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Original Research

Magnetic Resonance Imaging of Internal Derangements and Other Knee Pathologies in Adult Nigerians

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Abstract

Background: Knee joint pathologies/injuries are one of the most common musculoskeletal complaints in adults worldwide. The aetiologies of knee joint disorders are diverse. Magnetic resonance imaging (MRI) is a sophisticated method of detecting and characterizing knee pathologies. This study was conducted to document the clinical presentation and MRI patterns of knee joint abnormalities in a group of adults in Lagos, Nigeria, and to juxtapose it with reports from other climes.

Methodology: A retrospective hospital-based analysis of the knee MRI of 158 adult Nigerians was conducted in a single health facility. The clinical history and knee MRI findings were extracted, analyzed, and documented. Statistical significance was established at $P \leq 0.05$.

Results: There were 158 participants comprising 92 males (58.2%) and 66 females (41.8%) between the ages of 18 and 79. The mean age of the males was 44.75 ± 14.41 years, while that of the females was 47.76 ± 13.72 years ($P = 0.19$). A history of previous trauma was elicited in 135 (85.4%) participants. Eighty-two right knees (51.9%) and 76 left knees (48.1%) were examined. The dominant joint pathologies detected include effusion (77.2%), medial meniscopathy (48.1%), tibial abnormalities (46.2%), femoral abnormalities (46.2%), patella abnormalities (46.2%), anterior cruciate ligament disorders (37.3%), lateral meniscopathy (27.2%), medial collateral ligament disorders (22.2%), and popliteal (Baker's) cysts (15.8%). ACL abnormalities were significantly more prevalent in male subjects. Knees with ruptured sACL had significantly more joint effusion and injuries to the medial meniscus, lateral meniscus, posterior cruciate ligament (PCL), medial retinacular ligament (MRL), femur, tibia, and fibula. There was no significant difference in the frequency of abnormalities between the right and left knees.

Conclusion: Joint effusion, medial meniscopathy, osseous abnormalities (tibia, femur, patella), ACL abnormalities, lateral meniscopathy, and MCL abnormalities, in decreasing order, were the most frequent pathologies in the knee joints evaluated.

Keywords: Knee Joint Diseases, Magnetic Resonance Imaging, Menisci, Cruciate Ligaments, Internal Derangement

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Introduction

The knee, the largest and most complex joint in the body, is a synovial hinge joint that comprises the patellofemoral, medial, and lateral femorotibial compartments, stabilized by a delicate array of muscular, tendinous, ligamentous, cartilaginous, and capsular structures. Its numerous bursae facilitate easy mobility of the joint's stabilizing structures.[1,2]

The first reports of Magnetic Resonance Imaging (MRI) assessment of knee injuries were published in 1983; however, the MRI results rarely influenced management decisions which relied mainly on arthrographic and physical examination findings.[3–5] In contrast, modern MRI scanners demonstrate the vast majority of the osseous and non-osseous components of the knee joint in exquisite detail.[1,2,6]MRI is now the non-invasive imaging method of choice for virtually all clinical indications involving the knee.[7]

Although arthroscopy is the gold standard for intra-articular knee pathologies, its cost, invasiveness, and operator dependence have now made it a more therapeutic surgical procedure than a diagnostic tool.[7,8]Furthermore, partial tears and intrasubstance tears of the anterior cruciate ligament (ACL) are difficult to evaluate on arthroscopy. Similarly, via the conventional anteromedial arthroscopy portal, ramp lesions at the posterior third of the medial meniscus are often inaccessible.[9]

Reduced arthroscopic operations, improved diagnostic certainty, and simplified management choices are benefits of using MRI to diagnose and treat knee pathologies.[10]Compared to arthroscopy, the respective meta-analyzed sensitivity and specificity of knee MRI for ACL and meniscal tears are ACL (87%; 93%), medial meniscus (92%; 90%), and lateral meniscus (80%; 95%).[11,12]Even where there is no subspecialist musculoskeletal radiologist, interpretation of knee MRI by general radiologists shows acceptable accuracy rates.[13]
"Internal derangement of the knee (IDK) is an inclusive term used to indicate (alone or in combination) certain disorders of the joint, including (alone or in combination) torn meniscus, loose bodies in the knee, and damaged collateral or cruciate ligaments. The term does not signify chronic disorders such as chondromalacia patellae, congenital discoid meniscus, meniscal cysts, or degenerative processes such as knee osteoarthritis."[14]

