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Original Research

Osgood-Schlatter Disease in Nigerian Adolescents: A Retrospective Review

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Objectives

Osgood-Schlatter disease (OSD) is a common cause of anterior knee pain in adolescents. Local data on OSD is scarce in sub-Saharan African populations, including Nigeria. This study aimed to analyze the demographic, clinical, radiological, and treatment patterns of OSD in a Nigerian population.

Methods

This was a retrospective review of 25 patients aged 10–15 years diagnosed with OSD at a rural tertiary hospital in Nigeria from January 2017 to December 2024. Data on demographics, clinical presentation, sports participation, imaging findings, and treatment were analyzed.

Results

The mean age was 12.52 ± 1.29 years, with a male predominance of 68%. Bilateral knee involvement was observed in 40% of cases, and 88% of patients participated in sports, primarily soccer and running. All patients experienced anterior knee pain, which was exacerbated by kneeling (100%) and squatting (100%). Knee swelling was present in 76% of cases, while gait abnormalities were noted in 40% of patients. The mean duration of knee pain before presentation was 6.36 ± 3.88 months. Radiographic findings included enlarged tibial tuberosity (88%), soft tissue swelling (76%), irregular tibial apophysis (64%), and separation of the tibial tubercle (52%). All patients received conservative management, with 100% achieving complete resolution.

Conclusion

The findings on OSD in Nigerian adolescents align with global trends, showing male predominance and high sports participation. Conservative treatments remain highly effective, emphasizing the need for increased awareness and early diagnosis to prevent chronic complications.

INTRODUCTION

Osgood-Schlatter disease (OSD) is named after Robert Osgood and Carl Schlatter, who independently described the disease in 1903.[1] It is a common osteochondrosis that results from repetitive traction forces exerted by the patellar tendon, leading to inflammation and tenderness at the tibial tuberosity.[2,3] Adolescents aged 10–15 years who participate in physical activities, especially during rapid skeletal growth, are most commonly affected. It is a leading cause of anterior knee pain within this age group.[4,5]

Microtrauma at the secondary ossification center of the tibial tuberosity is the underlying cause of OSD. Sports involving explosive knee extensions, such as soccer, running, basketball, and gymnastics, further exacerbate the condition.[3,6] Repetitive quadriceps contraction during these activities increases mechanical stress on the developing tibial apophysis, raising OSD risk.[5,7]

The prevalence of OSD has been reported to range from 9.8% to 33.3%.[6,8-10] It is more common among adolescents who actively participate in sports compared to those who do not.[6] Risk factors include male gender, participation in high-impact sports, and biomechanical factors such as quadriceps tightness.[11] Traditionally described as a male injury, recent epidemiological data indicate an increasing incidence in the adolescent female population as a result of increased participation in organized sports.[3,12]

Clinically, OSD presents with anterior knee pain that worsens with exercise and improves with rest.[2] On physical examination, localized edema and tenderness over the tib-

ial tubercle are common findings, often accompanied by a palpable prominence at the patellar tendon insertion site.[2,13] Diagnosis of OSD is primarily clinical, however, radiographic imaging can confirm the diagnosis and rule out other differential pathologies.[5,7,14]

Although OSD is typically self-limiting and resolves after skeletal maturation, its active phase may cause significant impairment in function and quality of life.[15,16] Conservative treatment remains the mainstay of management and includes rest, ice application, compression, activity modification, and the use of anti-inflammatory drugs. In some cases, patellar bracing or strapping may be used. Surgical intervention is rarely required and is reserved for refractory cases.[16,17]

Despite global data on OSD, epidemiological studies in Nigeria are scarce and limited to isolated reports.[18-20] In a study to evaluate pediatric rheumatic disease in Lagos, only one case of OSD was documented.[21] Underreporting and misdiagnosis likely obscure the true burden of the disease in a country where physical activity is integral to daily life. This gap hinders data-driven clinical decisions and underscores the need for local epidemiological insights.

This study aimed to analyze the demographic, clinical, radiological, and treatment patterns of OSD in a Nigerian population. It aims to provide local insights, raise awareness among physicians about musculoskeletal disorders in growing children, and improve outcomes for young athletes in Nigeria.

METHODS

STUDY DESIGN, SETTING, AND POPULATION

This was a retrospective review conducted from January 2017 to December 2024 at the rheumatology clinic of a rural teaching hospital in Edo State, South-South Nigeria. The study population comprised adolescent boys and girls who were diagnosed with OSD during the study period. Patients were included if they had a diagnosis of OSD with complete medical records. Those with incomplete records or an alternative diagnosis explaining knee pain were excluded. The study adhered to the principles outlined in the 1964 Declaration of Helsinki for research involving human participants and was approved by the Institutional Health Research Ethics Committee. The informed consent requirements were waived due to the retrospective nature of the study.

DATA COLLECTION

The medical records of eligible patients were retrieved, and the data were extracted using a pre-designed data collection form. The following variables were captured: demographic information, clinical presentation, physical examination findings, radiological findings, and treatment. All data were anonymized to ensure patient confidentiality and compliance with ethical standards.

STATISTICAL ANALYSIS

Data were entered into a spreadsheet and analyzed using IBM Statistical Package for the Social Sciences (SPSS®) version 25 for Windows. Continuous variables were expressed as mean ± standard deviation or median (interquartile range), depending on their distribution, while categorical variables were presented as frequencies and percentages.

RESULTS

A total of 25 patients diagnosed with OSD were included in this review. The age range was 10 to 15 years, with the majority (68%) within the 12 to 13-year age group. The mean age was 12.52 ± 1.29 years. Males constituted 68% of the cohort, while females accounted for 32%. Most patients (76%) had a normal weight, while 24% were overweight. Table 1 shows the sociodemographic and anthropometric characteristics of patients with OSD.

