PATTERN OF RADIOGRAPHIC FINDINGS IN PATIENT WITH LOWER BACK PAIN UNDERGOING LUMBOSACRAL X-RAY IN AMINU KANO TEACHING HOSPITAL, KANO STATE, NIGERIA.

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ARTICLE INFO	ABSTRACT

Background: Low back pain (LBP) was ranked the second cause of lost days at work, and approximately $50 billion per year is spent on it in the US. It is a very common health problem as it affects all ranges of population, gender and age.

Objective: The study is aimed at evaluating pattern of radiographic findings in patient with lower back pain undergoing lumbosacral x-ray in Aminu Kano Teaching Hospital, Nigeria

Materials and Methods: The study was a prospective and cross-sectional study conducted in Aminu Kano Teaching Hospital from June 2019 to September 2019. A convenience sampling method was employed in the study, one hundred and twenty two selected adult patients with a history of lower back pain were studied. Ethical approval to conduct the study was obtained from the Human Research and Ethics Committee of the Aminu Kano Teaching Hospital and informed consent was obtained from every selected subject. The radiographs were evaluated by two radiologist independently. The obtained data was analyzed using SPSS version 21.0 software.

Results: The study involved one hundred and twenty two adult elected subjects; 52.5% were females while 47.5% were males. The mean age, standard deviation and range of the males selected subjects was 44.65 ± 13.18 (22-71) years, for females it was 41.95 ± 13.68 (18-78) years and for total it was found to be 43.09 ± 13.47 (18-78) years. Lumbar spondylosis was seen in 47.5%, straightening of normal lumbar lordosis was 27%, lumbar lordosis 4.1%, Osteoblastic metastasis 3%, with scoliosis, sclerosis each having 1% and the normal finding was 16.%.

Conclusion: Lumbar spondylosis was the common finding especially in the middle aged and elderly and more prevalent among the males selected subjects.

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INTRODUCTION

Lower back pain (LBP) is a term that refers to pain, muscle tension, or stiffness localized below the costal margin and above the inferior gluteal folds which may or may not radiate to the thigh and legs [1][2][3]. The duration of the pains varies in an area of the anatomy affected [1][2] as is classified as either acute, sub-acute or chronic. Acute back pain lasts less than a month, sub-acute lasts last over a month but less than three months, and chronic lasts over three months [1][4]. The prevalence of LBP in Africa is lower when compared with the developed countries [5], with a point prevalence of 10%-59% in Africans [6] and 12%–33% among Western societies [6] and overall prevalence increases with age until 60–65 year age group and then gradually declines and was higher among females (45%) than males (31%) [7]. Risk factors for LBP includes psychological, stress, anxiety, working conditions, increased height, weight or pathological such osteoporotic fractures, neoplasm or infection [7]. LBP is a very common health problem as it affects all ranges of population, gender and age. [7][8] Mentioned that it affects 70% to 85% of the adult population at some point in life occurring in similar proportions in all cultures, interferes with quality of life and work performance, and is the most common reason for medical consultations [7]. LBP was ranked the second cause of lost days at work, and approximately $50 billion per year is spent on it in the US [9].

The radiological investigations for the management of LBP ranges from plain radiography, computed tomography (CT), Magnetic Resonance Imaging (MRI), myelography, radionuclide imaging. Other more invasive methods include epidural venography, vertebroplasty, discography etc. [10]. However, plain radiography is the most commonly requested by the referring physicians because it is cheap and readily available and also vital in the assessment of radiographic findings [11]. The commonest radiographic findings seen in lower back pain includes; spondylosis, spondylolisthesis and degenerative disc diseases [10]. Kiridi et al. [11] found out that osteophytes were the commonest finding and were seen in (72.3%) of patients while in a study by Vining et al. [12] lumbar disc degeneration happens to be the most prevalent and commonest finding at L3-4 (49%). Osteophytes were demonstrable in (73.6%) making it the commonest finding in a study carried out by Igbinedion & Akigbe [10]. To the researcher's knowledge there was no documented study conducted in Aminu Kano Teaching Hospital to determine the pattern of radiographic findings in patient presenting with lower back pain. The findings of this study will serve as a guide to the, radiologist, radiographers and physicians in the diagnosis and management of patients with lower back pain. The study is aimed at evaluating pattern of radiographic findings in patient with lower back pain undergoing lumbosacral x-ray in Aminu Kano Teaching Hospital, Nigeria

