

Evaluation of Magnetic Resonance Imaging Findings in Adult Patients with Nontraumatic Low Back Pain in South-South Nigeria

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ABSTRACT

Background: Low back pain (LBP) is a common debilitating disease affecting productivity worldwide. The excellent soft-tissue contrast, noninvasiveness, the absence of bone artifact and ionizing radiation has made magnetic resonance imaging (MRI) the gold standard for evaluating etiology of LBP. **Aim:** This study is to determine the frequency and pattern of occurrence of MRI findings in patients presenting with LBP as well as correlating it with sociodemographic factors and body mass index (BMI). **Materials and Methods:** A prospective study of 120 patients who had MRI of the lumbar spine was performed during a 12-month period in University of Port Harcourt Teaching Hospital, Port Harcourt, Nigeria. Data recorded included: Sociodemographics, anthropometry, duration of pain, and MRI findings. Statistical analysis was performed with Statistical Package for Social Sciences (SPSS) Version 20. Pearson Chi-square test was used to compare age, sex, occupation, BMI with MRI findings. $P < 0.05$ was considered significant. **Results:** The age distribution of patients was from 18 to 80 years; mean age was 51.0 ± 13.2 years. Males were 66 (55%) and females 54 (45%). LBP was chronic in 98 (82%), and professionals had the highest frequency - 49 (40%). Intervertebral disc degeneration was the most common MRI finding and correlated significantly with age ($r = 0.342$, $P = 0.002$) and BMI ($r = 0.433$, $P = 0.001$) of patients. **Conclusion:** Intervertebral disc degeneration is a common cause of LBP in our environment. There is a significant association between its presence, extent and severity with the BMI and age of the patients.

Key words: Low back pain; magnetic resonance imaging; nontraumatic

Introduction

Low back pain (LBP) is a common musculoskeletal disorder, and its pain is limited to the region between the lower margins of the twelfth rib and gluteal folds.^[1] The spectrum of clinical conditions it represents, relate to the problems of the lumbar spine, the discs, ligaments, spinal cord and nerves, muscles of the lower back and surrounding structures.^[1,2]

LBP is classified based on the duration of symptoms as acute, subacute and chronic or based on the etiology

as mechanical or nonspecific. Acute LBP is short-term lasting for a few days to 4 weeks; subacute pain lasts from 4 to 12 weeks while chronic LBP is pain that persists for 12 weeks.^[2]

The incidence of LBP is such that over 80% of people complain of LBP in their life time.^[2,3] Non-specific LBP is the most common cause of LBP and is mostly due to a sprain in the soft-tissues and muscles of the back.^[2]

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Plain radiographs in the evaluation of patients who have LBP symptoms rule out infection, malignant lesion, fracture and inflammatory condition. Plain radiographs alone however cannot conclusively assess the soft tissues of the spine.^[3] Thus, with the aim to improve the diagnosis, understand the pathophysiology and assist in alleviating patient's pain and discomfort modern neuroimaging techniques have been developed.^[4]

The gold standard and preferred imaging modality for evaluating the most spinal lesions is magnetic resonance imaging (MRI),^[4] due to its high soft-tissue resolution, noninvasiveness, multiaxial and multiplanar imaging capabilities. It allows the elucidation of the morphology of the spinal structures and has an acknowledged role in planning surgical management,^[4-6] hence its need in evaluating the findings of the lumbosacral spine in patients with LBP.

Materials and Methods

Study site

This study was conducted in the Radiology Department of University of Port Harcourt Teaching Hospital (UPTH) in Nigeria over a period of 12 months. Ethical approval was obtained from Hospital Ethical Committee before commencement of the study.

Study design

A cross-sectional prospective, and descriptive study of patients referred to the Department of Radiology for MRI scan with a clinical history of LBP. Patients of either gender over 18 years of age were included in the study while patients with a history of trauma and contraindications to MRI were excluded from the study. The consent was obtained with a signed form and confidentiality was maintained. Demographic data such as age, sex, weight, height, occupation, and duration of pain was obtained using a structured interview form.

