylolisthesis was uncommon, present in only 5.6% of cases. Regarding Modic changes, more than half of the cases (56.2%) exhibited no degenerative changes (Modic 0), while 28.4% showed Type 1 changes, and 15.4% displayed Type 2 changes. These results suggest that while degenerative changes and ligamentum hypertrophy were relatively infrequent, compression, particularly bilateral, was a significant finding, highlighting its potential role in spinal pathologies. The variability in the prevalence of these factors emphasizes the need for further research to explore their clinical significance (see Table 2).

Table 2: Frequency and Percentage Distribution of Spinal Pathologies and Levels of Involvement.

Variable	Category	Frequency	Percent%
L1-L2	Yes	18	5.9
	No	288	94.1
L3-L4	Yes	132	43.1
	No	174	56.9
L4-L5	Yes	263	85.9
	No	43	14.1
L5-S1	Yes	215	70.3
	No	91	29.7
Pathology disc Level	Normal	23	7.5
	Single Level disc pathology	56	18.3
	Two Levels disc pathology	115	36.6
	More Than Two Levels Disc Pathology	112	36.6
Dehydration	No	117	38.2
	Yes	189	61.8
Bulge	No	38	12.4
	Yes	268	87.6
Herniation	No	268	87.6
	Yes	38	12.4
Protrusion	No	292	95.4
	Yes	14	4.6
Spinal canal stenosis	No stenosis	270	88.2
	Single level	33	10.8
	Multiple levels	3	1
Compression	No	74	24.2
	Unilateral	51	16.7
	Bilateral	181	59.2
Ligamentum Flavum	No	268	87.6
	Yes	38	12.4
Spondylolisthesis	No	289	94.4
	Yes	17	5.6
Modic Changes	Normal	172	56.2
	Modic type 1	87	28.4
	Modic Type 2	47	15.4

Age Differences and the Extent of Disc Bulges:

A one-way ANOVA revealed significant age differences among individuals with single-level, two-level, and more-than-two-level disc bulges ($F(2, 303) = 28.338$, $p < 0.001$). Post hoc analysis showed that individuals with more-than-two-level bulges were significantly older than those with single-level bulges (mean difference = 12.83, $p < 0.001$) and two-level bulges (mean difference = 9.73, $p < 0.001$). However, no considerable age difference was seen between the single-level and two-level groups (mean difference = -3.10, $p = 0.109$). These findings highlight a positive association between age and extent of disc pathology.

Age Association with Disc Dehydration, Bulge, Herniation, and Protrusion.

The analysis revealed significant differences in the mean age across various conditions. For **dehydration**, individuals without disc dehydration had a significantly lower mean age (33.58 years) compared to those with disc dehydration (51.12 years, $p < 0.001$). Similarly, for disc **bulge**, the mean age of individuals without a disc bulge was significantly lower (35.74 years) than those with a disc bulge (45.65 years, $p < 0.001$). However, no significant differences in mean age were observed for disc **herniation** (mean age: 44.66 years for no herniation vs. 42.68 years for herniation, $p = 0.398$) or disc **protrusion** (mean age: 44.79 years for no protrusion vs. 36.57 years for protrusion, $p = 0.230$). These findings mean a significant association between age and the presence of dehydration and bulge, whereas herniation and protrusion did not show a statistically significant relationship with age, see Table 3.

Table 3: Effect of Age on Discs' Dehydration, Bulge, Herniation, and Protrusion

Variable	Category	N	Mean age	P-value*
Dehydration	No	117	33.5812	0.000
	Yes	189	51.1217	
Bulge	No	38	35.7368	0.000
	Yes	268	45.6455	
Herniation	No	268	44.6604	0.398
	Yes	38	42.6842	
Protrusion	No	292	44.7911	0.23
	Yes	14	36.5714	

*Independent sample T-test was applied.

Age Variations Across Spinal Pathologies (Modic Changes, Cord Compression, Canal Stenosis, and Ligamentum Flavum Hypertrophy).

Modic changes are strongly associated with increasing age ($p < 0.001$). Individuals with Modic type 2 changes had the highest mean age (59.66 years), significantly higher than both type 1 and no Modic changes. This suggests a possible progression or age-related association of Modic changes.

In terms of compression, bilateral compression is also significantly associated with higher age, $p < 0.001$), with a mean of 48.75 years, compared to no unilateral compression. However, there was no significant difference between the no compression and unilateral compression groups ($p = 0.091$).

These findings suggest that both Modic changes and spinal compression are associated with increasing age, especially in the more advanced or severe types, see Table 4.

Table 4: Comparison of mean age by modic changes, type, and compression type.