MATERIALS AND METHODS

The study was a prospective and cross-sectional conducted in Aminu Kano Teaching Hospital from June 2019 to September 2019. A convenience sampling method was employed in the study, one hundred and twenty two adult selected subjects with a history of lower back pain were studied. Ethical approval to conduct the study was obtained from the Human Research and Ethics Committee of the Aminu Kano Teaching Hospital (AKTH) and informed consent was obtained from every selected subject. Anterio-posterior (AP) and lateral radiographs were done for all patients by qualified radiographers using standard radiographic techniques. The radiographs were evaluated by two radiologist independently. The identification number extracted from the patients request form was used in identifying the findings for each patient the following day after it has been reported by the radiologist. The demographic information, identification number and the radiographic findings was documented in a well-structured data capture sheet. The mean, standard deviation and range was obtained using descriptive statistics. The obtained data was analyzed using SPSS version 21.0 software.

RESULTS

Table 1 shows the mean and standard deviation of the males selected subjects to be 44.65 ± 13.18 while that of the females selected subjects to be 41.95±13.68.

Table 1: Age of the selected subjects

Gender	Male (n=58)	Female (n=64)	Total (n=122)
Mean ± SD,	44.65±13.18	41.95±13.68	43.09±13.47
Range (years)	(22-71)	(18-78)	(18-78)

SD= Standard Deviation.

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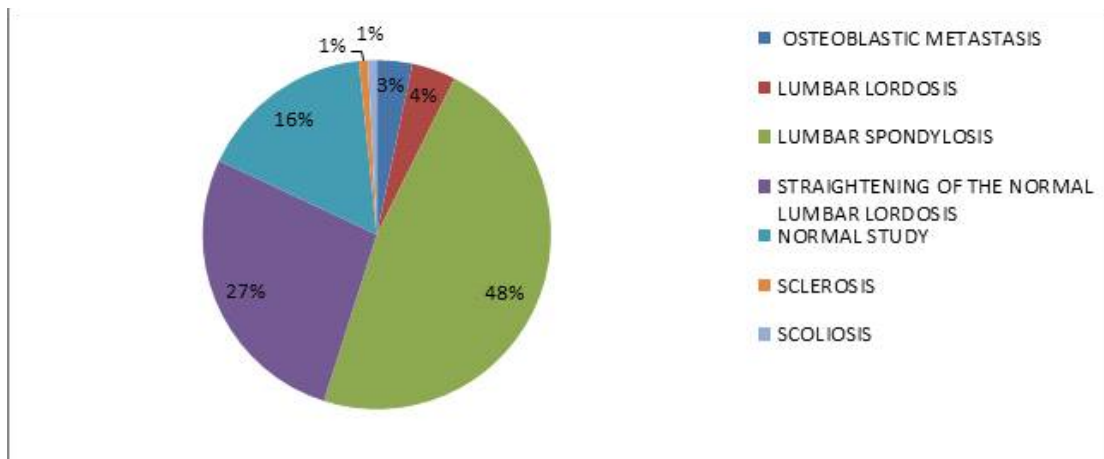
Figure 1: Radiographic findings of the selected subjects with lower back pain