Occupation was classified based on the United Kingdom Registrar General's classification of occupation.^[7]

- I. Professional occupations, e.g., doctors and lawyers
- II. Managerial and lower professional occupations, e.g. managers and teachers
- IIIa. Nonmanual skilled occupations, e.g., office workers
- IIIb. Manual skilled occupations, e.g., bricklayers, coalminers.
- IV. Semi-skilled occupations, e.g., postal workers
- V. Unskilled occupations, e.g., porters, dustmen.

Weight estimation was with a Marsden Ocean Med weighing scale in (kilograms) and the height with a meter rule. The body mass index (BMI) calculated as weight in kilograms divided by the square of the height in meters (kg/m^2). BMI index status was then classified based on the WHO criteria as normal weight ($18.5\text{--}24.9 \text{ kg/m}^2$), overweight ($25\text{--}29.9 \text{ kg/m}^2$), and

obese ($>30 \text{ kg/m}^2$).

Imaging technique

All imaging were performed with a 0.2 tesla MRI machine (Siemens Magnetom Concerto) 2004 model.

All patients were positioned supine in the MRI scanner with their legs straight in psoas tight position to assure lumbar lordosis. The median sagittal plane of the patients was equidistant to the table edges. A radio frequency surface coil was placed over the patients to cover the lumbar spine. Centering was at L2. The table was then set in motion until the patient was at the isocentre.

Principal imaging was performed using conventional spin echo pulse sequences.

- i. Sagittal, axial and coronal images with a repetition time and echo time (TR/TE) of 500/20 ms; field of view (FOV) 23–26 cm, matrix 288×512
- ii. Axial view with TR/TE of 600–1100/20 ms, FOV of 20 cm, matrix 192×256
- iii. Sagittal view with TR/TE of 2500–3000/110 ms, FOV of 26 cm, matrix 256×512
- iv. Axial view with TR/TE of 4000/120 ms, FOV of 28–30 cm, matrix 328×512 .

Technical specifications included:

- a. Slice thickness of 3 and 4 mm for sagittal and axial images respectively with 1 mm gap
- b. 90° flip angle for T1 and 180° angle for T2
- c. T1- and T2-weighted axial sequences were stacked slices extending from the superior aspect of L1 through the inferior aspect of S1.

Data analysis

Data was analyzed using IBM statistical package for social sciences Statistical Package for Social Sciences (SPSS) Windows Version 20; Chicago, IL, USA. Results were presented as mean $\pm$ standard deviation, percentages, tables, and graphs as appropriate. Means compared using Student's *t*-test. Pearson's correlation was used to assess the association between MRI findings, sociodemographic factors and BMI. $P < 0.05$ considered statistically significant.

Image analysis

The various radiological findings were evaluated by three experienced radiologists and recorded. Inter and intra-observer variation was reduced with the use of nomenclature and classification of lumbar disc abnormalities. The different findings were defined as follows:

Intervertebral disc degeneration was defined by the presence or severity of reduced disc height and/or reduced signal intensity in T2-weighted scans evidenced by loss of normal high signal intensity of the nucleus pulposus on T2-weighted MRI scan.

The presence and type of disc herniation was defined as a protrusion, extrusion and sequestration and level of nerve root impingement were noted. Protrusion was defined as displacement of the nucleus pulposus through some of the fibers of annulus fibrosus, while the remaining was confined by the intact outermost fibers, while extrusion was defined as prominent focal extension of disc material through all layers of the annulus with only an isthmus of connection to parent disc and sequestration as complete separation of the disc material from the parent disc.

Spondylosis was defined by hypertrophy of the facet joints, anterior and posterior osteophytes evidenced by signal void on T1-weighted images and Schmorl's node.

Bone marrow changes were graded according to Modic *et al.*^[8] Type 1 were seen as hyperintense signal intensity on T1- and T2-weighted images, Type 2 seen as hypointense signal on T1- and hyperintense on T2-weighted, and Type 3 seen as hypointense signals on both T1 and T2-weighted images.

Other morphologic characteristics assessed were spondylolisthesis, spinal canal stenosis, annular tear, spondylolysis, and metastases. Spondylolisthesis was graded based on the percentage slip of the vertebrae. Spinal stenosis was analyzed based on Glenn classification where an anteroposterior diameter of the spinal canal 22–25 mm was regarded as normal and stenosis as a canal diameter < 10 mm. This was further subdivided into three types, posterolateral, central, and foraminal stenosis.