Variables		Items			P value*
Modic type	Groups	No	Type 1	Type 2	---
	No.	172	87	47	
	Mean ± SD (years)	36.5 ± 9.99 C	51.78 ± 7.91 B	59.66 ± 9.88 A	**0.001**
Compression type	Groups	No	Unilateral	Bilateral	---
	No.	74	51	181	
	Mean ± SD (years)	36.26 ± 11.78 B	40.88 ± 12.67 B	48.75 ± 12.06 A	**0.001**

* One-way ANOVA test with Tukey's Pairwise comparisons was applied. Means that do not share a letter are significantly different.

There was **no statistically significant difference** in age between those with and without **spinal stenosis** ($p = 0.619$).In contrast, participants with **ligamentum flavum hypertrophy** were significantly older than those without it (**mean difference = 14.61 years, $p < 0.001$**), suggesting a strong age-related association with this condition, see Table 5.

Table 5: Comparison of Mean Age by Spinal Stenosis and Ligamentum Flavum Hypertrophy

Variable	Group	N	Mean Age	Std. Deviation	p-value**
Spinal Stenosis	Yes	33	56.27	9.91	0.619
	No	3	53.33	5.77	
Ligamentum Flavum Hypertrophy	Yes	38	57.21	9.48	< 0.001*
	No	268	42.60	12.67	

** Independent samples t-tests were used.

Gender Association with various disc pathology, canal stenosis, nerve compression, and spondylolisthesis

The analysis of gender association with various disc pathologies revealed notable differences. Among the evaluated conditions, dehydration of the intervertebral disc showed a significant association with gender, with a higher prevalence in females (P = 0.015). Similarly, stenosis involving two levels demonstrated a significant gender difference, also more frequent in females (P = 0.039). Ligamentum flavum hypertrophy was significantly associated with gender, with higher cases observed in females (P = 0.003). Other pathologies, including bulge, herniation, protrusion, Modic changes, compression, and spondylolisthesis, did not show statistically significant gender differences (P > 0.05). These findings suggest that certain disc pathologies may have a gender predisposition, warranting further investigation see Table 6.

Table 6: Gender Association with Various Disc Pathologies

Pathology	Gender		
	Male	Female(n)	P-value*
Normal	10(43.4%)	13(56.5%)	0.79
Dehydration	67(35.4%)	122(64.5%)	0.015
Bulge	108(40.2%)	160(59.7%)	0.602
Herniation	15(39.4%)	23(60.5%)	0.854
Protrusion	8(57.1%)	6(42.8%)	0.204
Modic2levels	47(35.0%)	87(64.9%)	0.07
stenosis2levels	9(25.0%)	27(75.0%)	0.039
compreession2levels	88(37.9%)	144(62.0%)	0.066
Ligamentum flavum	7(18.4%)	31(81.5%)	0.003
Spondylolisthesis	5(29.4%)	12(70.5%)	0.324
Total	125(40.8%)	181(59.1%)	

*Chi-square tests were used to assess the association between gender and various disc pathologies.

Age and Gender Distribution of Disc Pathologies

The distribution of disc pathologies across different age groups and genders reveals several trends. The most prevalent findings include disc bulge (268 cases) and disc dehydration (189 cases), with higher frequencies observed in the 40-60 age group for both genders. Compression was also common, totaling 232 cases, primarily in individuals aged 40-60 and above. Modic changes were recorded in 134 cases, predominantly in females aged 40-60 and above 60 years.

Less frequent conditions include spondylolisthesis (17 cases) and protrusion (14 cases), which were primarily observed in the older age groups. Ligamentum flavum hypertrophy showed a total of 38 cases, with females being more affected, especially those aged 40-60 and above 60 years. Canal Stenosis was recorded in 36 cases, with the majority being females in the older age groups. Herniation affected 38 individuals, most commonly in the 40-60 age group for both genders.

Overall, the data indicate that age and gender significantly influence the prevalence of various disc pathologies, with a notable increase in degenerative changes among females and individuals over the age of 40. see table 7.

Table 7: Age and Gender Distribution of Disc Pathologies

Findings	Age Groups in Years/ Males				Age Groups in Years/ Females				Total
	< 20	20-40	40-60	> 60	< 20	20-40	40-60	> 60	
Normal	1	6	3	0	0	8	4	1	23
Dehydration	0	11	46	10	0	18	84	20	189
Bulge	3	44	51	10	1	47	92	20	268
Herniation	0	6	8	1	1	8	14	0	38
Protrusion	0	6	2	0	0	4	2	0	14
Modic Changes	0	1	36	10	0	5	62	20	134
Spinal canal stenosis	0	1	5	3	0	0	20	7	36
compreession 2levels	1	35	42	10	1	38	85	20	232
Ligamentum flavum hypertrophy	0	0	5	2	0	1	20	10	38
Spondylolisthesis	0	0	3	2	0	2	8	2	17

DISCUSSION

There is agreement among most neurological physicians that LBP is fundamentally a mobility-related condition, a matter that is related & worsened by psychological & social factors. Although marked agreement about the etiology remains little. [20-22]

Thus seeking the pathology that could demonstrate the nature and assist management of LBP is the essential goal for researchers in such a range.