Previous studies in the local population showed the knee to be a common site of osteoarthritis.[15]Furthermore, tibia (most commonly fractured bone), femur, and patella fractures constituted 25.0 - 32.6%, 19.2 - 19.6%, and 1.6% of all post-traumatic extremity fractures in other local studies.[16,17]

A recent analysis of MRI requests showed a low number of knee MRI orders (1% of all MRI studies over a two-year duration)[18], even though MRI scanners are now more available than before.[19,20]MRI use in Nigeria is still hampered by non-availability (due to high procurement, installation, and maintenance costs), frequent breakdowns, low-field strength machines, and unaffordability.[18,21] Consequently, there is a paucity of data on the MRI pattern of knee disorders in Nigerians. Previous knee MRI studies in Nigerians had either been carried out using low-field strength (0.2 T) MRI machines, focused on only meniscal/ACL pathologies, or assessed normal knee structures.[22–25] This study used a 1.5 T MRI machine with a larger sample size.

The objective of this retrospective study was to investigate the frequency and range/array of pathologies in adult Nigerians who underwent knee MRI at a single health facility and compare/contrast the results to those of other studies conducted in different regions of the world.

Materials and Methods

This was a retrospective descriptive study that included the records of 158 patients who had undergone knee MRIs at the radiology department of our institution. The sample size was calculated using the Fischer formula:[26]

$$N = \frac{Z^2 pq}{d^2}$$

Where:
N = Sample size
Z = Standard normal deviate = 1.96 (corresponding to 95% Confidence interval)
p = Proportion of target population estimated to have knee pain (0.115)[15]
$q = 1.0 - p = 1.0 - 0.115 = 0.885$
d = Degree of accuracy desired, usually set at 0.05
Substituting these into the formula yields

$$N = \frac{3.8416 \times 0.115 \times 0.885}{0.0025}$$

$N = 156$

The Health Research and Ethics Committee (**UUTH/AD/S/96/VOL.XXI/440**) approved the study protocol. Informed consent was waived because of the retrospective study design. The study included all the knee MRI scans done over the study period.

Data on the patients' demographics, imaging indications, and other relevant medical information was retrieved from their electronic medical records. All adult Nigerians having complete clinical data, MRI images, and radiologists' reports of knee MRI scans between December 2019 and December 2021 were included in the study. Participants included any adult patient who reported knee symptoms (pain, swelling, limited movement, etc.) regardless of whether they had a history of trauma. Individuals with inadequate clinical history, past knee surgery, inferior quality MRI images, and incomplete/inconclusive studies were excluded. The MRI images and reports were re-analyzed by one diagnostic radiologist with eight years of experience.

The MRI scans were performed on a 1.5 Tesla General Electric Optima MR scanner (GE Healthcare, Chicago, Illinois, USA) in an extremity coil using a small field of view (14-16 cm, including the suprapatellar bursa and patellar tendon insertion on the tibial tubercle), 4 mm slice thickness, and 0.4 mm interslice gap. The participant was scanned in the supine position (feet first in the MRI scanner), with the knee under evaluation externally rotated by 15-20 degrees to aid the imaging of ACL in the sagittal plane. In addition, the knee was flexed 5-10 degrees to evaluate the patellofemoral compartment.[4]

The sequences acquired (in axial, sagittal, and coronal planes as appropriate) were T1-weighted (T1W), T2-weighted (T2W), Short Tau Inversion Recovery (STIR), Proton Density weighted Imaging (PDWI), and Proton Density weighted Fat Saturation (PDFS). Image interpretation and diagnostic criteria adhered to the published glossary of terms, classifications, and criteria.[6]

The study data were entered into an Excel spreadsheet (Microsoft, Redmond, Washington, USA) and analyzed with IBM SPSS Statistics for Windows, version 20 (IBM Corp., Armonk, N.Y., USA). Categorical variables were presented as absolute and relative frequencies (%), while continuous variables were presented as mean values. Mean values were compared with the student's t-test, while percentages were compared with the Chi-square test and likelihood ratio test (for percentages <5). Statistical significance was $P \leq 0.05$.