Results

One hundred and twenty patients were evaluated with MRI scan during the study period. Their ages ranged from 22 to 80 years with a mean age of 51.0 ± 13.2 years.

Sixty-six (55%) were males and 54 (45%) were females. Male to female ratio was (male: female 1.2:1) but this was not statistically significant ($P = 0.15$) as shown in Table 1. The highest frequency of male patients (28.8%) was in the fourth decade while that of females (38.9%) was in the sixth decade. Based on the United Kingdom Registrar General's classification for occupation, patients were grouped into the five major categories of occupation.

The highest frequency of LBP was found in the sixth decade 33 (27.5%) with male to female ratio of 1:1.2 while the lowest was in the second decade (4.2%) and a male to female ratio of 1.5:1. Ninety-eight (82%) patients had chronic LBP, while 13 (11%) and 9 (7%) had subacute and acute LBP respectively [Table 2].

The mean BMI was 29.5 ± 5.2 kg/m² of these, 23% of the study population had a normal BMI (18.5–24.9 kg/m²), 35%

Table 1: Sociodemographic distribution of patients

Variables	Frequency distribution of patients (%)
Age (years)	
21-30	5 (4.2)
31-40	27 (22.5)
41-50	24 (20)
51-60	33 (27.5)
61-70	25 (20.8)
71-80	6 (5)
Total	120 (100)
Sex	
Male	66 (55)
Female	54 (45)
Total	120 (100)
BMI	
Normal (18.5-24.9 kg/m ²)	27 (23)
Overweight (25-29.9 kg/m ²)	42 (35)
Obese (>30 kg/m ²)	51 (42)
Occupation	
Professionals	49 (40.8)
Managerial	44 (36.7)
Manual skilled	19 (15.8)
Semi-skilled	6 (5)
Unskilled	2 (1.7)

BMI – Body mass index

Table 2: Duration of low back pain according to sex

Duration of low back pain	Males n (%)	Females n (%)	Total n (%)
Acute (<6 weeks)	6 (5)	3 (2)	9 (7)
Subacute (6-12 weeks)	8 (7)	5 (4)	13 (11)
Chronic (>12 weeks)	55 (46)	43 (36)	98 (82)
Total	69 (58)	51 (42)	120 (100)

were overweight (BMI 25–29.9 kg/m²) and 42% were obese (BMI > 30 kg/m²). Among the male population 17 (15%) had normal BMI, 30 (25%) were overweight, and 22 (18%) were obese. For the females 10 (8%) had normal BMI, 12 (10%) were overweight and 29 (24%) were obese. Females had significantly higher mean BMI than males with a mean of 31.0 ± 5.5 versus 28.5 ± 4.7 for males ($P = 0.019$). In addition, the highest frequency (28%) of obese patients fell within the sixth decade.

Pattern of magnetic resonance imaging findings

On MRI, 8% of patients with LBP had normal MRI diagnosis while 92% had an abnormal diagnosis [Figure 1].

Intervertebral disc degeneration was the most frequent finding observed in 90 (75%) patients [Figure 2]. Males had a significantly higher incidence of disc degeneration than females (58% vs. 42% respectively) but this was not statistically significant ($r = 0.024$, $P = 0.749$). The incidence of disc disease was most common at L4/L5 level 36 (40%) followed by L5/S1 level 22 (24.5%), L2/L3 level 15 (16.7%),

L3/L4 level 13 (14.4%), and at L1/L2 4 (4.4%) [Table 3]. Multiple contiguous level disc disease was noted in 62 (52%) of patients [Figure 2]. Reduced height of the disc was observed in 60% of patients.

Disc herniation was observed in 79 patients (65%). Disc herniation classified as normal, protrusion, extrusion and sequestration. Forty-two percent of herniated disc occurred at the L4/L5 level and 24% at L5/S1 level. At L4/L5 level male to female ratio was 1:3 and 1:1 at L5/S1 level. Disc herniation was seen to increase with increasing age with the highest frequencies in the sixth (24%) and seventh (29%) decade and lowest frequency in the third decade (3.8%) but this was not statistically significant ($P = 0.092$). The posterolateral herniation was the commonest site of disc herniation accounting for (76%), poster central (20%) and foraminal (4%).

