

Pattern of Lesion Depicted on Plain Knee Radiographs in a Negroid Population.

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ABSTRACT

Plain knee radiography is a reliable diagnostic imaging procedure that gives useful details on knee lesions. Knee joint lesions and anomalies can significantly impede or stop one's ability to live an active life style and perform basic day to day activities. The objective of this study was to determine the relationship between the various knee lesions, gender, and age distribution of the patients in a Negroid population.

A cross sectional retrospective study was conducted reviewing 167 patients report using data capture sheet containing vital information of the patients reports such as age, sex, various indications, and findings. Descriptive statistics were generated from the data using SPSS version 16.0. Result showed that females (50.9%) were more prone to knee joint lesion than male (49.1%). It has also shown that osteoarthritis is the most common lesion of the knee joint and that the age group of 41-50 years old is most susceptible.

(Key terms: lesion, knee joint, plain radiograph, radiography, Radiography)

INTRODUCTION

The knee joint is the largest and the most superficial joint within the lower limb (Moore and Dalley, 2006). It is a hinge type of synovial joint and is made up of three bones; the femur, tibia bone and patella. The fibula is not involved in the knee joint (Johnson and Steinbach, 2004). The knee consist of three articulations which are two femoro-tibial articulations (lateral and medial) and one intermediate femoro-patella articulation between the patella and the femur (Drake *et al.*, 2005).

The strength and actions of the surrounding muscles, ligament and their tendons that connect the femur and tibia determines the stability of the knee joint. The most important muscle in stabilizing the joint is the quadriceps femoris, particularly the inferior fibres of the vastus medialis and lateralis (Bantnager,2006). The knee joint could develop a lesion which could affect its proper function.

A lesion is a zone of tissue with impaired function as a result of damage by disease or wounding (Oxford Concise Medical Dictionary, 2003). Lesions that could affect the knee joint are osteoarthritis, fractures, bursitis, soft tissue injuries (tear of the anterior and posterior cruciate ligament), popliteal cyst, and/or knee replacement (Chintelle, 2012). A plain radiograph is exposed and processed films which in most cases possesses diagnostic value (Eze, 2014).

Radiographic imaging is the first line investigation of knee pathologies as it provide a cost effective, reliable, easily accessible, quick and safe method of assessing acute and chronic knee conditions (Drake *et al*, 2005). Some of the lesions could be depicted on plain radiograph.

Antero-posterior and lateral views are considered standard and further imaging with oblique radiograph is now rarely requested as computed tomography (CT) scan, ultrasound scan, magnetic resonance imaging (MRI) is usually better placed to provide further details (Takesh *et al.*, 2011). The purpose of this study is to determine the common cause of knee lesion, as well as the gender and age group commonly affected.

MATERIALS AND METHODS

A retrospective cross-sectional design was used for the study. Plain knee radiographs' reports in the Radiology Department of Federal Neuro Psychiatric Hospital Maiduguri, were utilized for the study. Data capture sheet was used to obtain information on; Patients' age, gender, indication, provisional diagnosis and findings. Data were analyzed using Statistical package for social sciences (SPSS) version 16.0 and descriptive statistic such as percentage and frequency were generated from the existing data. Ethical clearance was obtained from the research and ethical committee of the same hospital.

RESULTS

Out of 167 patients reports, the result shows that the age group that has the highest frequency of knee findings ranged from 41-50 years with 24.6% (n=41) and the lowest frequency was noted in the age group of 1-10 years as shown in Table 1.

Gender distribution of the study shows the females are more susceptible to knee lesion with 50.9% compared to their male counterpart with 49.1% as demonstrated in Table 2.

The result of the study shows that osteoarthritis has the highest occurrence of 62.7% (n=105) followed by fracture with 5.4% (n=9) while the least were cellulitis and avascular necrosis of femoral condyle (0.6%, n=1), respectively, as shown in Table 3.

The result of the study shows the relationship of knee lesion and age of the patients that participated in the study. Among the various knee

lesions, osteoarthritis has the highest frequency of occurrence across the range of age from 11-80 years, but has the greater frequency of occurrence (n=30) in the age group of 41-50 years as shown in the Table 4.