Figure 1 shows majority of the respondents (48%) had lumber spondylosis followed by 27% that had straightening of the normal lumber lordosis. Sclerosis and scoliosis had the lowest percentage.
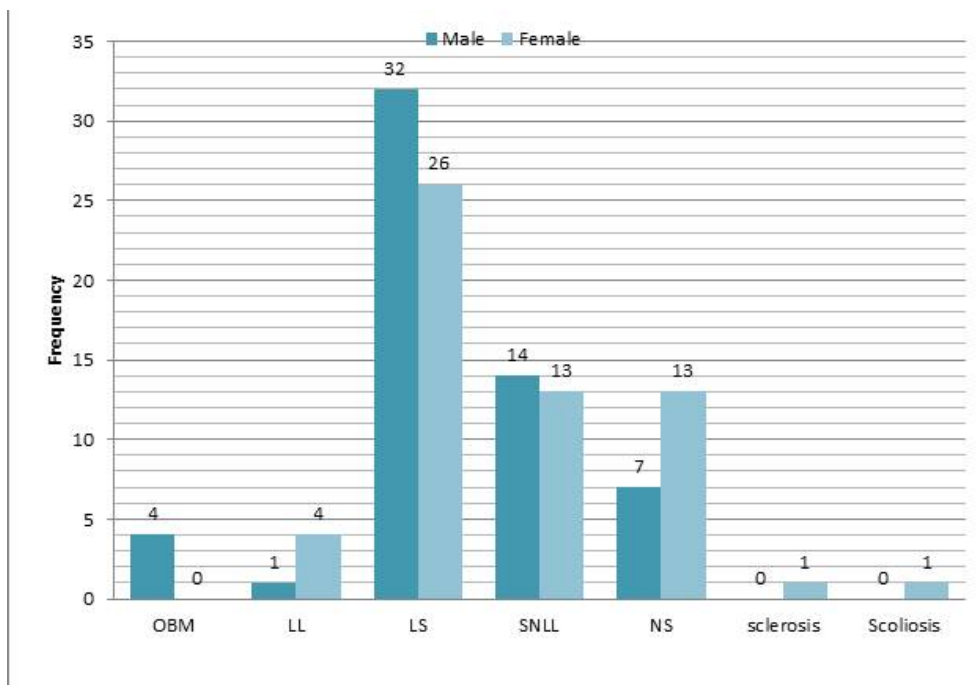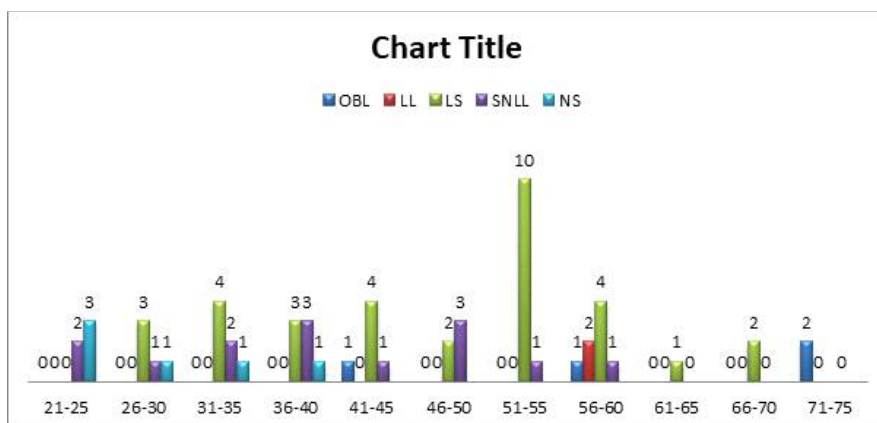

**Fig. 2: Frequency of the findings base on gender**

Figure 2 shows males are more affected with Osteoblastic metastasis, Lumbar spondylos is and Straightening of normal lumbar lordosis while females are more affected with Lumbar lordosis, sclerosis and scoliosis.