Nerve root compression were noted more at L4/L5 followed by L5/S1, L3/L4, L2/L3, and L1/L2 in decreasing order of frequency being present in 52% of patients.

Spondylosis was present in (71) 59% of patients. Spondylosis were increased with age with highest frequencies at the fifth (22.5%), sixth (26.7%), and seventh (23.9%). Thirty-nine patients (32.5%) had vertebral bone marrow changes, 20 had Modic *et al.* Type 1 changes (51%), 11 (28%) had Type 2 and 8 (21%) had Type 3. Annular tear, indicated by high-intensity zone, observed in 23 patients (19%) were most common in the fifth decade with a female preponderance.

Spinal canal stenosis was present in 39 patients (32.5%) with 20 males and 19 females. Of these, 26 (68%) had posterolateral stenosis, 9 (22%) had central stenosis and 4 (10%) had stenosis at the foramina.

Other less common findings included spondylolisthesis, which was demonstrable in 6.7% of patients. Grade I was observed the most constituting five cases (62.5%) while Grade II was seen in three cases (37.5%) [Figure 3]. There was no evidence of Grades III and IV spondylolisthesis in our study population. Infection was seen in (5%); spondylolysis was documented in 1.7% and spinal metastasis was also seen in

1.7% of patients [Figure 4]. There was no evidence of primary bone tumor in any patient.

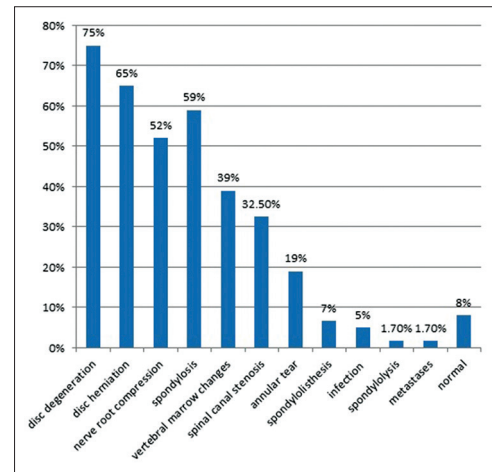


Figure 1: Bar chart showing different magnetic resonance imaging lumbosacral spine findings

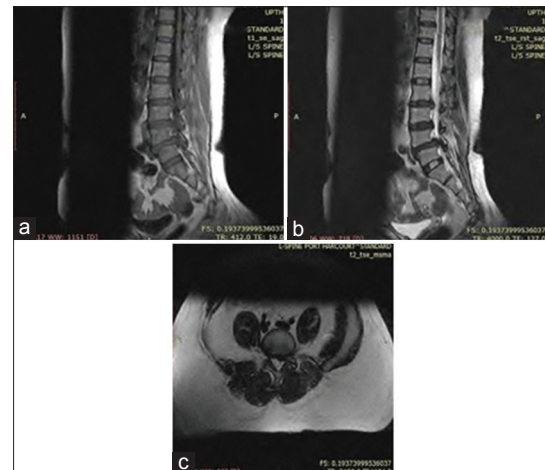


Figure 2: Intervertebral disc degeneration (a) sagittal T1- and (b) sagittal T2-weighted magnetic resonance imaging demonstrate marked disc height reduction of L2/L3, L3/L4, and L4/L5 with loss of signal of the discs and disc protrusion of the aforementioned discs, (c) axial T2-weighted image showing central disc herniation

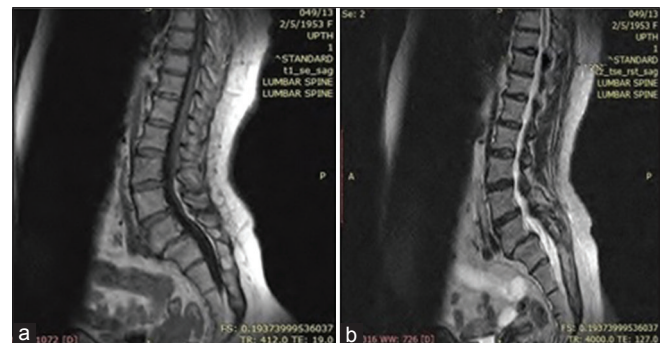


Figure 3: Spondylolisthesis (a) sagittal T1- and (b) sagittal T2-weighted magnetic resonance imaging demonstrate Grade I anterior shift of the vertebra indicative of anterolisthesis. Reduction of the disc height of L5/S1, loss in signal intensity and posterior protrusion of the disc material. L4/L5 disc also shows loss in signal intensity with posterior bulge