Results

There were 158 participants comprising 92 males (58.2%) and 66 females (41.8%) aged 18 – 79. The mean age was 46.01 ± 14.16 years. Ninety-two subjects were ≤ 46 years old, while 66 were > 46 years old. There was no statistically significant difference between the mean age of the male (44.75 ± 14.41 years; range = 18 – 79 years) and female (47.76 ± 13.72 years; range = 24 – 75 years) participants (*P* = 0.19). The age subgroups were 18-20 years (5; 3.2%), 21-30 years (17; 10.8%), 31-40 years (34; 21.5%), 41-50 years (47; 29.7%), 51-60 years (23; 14.6%), 61-70 years (25; 15.8%), and 71-80 years (7; 4.4%).

An overwhelming majority (136; 86.1%) presented with knee pain followed by knee pain and swelling in 20 subjects (12.7%). Just two subjects (1.3%) complained of only knee swelling. History of previous trauma was elicited in 135 (85.4%) participants (80 males and 55 females; 69 right and 66 left knees). There was no antecedent trauma in 23 (14.6%) subjects (12 males and 11 females; 13 right and 10 left knees). There were 82 right knee (51.9%) and 76 left knee (48.1%) MRI studies.

All the knee MRI scans done over the study period were abnormal. The major structural pathologies of the knees detected on MRI are summarized in Table 1.

Table 1. Frequency of major knee pathologies

Knee pathologies (All knees; N=158)	**Frequency (n)**	**Percentage (n/N x 100)**
Abnormal medial meniscus	76	48.1%
Abnormal lateral meniscus	43	27.2%
Abnormal ACL	59	37.3%
Abnormal PCL	8	5.1%
Abnormal MCL	35	22.2%
Abnormal LCL	8	5.1%
Abnormal MRL	4	2.5%
Abnormal patellar tendon	14	8.9%
Abnormal popliteus tendon	7	4.4%
Abnormal QT	16	10.1%
Abnormal BFT	1	0.6%
Joint effusion	122	77.2%
Abnormal Synovium	8	5.1%
Abnormal femoral cartilage	17	10.8%
Abnormal tibial cartilage	11	7.0%
Abnormal femur	73	46.2%
Abnormal tibia	73	46.2%
Abnormal patella	68	43%
Abnormal fibula	8	5.1%
Baker's cyst	25	15.8%

**ACL – Anterior cruciate ligament; BFT – Biceps femoris tendon; PCL – Posterior cruciate ligament; MCL – Medial collateral ligament; LCL – Lateral collateral ligament; MRL – Medial retinacular ligament; QT – Quadriceps Tendon*

***Knee pathologies were not mutually exclusive, total percentages may exceed 100%*

Menisci

The medial menisci of 82 knees (51.9%) were normal. It had tears only in 24 (15.2%), degenerative changes only in 24 (15.2%), extrusion only in two (1.3%), meniscocapsular separation in two (1.3%), and various combinations of degenerative changes, tear, and extrusion in 24 (15.2%) knees.

The lateral meniscus was normal in 115 knees (72.8%). It had degenerative changes only in 14 (8.9%), tears only in 20 (12.7%), various combinations of degenerative changes, tears, and extrusion in 8 (5.1%), and extrusion only in one knee (0.6%).

Ligaments

The ACL was normal in 99 (62.7%) of the 158 participants. Partial tear (32; 20.3%), mucoid degeneration (16; 10.1%), and complete rupture (13; 8.2%) were the identified ACL abnormalities.

The posterior cruciate ligament (PCL) was normal in 150 (94.9%) of the 158 participants. Partial tear (7; 4.4%) and mucoid degeneration (1; 0.6%) were the other identified abnormalities of the PCL.

The medial collateral ligament (MCL) was normal in 123 subjects (77.8%) and partially torn in 35 subjects (22.2%). The lateral collateral ligament was normal in 150 subjects (94.9%) and partially torn in eight (5.1%) subjects.

The medial retinacular ligament (MRL) was normal in 154 subjects (97.5%) and partially torn in four (2.5%) subjects. The lateral retinacular ligament was normal in all the knees.