Table1: Age Distribution of the Patients.

Age	Frequency	Percent
1-10	3	1.8
11-20	11	6.6
21-30	16	9.6
31-40	34	20.4
41-50	41	24.6
51-60	30	18.0
61-70	20	12.0
71-80	12	7.2
Total	167	100.0

Table 2: Gender Distribution of the Study.

Gender	Frequency	Percent
Male	82	49.1
Female	85	50.9
Total	167	100.0

On the relationship between knee lesions and gender of the participants, the study shows high frequency of the occurrence of osteoarthritis in the female patients (n=60) than the male patients (n=45). The other frequent occurring lesion in the study is fracture. The result of the study shows the highest frequency of occurrence of fracture in the male patients (n=7) than the female patients (n=2) as shown in Table 5.

Table 3: Frequency Distribution of Knee Lesions.

Findings	Frequency	Percentage
Normal	41	24.6
Osteoarthritis	105	62.7
Valgus Deformity	3	1.8
Fracture	9	5.4
Osgood schlatters disease	3	1.8
Cellulitis	1	0.6
Osteoporosis	2	1.2
Rheumatoid Arthritis	2	1.2
Avascular necrosis of the femoral condyle	1	0.6
Total	167	100

Table 4: Frequency Distribution of Knee Lesions and Associated Age.

Findings	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	Total
Normal	2	7	10	7	7	4	4	1	42
Osteoarthritis	0	1	4	21	30	24	15	10	105
Valgus deformity	1	0	0	2	0	0	0	0	3
Fracture	0	0	0	3	3	2	1	0	9
Osgood Schalter disease	0	3	0	0	0	0	0	0	3
Cellulitis	0	0	1	0	0	0	0	0	1
Osteoporosis	0	0	0	0	1	0	0	1	2
Rheumatoid arthritis	0	0	1	1	0	0	0	0	2
Avascular necrosis of the femoral condyle	0	0	1	0	0	0	0	0	1
Total	3	11	17	34	41	30	20	12	167

Table 5: Frequency Distribution of Knee Lesions and Associated Gender.

Findings	Male	Female	Total
Normal	23	19	42
Osteoarthritis	45	60	105
Valgus Deformity	2	1	3
Fracture	7	2	9
Osgood Schlaters disease	1	2	3
Cellulitis	1	0	1
Osteoporosis	2	0	2
Rheumatoid Arthritis	2	0	2
Avascular necrosis of the femoral condyle	0	1	1
Total	82	85	167

DISCUSSION

The study shows that females 85 (50.9%) are more prone to knee lesion than the males, 82 (49.1%). This corresponds to the research conducted by Hawemdeh, (2013), that gender distribution of osteoarthritis patients predominates more in females than in males and can be attributed to the role of muscle mass as it is generally reduced in females and size difference in men and women, as women generally have smaller joints space and lesser cartilage which may expose them to more joint problems in middle and old age. This is because age is a linking factor to osteoarthritis. Also this study is in favor of work done by Chanist (2013), that said females are more susceptible to knee joint pathologies.

The findings recorded in this study include; osteoarthritis 105 (62.9%), normal 41 (24.6%), valgus deformity 3 (1.8%), cellulitis 1 (0.6%), osteoporosis 2 (1.2%), rheumatoid arthritis 2 (1.2%) and avascular necrosis of the femoral condyles 1 (0.6%), with the highest finding being

osteoarthritis. This is keeping in line with the study conducted by Damon and Chintelle (2012), that said osteoarthritis is depicted more on radiographs of the knee joint. Also, this corresponds with another study conducted by Takesh *et al.*, (2011), which states that osteoarthritis of the knee is the most common form of arthritis and is a major contributor to functional impairment and reduced independence in older adults. The susceptible age group affected by knee lesion is 41-50 years. This concurred with a study conducted by Hawemdeh, (2013) which states that the age group of 41-50 years are more prone to knee lesions.. This may be associated with reduced physical activities such as exercise which makes the knee joint stronger.

CONCLUSION

The most common lesion of the knee joint in the study locality is osteoarthritis and females within the age limit of 41-50 years are more affected.

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