Osteoblastic metastasis, LL: Lumbar lordosis, LS: Lumbar spondylosis, SNLL: Straightening of normal lumbar lordosis, NS: Normal studies

Fig. 3: Frequency of male findings based on age

Figure 3 shows that in males, Lumbar spondylos is more frequent within the age of 51-55 years, Straightening of normal lumbar lordosis more affects those within the age of 36-50 years, Lumbar lordosis affects only those within the age of 56-60 years.
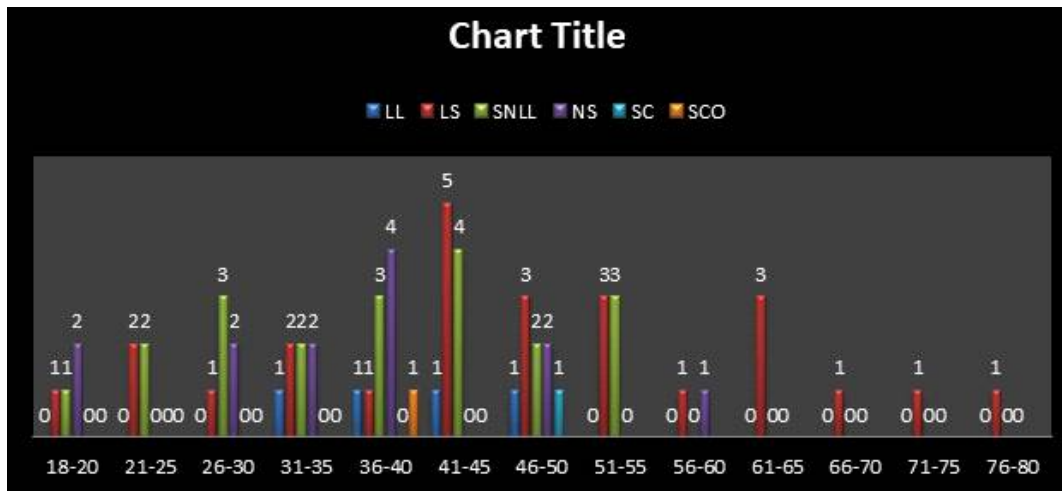
LL: Lumbar lordosis LS: Lumbar spondylosis, SNLL: Straightening of normal lumbar lordosis, NS: Normal studies, SC: Sclerosis, SCO: Scoliosis.

Fig. 4: Frequency of Female findings based on age
Figure 3 shows that in females, Lumbar spondylos and Straightening of normal lumbar lordosis are more frequent within age of 41-45 years, lumbar lordosis affects only those within the age of 31-50 years while sclerosis and scoliosis affects those within the age of 36-40 and 46-50 years respectively.

DISCUSSION

The findings of this study as shown in Table are similar to the findings of the study conducted by Kiridi et al., [11] that reported 47.07 ± 15.71 as the mean age of the affected subjects. The similarities might be because the two studies were conducted in Nigeria or because majority of the patients presenting with LBP are within the age of 40 years in both .studies. The findings of this study as shown in Figure 1 are contrary to the findings of the study conducted by Kiridi et al., [11] that reported a higher prevalence 52 (24.6%) of normal findings. Although both studies were conducted in Nigeria, the possible reason might be because the former study used a larger sample size than the current study. The reason for high prevalence of normal radiographic findings in patient presenting with LBP could be due to the limited role of plain radiographs in the evaluation of acute LBP as it has lower sensitivity when compared with sophisticated imaging modalities such as MRI [13]. MRI is considered as the imaging modality of choice for the diagnosis of LBP, however due to its

limited availability and cost, plain radiograph stands as the most frequent request [14]. Thus imaging should be reserved for specific indication as recommended by American College of Physicians (ACP) and the American Pain Society (APS)[15][16].