Tendons

The patellar tendon was normal in 144 subjects (91.1%), showed tendinosis in 11 (7.0%), and was partially torn in three (1.9%) subjects. The popliteus tendon was normal in 151 subjects (95.6%) and showed tendinosis in seven (4.4%) subjects. There were twelve (7.6%), three (1.9%), and one (0.6%) cases of quadriceps tendinosis, partial tear, and rupture, respectively. The biceps femoris tendon was abnormal (tendinosis) in only one (0.6%) subject.

Bones

The femoral pathologies observed include osteophytes (53; 33.5%), contusion (18; 11.4%), subchondral cysts (3; 1.9%), infarction (1; 0.6%), and enchondroma (1; 0.6%). The tibial abnormalities sighted include osteophytes (48; 30.4%), contusion (19; 12.0%), and subchondral cysts (5; 3.2%). The patellar pathologies detected were chondromalacia (47; 29.7%), osteophytes (14; 8.9%), subluxation/dislocation (8; 5.1%), and patella alta (8; 5.1%). Fibula osteophytes (4; 2.5%), contusion (3; 1.9%), and subchondral cysts (1; 0.6%) were the fibular lesions identified.

Cartilage

Femoral articular cartilage irregularity and full-thickness cartilage ulceration were seen in 15 (9.5%) and two (1.3%) knees, respectively. Tibial articular cartilage irregularity was present in 11 (7.0%) knees.

Synovium

Localized synovitis was seen in five knees (3.2%), while there was one case each (0.6%) of generalized synovitis, chondromatosis, and synovial proliferation. Mild, moderate, and massive joint effusion occurred in 80 (50.6%), 37 (23.4%), and five (3.2%) knees, respectively.

Other Findings

Other findings include Baker's cyst (25; 15.8%), Hoffa fat pad oedema/injury (20; 12.7%), soft tissue oedema (15; 9.5%), loose bodies (4; 2.5%), bursitis (3; 1.9%), osteochondroma (2; 1.3%), and fabella (1; 0.6%). Only ACL abnormalities were significantly more prevalent in the male subjects

Table 2. Proportion of abnormal knee structures by sex

Pathology	**Male; N = 92**	**Female; N = 66**	***P* value**
	n (%)	**n (%)**	
Medial Meniscus	44 (47.8%)	32 (48.5%)	0.07
Lateral Meniscus	25 (27.17%)	18 (27.3%)	0.80
ACL	36 (39.1%)	23 (34.8%)	**0.04**
PCL	6 (6.5%)	2 (3.0%)	0.62
MCL	23 (25%)	12 (18.2%)	0.67
LCL	5 (5.4%)	3 (4.5%)	0.70
MRL	4 (4.3%)	0	0.40
Patella tendon	11 (13.3%)	3 (5.6%)	0.19
Popliteus tendon	6 (6.1%)	1 (1.4%)	0.13
Quadriceps tendon	11 (12%)	5 (7.6%)	0.74
BFT	1 (1.1%)	0	0.40
Joint Effusion	74 (80.4%)	48 (72.7%)	0.51
Synovium	5 (5.4%)	3 (4.5%)	0.34
Femoral cartilage	11 (12%)	6 (9.1%)	0.77
Tibial cartilage	7 (7.6%)	4 (6.1%)	0.71
Femur	45 (48.9%)	28 (42.4%)	0.40
Tibia	42 (45.7%)	31 (47%)	0.58
Patella	38 (41.3%)	30 (45.5%)	0.74
Fibula	2 (2.2%)	6 (9.1%)	0.06
Baker's cyst	9 (9.8%)	13 (19.7%)	0.07

ACL – Anterior cruciate ligament; BFT – Biceps femoris tendon; PCL – Posterior cruciate ligament; MCL – Medial collateral ligament; LCL – Lateral collateral ligament; MRL – Medial retinacular ligament

Using the mean age (46.01 years) as cut-off, abnormal medial meniscus, femoral abnormalities, tibial abnormalities, joint effusion, and Baker's cyst were significantly more prevalent in the participants > 46 years old than those ≤ 46 years old