Lumbosacral MRI is believed as a worthy device for stating degenerative changes of the spine, with questionable importance regarding management. [23] Despite MRI has multiple characteristics, it holds some restrictions; such as relatively high cost, [24] patient's poor bearing, in addition to relatively long waiting time for appointments.

In our institution, for elective appointments, the average time is about 2 months. Routinely, lumbosacral MRI is done for those with obstinate LBP to reach the likely causes & eliminate the others. Worried patients who looking for reassurance are one of the biggest problems in our practice for MRI requesting, which will lead to over-investigation and eventually elongated waiting time. In our study, normal findings in 23 patients (7.5%) who presented with LBP, in comparison to Kanaan et al [25] in which normal findings in approximately one-third of the sample (32.93%). This, means we have a relatively good referral protocol for imaging the truly indicated patients which saves the cost-effectiveness for the system of healthcare and lowers the time on the waiting list.

In the present study, there is a high prevalence of L4-L5 and L5-S1 involvement, collectively accounting for the majority of cases (61.1%). There is the rarity of single-level pathology and complex combinations, noting the significant role of multi-level involvement.

Many researchers studied the prevalence of MRI changes through the different age groups. Cheung et al showed that the prevalence of lumber disc degeneration in Chinese people was 40% for those under the age of 30 and over 90% for ages 50 to 55. [26] Furthermore, Al-Saeed et al showed disc dehydration followed by disc bulge were the commonest MRI findings in the symptomatic young Arabs. [27] Also, Kanaan et al said that degenerative disc changes (dehydration, bulge, protrusion) were the commonest covering about (60%) of all findings, and at most occurring in the middle-age group, as this age group constitutes a high percentage of their sample [25].

Study results, In comparison with the mentioned studies, showed findings indicate a significant association between age and the presence of dehydration and bulge with findings of 9.4% & 31% below the age of 40 respectively & 52% & 56% above the age of 40 yrs, whereas herniation and protrusion did not show a statistically significant relationship with age.

Accordingly, we can say that Iraqi people follow the general worldwide pattern of degenerative lumbar spine changes.

A systematic review was conducted by Meucci et al to investigate the prevalence of CLBP according to age and sex.

They concluded that CLBP is more prevalent in the age group (20–59 years) and more common in females. [28] Kanaan et al reported that LBP is more common in male patients in the overall studied group. Also, positive MRI findings are more prevalent in male patients. In addition, they found that disc protrusion is significantly more common in males (P=0.012). [25]

In this study, we tested gender variation in patients presented with isolated LBP and found that nearly all positive findings are more prevalent in female patients, with disc dehydration, spinal stenosis & ligamentous flavum hypertrophy are the most significantly statically related, These findings suggest that certain disc pathologies may have a gender predisposition, warranting further investigation.

This study supplies worthy information regarding the degenerative changes of the lumbar spine among the Mosul Iraqi people. Based on the results of the study, we encourage the management of those with LBP according to a specific protocol that conserves the cost and maintains the resources of the healthcare system, especially in low-mid income cultures. Such protocol must involve a thorough history and physical examination, starting with non-pharmacological modalities, imaging those patients who have LBP with red flags, in addition to activation of a multidisciplinary team for their concern. The multidisciplinary team must involve a physical therapist, a pain therapy specialist, a psychiatrist, and orthopedic/neurosurgery specialists.

In addition, our findings can guide diagnostic and therapeutic approaches, particularly in older populations with multi-level pathology.

The study limitations include the retrospective design type and lack of longitudinal data. We suggest future research directions, including further statistical methods, and longitudinal studies to explore causality.

CONCLUSION

The MRI findings of Lumbar degenerative changes among Mosul Iraqi patients presented with LBP follow the worldwide pattern. In our study, MRI is negative in 23 patients (7.5%) who were presented with CLBP. Thus, we have a relatively good referral protocol for MRI imaging the truly indicated patients which saves the cost for the healthcare system and reduces the time on the waiting list. Lumbar spine degenerative changes should be compatible with the clinical picture of the patients and not be the basis of surgical intervention.

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