Table 3: Number of patients with disc degeneration

Age (years)	Location of disc degeneration					Total (%)	P
	L1/L2	L2/L3	L3/L4	L4/L5	L5/S1		
21-30 (n=4)	-	-	1	2	1	4	0.902
31-40 (n=14)	1	2	2	5	4	16	0.456
41-50 (n=21)	2	3	2	9	5	23	0.023
51-60 (n=26)	-	6	3	11	6	29	0.002
61-70 (n=20)	1	3	5	6	5	22	0.018
71-80 (n=5)	-	1	-	3	1	6	0.255
Total (n=90)	4	15	13	36	22	100	

Association of magnetic resonance imaging findings with sociodemographic factors

Age and body mass index

There was a significant positive linear correlation ($r = 0.342$, $P \leq 0.002$) between the age of the patient and intervertebral disc degeneration [Table 4]. Degeneration of the disc also showed a positive linear correlation with the BMI ($r = 0.433$, $P = 0.001$) [Table 5].

Sex/Occupation

There were no significant positive or negative correlation with

the sex of the patients and MRI findings. However, males had a higher incidence of the intervertebral disc 58% and females had a higher incidence of spondylosis. There were no significant associations between the occupation of the patients and MRI findings [Table 6].

Discussion

LBP is a common debilitating condition worldwide with severe socioeconomic and healthcare consequences.^[9] It is the most frequent cause of the limitation of activity in the working population.^[9,10] Accurate diagnosis of the different etiologies of LBP, therefore, plays a pivotal role in management and prognosis. MRI has become essential in the management of LBP and advocated as a first line investigation in the management of patients with LBP.

The mean age of patients in the study was 51 years. A study done in South-West Nigeria^[11] showed that LBP occurred mostly in those with a mean age of 53.27 years whereas another study done in Kenya^[12] had a lower mean age of 47.4 years. The mean age of the aforementioned studies is not much different from this study. Our largest group of patients was in the sixth decade (27.5%). Irurhe *et al.*^[13] in a prospective study was done in Lagos Nigeria and Mustapha *et al.*^[14] in a retrospective study done in North East Nigeria differed with their highest frequencies of patients occurring in the fifth and fourth decades respectively. The findings of the current study have shown that LBP is predominant in the middle age group. Hence,

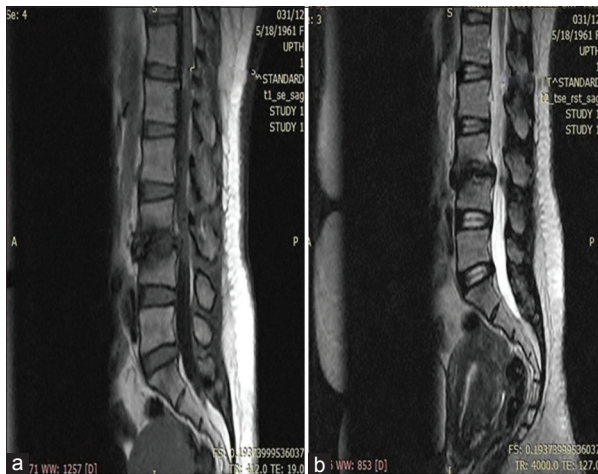


Figure 4: Pyogenic spondylodiscitis (a) sagittal T1- and (b) sagittal T2-weighted images showing a kissing lesion at L3/L4 disc level with destruction of the intervening disc and end plate signal intensity change