Table 3. Proportion of abnormal knee structures by mean age

Pathology	**≤ 46 years; N =92**	**> 46 years; N = 66**	***P* value**
	n (%)	**n (%)**	
Medial Meniscus	30 (32.6%)	46 (69.7%)	**<0.0001**
Lateral Meniscus	18 (19.6%)	15 (22.7%)	0.17
ACL	36 (39.1%)	23 (34.8%)	0.16
PCL	5 (5.4%)	3 (4.5%)	0.42
MCL	17 (18.5%)	18 (27.3%)	0.31
LCL	4 (4.3%)	4 (6.5%)	0.49
MRL	2 (2.17%)	2 (3%)	0.53
Patella tendon	10 (10.9%)	4 (6.5%)	0.19
Popliteus tendon	5 (5.4%)	2 (3%)	0.47
Quadriceps tendon	9 (9.8%)	7 (10.6%)	0.69
Biceps Femoris Tendon	1 (1.1%)	0	0.40

Joint Effusion	66 (71.7%)	56 (84.8%)	**0.01**
Synovium	4 (4.3%)	4 (6.5%)	0.47
Femoral cartilage	10 (10.9%)	7 (10.6%)	0.45
Tibial cartilage	9 (9.8%)	2 (3%)	0.10
Femur	31 (33.7%)	42 (63.6%)	**<0.0001**
Tibia	28 (30.4%)	45 (68.2%)	**<0.0001**
Patella	39 (42.4%)	29 (43.9%)	0.77
Fibula	2 (2.17%)	6 (9.1%)	0.06
Baker's cyst	9 (9.8%)	13 (19.7%)	**0.02**

ACL – Anterior cruciate ligament; BFT – Biceps femoris tendon; PCL – Posterior cruciate ligament; MCL – Medial collateral ligament; LCL – Lateral collateral ligament; MRL – Medial retinacular ligament

Knees with rupture of the ACL had significantly more joint effusion, and injuries to the medial meniscus, lateral meniscus, PCL, MRL, femur, tibia, and fibula.

Table 4. Proportion of abnormal knee structures with and without ACL rupture

Pathology	**ACL rupture; N = 13** **n (%)**	**No ACL rupture; N = 145** **n (%)**	***P* value**
Medial Meniscus	10 (77)	66 (45.5)	**0.02**
Lateral Meniscus	9 (69.2)	35 (24.1)	**<0.0001**
PCL	2 (15.4)	6 (4.1)	**0.01**
MCL	5 (38.5)	30 (20.7)	0.47
LCL	1 (7.7)	7 (4.8)	0.80
MRL	1 (7.7)	3 (2.1)	**0.01**
Patella tendon	0	14 (9.7)	0.50
Popliteus tendon	1 (7.7)	6 (4.1)	0.55
Quadriceps tendon	1 (7.7)	15 (10.3)	0.95
BFT	0	1 (0.7)	0.76
Joint Effusion	12 (92.3)	110 (76)	**<0.0001**
Synovium	1 (7.7)	7 (4.8)	**0.02**
Femoral cartilage	3 (23.1)	14 (9.7)	0.07
Tibial cartilage	2 (15.4)	9 (6.2)	0.21
Femur	11 (84.6)	62 (42.8)	**0.04**
Tibia	11 (84.6)	62 (42.8)	**0.02**
Patella	5 (38.5)	63 (43.4)	0.07
Fibula	1 (7.7)	7 (4.8)	**0.01**

Baker's cyst	2 (15.4)	20 (13.8)	0.31

ACL – Anterior cruciate ligament; BFT – Biceps femoris tendon; PCL – Posterior cruciate ligament; MCL – Medial collateral ligament; LCL – Lateral collateral ligament; MRL – Medial retinacular ligament

Fifty-nine knees (37.3%) had various ACL abnormalities [Partial tear (32; 20.3%), mucoid degeneration (16; 10.1%), and complete rupture (13; 8.2%)]. PCL injury (7/59 = 11.9% vs 1/99 = 1%; *P* = 0.02) and joint effusion (49/59 = 83.1% vs 73/99 = 73.7%; *P* = 0.03) were significantly more prevalent in the knees with abnormal ACL than those with a normal ACL. There was no statistically significant difference in the frequency of abnormalities between the right and left knees.

Figures 1 and 2 are representative images of some pathologies encountered.