The findings of this study as shown in Figure 1 shows that lumbar spondylosis (LSP) was the commonest finding seen in 58(48%) of the selected subjects. The findings are in agreement with the study of [11] as they reported 159 (72.3%). The current study also shows that LSP is more frequent in males than females; 32(26.2%) in males selected subjects and 26(21.3%) females selected subjects as shown in Figure 2. However, the findings are contrary to the findings of the studies conducted by Ahidjo et al., [17] and Seichi [18] that reported females with more cases of LSP than males. However, the variation might be as a result of race, ethnicity, genetic predisposition, occupation and cultural differences. The findings of this study as shown in Figure 3 shows that LSP is more frequent 10(8.2%) in males selected subjects with age

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between 51 to 55 years while in females selected subjects is more frequent 5(4.1%) between the age of 41-45 years as shown in Figure 4. The findings are in agreement with the findings of the study conducted by Francis, [19] that reported male with more cases of LSP within the age of 55–64 and female within the age of 45–54 years. Generally LSP increases as age increases in both genders until the age of 51-55 years and 41-45 years in male and female participant respectively as shown in Figure 3 and 4. The findings of the current study are in agreement with the findings of the studies conducted by [2][11][20][21][22]. The findings of this study as shown in Figure 1 also shows that the straightening of normal lumbar lordosis (SNLL) was the second commonest finding in this study with a frequency of 27(27%), and slightly more prevalent 14(11.5%) among males selected subjects than females 13(10.7%). SNLL is more frequent 3(2.5%) in male participants with age between 46 to 50 years while in female participant is more frequent 4(3.3%) between the age of 41-45 years as seen in Figure 3 and 4. Figure 1 indicated that 4(4%) had Lumbar lordosis (LL), affecting more females 3(3%) than males participants 1(1%). Females within the age of 31 to 50 years are more affected 1(1%) while males within the age of 56-60 years 2(1.63%) as shown in Figure 3 and 4. The findings goes in similar direction with the findings of Ansari *et al.*, [23] as they found more cases of SNLL (72%) than LL (24%). However dissimilar with the study of Kiridi *et al.*, [11] having more LL cases (67%) than SNLL (27%). This variation could be due to differences in sample size and geographic distribution.

Furthermore, the findings of this study as shown in Figure 1 shows that only 4(3.3%) of the participants had osteoblastic metastasis (OBM) in which all are males within the age of 41-75 years as shown in Figure 2 and 3. In patients affected by bone metastases of unknown origin, one of the most important prognostic and treatment conditioning factors is the histological type, and therefore biopsy is mandatory in an attempt to detect the primary cancer [24][25][26]. With regard to skeletal findings, the radiographic appearance of the bone lesions is a valuable clue for suggesting the primary; bone CT and MRI are generally used as complementary techniques to confirm the presence of the metastases and to characterize them [26][27][28][29]. The findings of this studies as shown in Figures 1, 2 and 4 shows that only (1%) female participants within the ages of 46 to 50 had

sclerosis and scoliosis respectively. Pryse *et al.*, [30] found similar findings as incidence rates for males remained stable whereas rates for females showed an impressive and continuing increase. Sharron & Warren. [31] stated that the frequency of sclerosis varies by geographical region throughout the world, increasing with distance from the Equator in both hemispheres and more common among women than men with peak onset around age 30 years. MRI is the imaging of choice when the disease is indicated [31]. The findings of this study as also shown in figures 1, 2 and 4 indicated that only 1(1%) female participants within the ages of 36 to 40 had scoliosis. The findings are in agreement with those described in previous studies [32][33][34][35]. Scoliosis is usually detected through a school screening program and is considered a powerful tool that can identify individuals with unrecognized scoliosis at an early stage when less invasive treatment is more effective Hutchison & Grivas. [36]. Progression of untreated scoliosis in patients during periods of rapid growth may lead to severe deformity, which may be accompanied by restrictive pulmonary disease [32][37][38][39] and social psychogenic problems [32][40][41]. Early detection by screening programs and application of an effective orthopedic and rehabilitation treatment are essential for avoiding scoliosis progression, minimizing the need for an operation [32][42][43][44][45][46][47] and reducing associated costs [32][47][48][49].

CONCLUSION
Lumbar spondylosis was the commonest finding in the middle aged and elderly and more prevalent among the male patients.

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