Table 4: Sociodemographic distribution of patients with MRI findings

Age	Normal	Disc degeneration	Disc herniation	Spondylosis	Nerve root compression	Spinal canal stenosis	Modic change	Infection	Metastases	Spondylolysis	Test of significance (P)
21-30	5	4	3	1	3	2	-	-	-	1	0.093
31-40	3	14	15	12	8	7	6	3	-	-	0.061
41-50	1	21	17	16	11	11	7	-	-	-	0.038
51-60	1	26	19	19	23	8	14	1	-	1	0.003*
61-70	-	20	23	17	13	10	8	2	2	-	0.002*
71-80	-	5	2	6	4	1	4	-	-	-	0.032*
Occupation											
Professionals	3	38	33	32	24	14	12	2	-	1	0.532
Managerial	2	32	30	27	26	16	12	2	1	1	0.116
Manual-skilled	4	16	12	8	7	9	7	2	1	-	0.842
Semi-skilled	1	2	2	4	2	-	6	-	-	-	0.176
Unskilled	-	2	2	-	3	-	2	-	-	-	0.315

MRI – Magnetic resonance imaging; $\leq 0.05^*$ considered statistically significant

Table 5: Association of MRI findings with BMI

BMI	Disc degeneration	Disc herniation	Spondylosis	Nerve root compression	Spinal canal stenosis	Modic change	Infection	Metastases	Spondylolysis	P
Normal	16	11	7	17	8	7	2	1	-	0.188
Over weight	31	26	24	27	14	13	4	1	1	0.000*
Obese	43	42	40	18	17	19	-	-	1	0.003*

MRI – Magnetic resonance imaging; BMI – Body mass index; $\leq 0.05^*$ considered statistically significant

Table 6: Association of MRI findings with gender

MRI findings	Male n (%)	Female n (%)	Proportion n (%)	Test of significance (P)
Normal	6 (60)	4 (40)	10 (8)	0.345
Disc degeneration	48 (53)	42 (47)	90 (75)	0.797
Disc herniation	49 (62)	30 (38)	79 (65)	0.370
Spondylosis	31 (44)	40 (56)	71 (59)	0.275
Nerve root compression	34 (55)	28 (45)	62 (52)	0.700
Spinal stenosis	18 (46)	21 (54)	39 (33)	0.179
Annular tear	15 (65)	8 (35)	23 (19)	0.051
Metastases	2 (100)	-	2 (0.7)	0.271
Spondylolisthesis	3 (37.5)	5 (62.5)	8 (6.7)	0.341
Spondylolysis	1 (50)	1 (50)	2 (1.7)	0.803
Modic change	19 (49)	20 (51)	39 (33)	0.341
Infection	3 (50)	3 (50)	6 (5)	0.093

MRI – Magnetic resonance imaging

LBP could be likely due to the normal aging process or is multifactorial.

Consistent with other research,^[15,16] we observed an increasing incidence of LBP as the BMI increases. Forty-two percent, of the study, populations were obese, 35% were overweight and 23% were normal weight. Females had a significant higher BMI than males. Possible explanations for this may be because physical loading on the disc in the form of elevated BMI biomechanically affects the disc or is due to other causes not well understood. The majority of the patients presenting with LBP were employed and professionals. The results demonstrate that LBP was most common up to 40.8% of professionals, but the difference was not statistically significant. It is plausible that the professionals are more highly paid and, therefore, could afford the cost of MRI.

Disc disease was the most frequent feature observed in 75% of patients seen more in the sixth decade this corresponds with the study by Cassar-Pullicino^[17] who observed that by the age of 50 years and above 97% of individuals would have a degenerative disc. Adeyinka and Omidiji^[11] in Ibadan and Igbinedion and Akhigbe in Benin.^[18] Nigeria all corroborated this findings, however, Irurhe *et al.*^[13] in a similar study done in Lagos had a lower incidence of 27%. 62.5% of patients had multiple level disc diseases. This agreed with other studies that showed similar findings.^[19,20] There was a significant positive association between the increasing age and presence of degenerative disc disease as well as an increase in BMI. Jarvik *et al.*^[21] found an association with the increasing age while Samartzis *et al.*^[15] found an association between disc degeneration and BMI in agreement with the findings of this study.