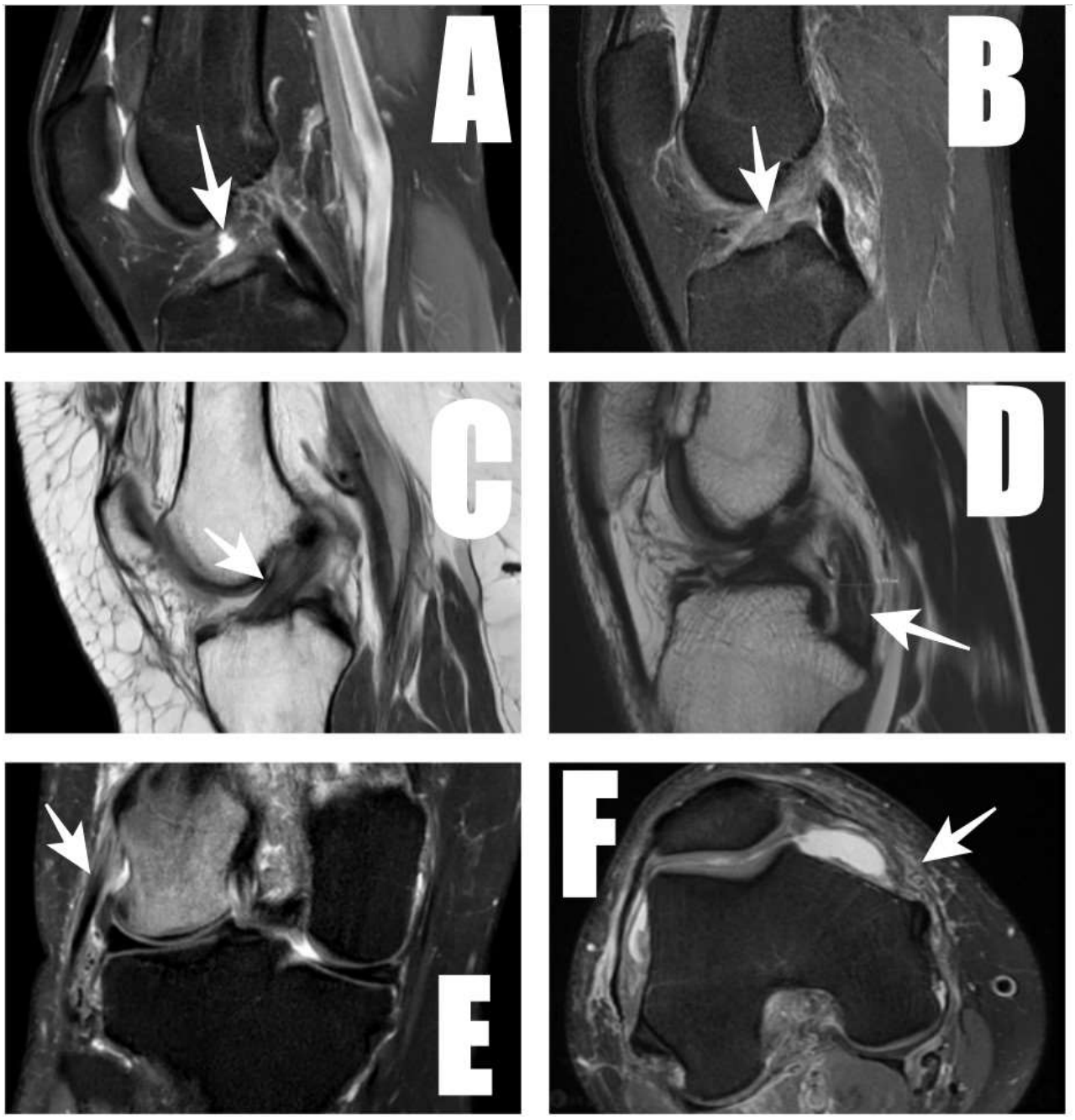

Figure 1. Proton density fat-saturated (PDFS) sagittal MRI of the knee (A & B) showing ACL rupture as absent ACL. Sagittal T1W images show celery stalk appearance of ACL mucoid degeneration (C) and partial tear of the PCL (D). PDFS Coronal view shows a partial tear of the lateral collateral ligament and severe contusion of the lateral femoral condyle (E). Axial PDFS (F) shows avulsion of the medial retinacular ligament.

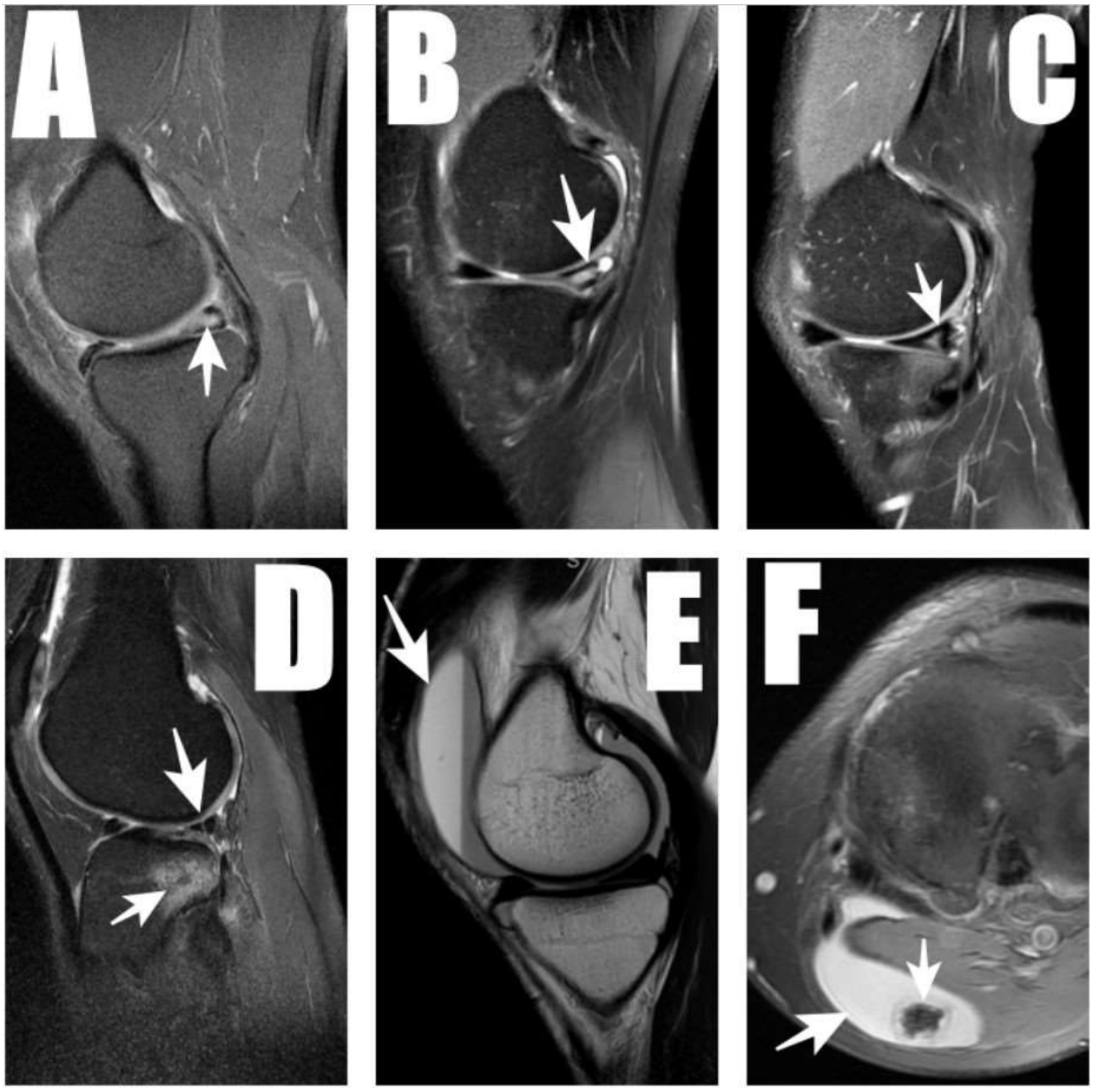

Figure 2. Proton density fat-saturated (PDFS) sagittal MRI of the knee showing degeneration (A) of the posterior horn of medial meniscus (PHMM), horizontal tear of PHMM with parameniscal cyst (B), complex tear of PHMM (C), and vertical tear of the posterior horn of lateral meniscus + lateral tibial condyle contusion (D). The sagittal T2W image shows lipohemarthrosis as a fat fluid level (E), while the axial PDFS image shows a Baker's cyst containing a loose body (F).