Sixty five percent of the study population had a herniated disc with 42% of herniated disc occurring at L4/L5 level. The increased frequency of disc herniation at these levels concurred with other studies.^[11,22] Herniation of the disc seen

to increase in both sexes with age may be due to the laxity, demineralization, and desiccation that comes with aging. There was no significant association between herniation of the disc and the sociodemographic factors. The common type of disc herniation observed was the protrusion of the disc seen in 53 patients while the most common site was posterolateral (76%); this compares well with the findings of other previous studies.^[20,22,23]

In this study, spondylosis progressively increased with the increasing age with 22.5% and 26.7% seen in the fifth and sixth decade respectively. This is likely due to the long duration of back pain (82%) this patient had and as such, the normal physiological mechanism of restabilization had set in and, therefore, was visible on imaging. This is in agreement with other studies.^[21,22] Furthermore, the prevalence of spondylosis increased with an increase in the BMI whereby 40 (56.3%) were obese, 24 (33%) overweight and seven (9.8%) normal weight. Samartzis *et al.* had similar findings.^[15] Females had a higher incidence of spondylosis (56%) as opposed to the males (44%) although, not statistically significant.

Nerve root compression noted in previous studies^[21,24] is one of the common MRI findings seen in LBP, seen in those with other associated findings like herniation of the disc. In this study, 52% of patients had compression of at least one nerve root. Males were slightly more affected than females with prevalence 55% and 45% respectively concurrent with a previous study.^[19] The high prevalence of nerve root compression is likely due to the high incidence of degeneration of the disc with resultant protrusion and nerve compression.

Stenosis depending on the extent of the degeneration could be central, lateral, and foraminal.^[25,26] Stenosis can occur alone or in combination with L4–L5 disc usually implicated. Mboka.^[19] in Tanzania observed stenosis of the spinal canal in 30% of the study population similar to findings of 32.5% in the current study. Katz *et al.*^[26] and Uduma *et al.*^[20] differed with a higher incidence of 46% and 66% respectively while Irurhe *et al.*^[13] had a lower incidence of 20%. The high incidence of spinal stenosis is likely due to the high incidence of disc herniation in this study, which is one of the common acquired causes of spinal canal stenosis.

The bone marrow is a dynamic organ that undergoes developmental, age and environmental related changes. Bone marrow changes constituted 32.5% of the MRI findings with Type 1 lesions being the most common change accounting for 51%; these findings corroborated the findings by Toyone *et al.*^[27] which found Type 1 changes as the most common change but was in contradistinction to Mboka.^[19] who had more of Type 2 change.

Spondylolisthesis is the anterior or posterior slip of vertebrae relative to the segment below. Spondylolisthesis is classified

based on etiology as dysplastic, isthmic, and degenerative, traumatic, pathologic and iatrogenic spondylolisthesis. Spondylolisthesis observed in 6.7% of the study population was seen more in females predominantly in the sixth decade this corroborated with Igbinedion and Akhigbe^[18] in their study and is more in keeping with the degenerative type of spondylolisthesis. Spondylolysis had a low prevalence of 1.7% in this study. The low prevalence of spondylolysis is likely due to the age category of the study population.

Infection of the spine accounts for 2–4% of skeletal infections.^[28] Involvement of two consecutive vertebrae and the intervening disc is virtually diagnostic for infectious spondylitis, however; other disease processes may mimic infections of the spine therefore recognizing the different patterns on MRI imaging may help to make the distinction due to its high sensitivity and specificity.^[28] Five percent of the study population had infections of the spine occurring more in the fourth decade with equal sex distribution and no occupational predilection. The MR imaging features are similar to that observed in other studies.^[28,29]

Metastases constituted 2% of the study population seen in the seventh decade in males due to prostatic cancer confirmed by biopsy. This is in keeping with other studies that have shown the prostate cancer as one of the most common primary tumors to cause spinal metastases.^[30] The percentage seen is, however, lower than other studies; Adeyinka and Omidiji^[11] had an incidence of 7.1%; this may be due to the sample size. There was no association with metastases and the sociodemographic factors.

The limitation of the study was the high cost of MRI therefore only those who could afford it were able to participate in this study. Also the incessant power supply made imaging in most days unachievable.

Conclusion

Intervertebral disc degeneration is a common cause of LBP in patients presenting for MRI scans in our environment accounting for 75% of cases. Its incidence is associated with an increase in age and BMI.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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