Discussion

This retrospective study analyzed the array of knee abnormalities in adult Nigerians detected on MRI at a single health facility. The 41-50 years (29.7%) and 31-40 years (21.5%) age groups constituted the bulk of participants. The vast majority (85.4%) of the study population had a history of trauma to the examined knee. Joint effusion, medial meniscal pathologies, osseous abnormalities, ACL pathologies, lateral meniscopathy, and medial collateral ligament injuries were the most common joint abnormalities on MRI. A history of previous trauma was elicited in 135 (85.4%) participants (80 males and 55 females; 69 right and 66 left knees). This rate is much higher than the 22.4% reported by Gizaw in Ethiopia.[27]

Joint effusion, the most prevalent abnormality, was present in 77.2% of the examined knees. This effusion prevalence is consistent with the 73.0 – 91.2% reported in previous studies.[7,28–31] On MRI, significant pathological knee effusion is diagnosed when the fluid thickness at the suprapatellar recess and or the posterior joint recess is ≥ 10 mm.[32] Rheumatological diseases, infection, trauma, synovial diseases, vasculitides, haemoglobinopathies, and neoplastic lesions are known causes of knee joint effusion.[6] Knee effusion alters the joint's biomechanics (increased hamstring activity, decreased quadriceps activity, gait cycle alterations).[33] In patients with established knee osteoarthritis, effusion is associated with a substantial increase in pain and disability, while effusion volume predicts disease progression.[34,35]

The menisci reinforce the knee joint's stability, distribute the axial load, absorb stress and shock, and keep the joint lubricated and nourished. The menisci transmit 50% of the load in the medial compartment and 70% in the lateral compartment; removing the menisci elevates contact stress by 100% in the medial compartment and by 200% to 300% in the lateral compartment.[6] Medial meniscopathy was seen in 48.1% of the knees, while lateral meniscopathy affected 27.2%. Previous authors also reported similarly higher rates of medial meniscus (MM) than lateral meniscus (LM) injuries – Gizaw(MM = 20.8%, LM = 2.0%)[27], Thapa*et al*. (MM = 26.2%, LM = 12.6%)[29], Arumugam *et al*. (MM = 32%, LM = 22%)[8], Radhakrishnan *et al*. (MM = 36%, LM = 22%)[36], Ningappa *et al*. (MM = 47%, LM = 13%)[37], Ahirwar *et al*. (MM = 49%, LM = 18%)[7], Vaidya*et al*. (MM = 64%, LM = 31%)[5], Mangukiya *et al*. (MM = 68%, LM = 40%)[28], and Sagar*et al*. (MM = 81%, LM = 53%).[30]Meniscal injuries increase axial and shear stress, predisposing to adjacent cartilage degradation and osteoarthritis.[6]

Ligamentous derangement predominantly affected the ACL (37.3%) and MCL (22.2%). The PCL, LCL, and LCL were abnormal in relatively few knees. Previous studies also had the ACL as the most injured ligament (32-90%).[5,7,8,28,29,36–38] The ACL is the most frequently injured knee ligament because it is one of the two cruciate ligaments that stabilize the joint coupled with the absence of muscular support for twisting and rotational movements around the knee.[39,40]

Baker's cysts (popliteal cysts) were the most prevalent non-specific finding at 15.8%, which lies within the range of 4%-33% reported by previous investigators.[5,22,30,38,41] Although often found incidentally, popliteal cysts have a well-known association with joint effusion, meniscal tear, and ACL tear. In a study of 3355 popliteal cysts, MRI detected an associated disorder in 94% of the cases.[42,43]

We surmise that the disparities in the proportion of abnormal knee MRI findings among the various studies could be explained, at least partly, by differences in rates of previous trauma, study designs (prospective vs. retrospective), MRI field strength, age of the study populations, physical activity levels of participants, and level of expertise of the interpreting radiologist.

In conclusion, joint effusion, medial meniscopathy, osseous abnormalities (tibia, femur, patella), ACL abnormalities, lateral meniscopathy, and MCL abnormalities, in decreasing order, were the most frequent pathologies in the knee joints evaluated.

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