The primary complaint among all the patients was anterior knee pain. All patients had tenderness at the level of the tibial tubercle. Bilateral knee pain was reported by 10 patients (40.0%), right knee pain by 9 patients (36.0%), and left knee pain by 6 patients (24.0%). The nature of the pain varied, with 13 patients (52.0%) describing it as dull, 7 patients (28.0%) as aching, and 3 patients (12.0%) as sharp. The mean duration of pain prior to presentation was 6.36 ± 3.88 months. Activities that commonly exacerbated the pain included kneeling (100.0%), squatting (100.0%), and knee bending (52.0%). Gait abnormality was present in 10 patients (40.0%), with limping being the most common (28.0%). Knee swelling was reported in 19 patients (76.0%), and a history of trauma was noted in 1 patient (4.0%). Table 2 shows clinical characteristics and pain-related features in patients with OSD.

Among the patients, 22 (88.0%) participated in sports, with running (40.0%) and soccer (56.0%) being the most prevalent. The frequency of sports activity was twice a week for 56.0% of patients, once a week for 36.0%, and three times a week for 8.0%. All patients underwent radiographic imaging. The most common findings included enlarged tibial tuberosity (88.0%), soft tissue swelling (76.0%), irregular tibial apophysis (64.0%), and separation of the tibial tubercle (52.0%). Table 3 shows the sporting activities and imaging findings in patients with OSD.

All patients (100.0%) received conservative treatment, with no surgical interventions performed. The conservative treatments included rest (100.0%), analgesics (88.0%), activity modification (84.0%), ice application (52.0%), and knee taping (16.0%). All patients experienced complete resolution of symptoms following conservative management. The majority of patients (80.0%) were followed up for less than one year, while 20.0% had a follow-up duration of one year or more. Table 4 shows the conservative treatment modalities used in patients with OSD.

Table 1. Sociodemographic and anthropometric characteristics of patients with OSD

Variable	Frequency	Percentage (%)
Age Group (Years)		
10-11	5	20.0
12-13	15	60.0
14-15	5	20.0
Mean ± SD	12.52 ± 1.29	
Gender		
Male	17	68.0
Female	8	32.0
Level of Education		
Primary	3	12.0
Secondary	22	88.0
Body Mass Index (Kg/m^2)		
Normal weight (18.5-24.9)	19	76.0
Overweight (25-29.9)	6	24.0

OSD: Osgood-Schlatter disease; SD: standard deviation

DISCUSSION

Despite being a recognized and leading cause of anterior knee pain in active adolescents, OSD remains underreported in Nigerian populations. This retrospective review of 25 cases among Nigerian adolescents revealed a male predominance and a mean age of 12.52 years. All patients experienced knee pain exacerbated by activities such as kneeling and squatting. All patients had resolution of symptoms with conservative treatment, reaffirming its effectiveness. This study offers important insights into the clinical presentation, radiographic features, and treatment of OSD in a Nigerian population.

The demographic characteristics observed in this study align with global literature on OSD. The age range of 10 to 15 years, with a mean age of 12.52 ± 1.29 years, is consistent with previous studies identifying OSD's peak incidence during the period of rapid skeletal growth.[5,8,22,23] Symptoms typically first appear between the ages of 8 and 12 years in females and 12 and 15 years in males. This period coincides with the development of the secondary ossification center of the anterior tibial tuberosity.[3,5] While OSD is primarily an adolescent condition, adult cases have been reported.[8]

The male predominance (68%) observed is well-documented in the literature and is attributed to differences in growth patterns and physical activity levels.[23] However, increasing female participation in organized sports is altering the traditional gender distribution of OSD.[5,16] This highlights the importance of gender-inclusive preventive strategies in sports programs.

A notable observation was the presence of overweight status in 24% of patients, suggesting an emerging association between excess weight and increased mechanical stress on the tibial tuberosity. A prospective study of young male soccer players identified body mass index (BMI) as a pathogenic risk factor for OSD, with higher BMI increasing the likelihood of developing the condition.[10] This association warrants further investigation to determine if weight management should be incorporated into preventive and therapeutic strategies.

Patients in our study exhibited clinical features consistent with previous reports.[8,17,24] This includes anterior knee pain (100%), knee swelling (76%), and gait abnormalities (40%). Tenderness and localized edema at the tibial tubercle were consistent with global descriptions.[3,11] The mean symptom duration before presentation was 6.36 ± 3.88 months, closely matching the 6.7-month duration reported by Gaulrapp et al.[25] This suggests delayed medical attention, likely due to limited awareness, challenges in accessing specialized care, or misconceptions about adolescent knee pain as 'growing pains.'

Pain characteristics varied, with 52% describing it as dull and 28% as aching, reflecting the chronic inflammatory nature of OSD.[3,24] Bilateral knee involvement (40%) in our cohort is higher than the global average of 20–30%[3] but closely mirrors the 39% prevalence reported by Kireti et al.[22] in Nairobi. This may reflect the high level of physical activity among Nigerian adolescents. The symptoms of knee pain in this study were exacerbated with activities such as kneeling and squatting, consistent with a previous report.[22] The low incidence of trauma history (4%) reinforces OSD as an overuse syndrome rather than an acute injury.[8,24]

Sports participation was reported in 88% of patients, with soccer and running being the most common activities. This high participation rate reinforces the well-established link between OSD and high-impact activities involving repetitive knee extension.[6,8] The frequency of sports participation provides additional context for understanding OSD development in these patients. More than half (52.6%) participated in sports twice weekly, suggesting that even moderate-frequency high-impact activities may be sufficient to trigger OSD in susceptible individuals during

Table 2. Clinical characteristics and pain-related features in patients with OSD

Variables	Frequency	Percentage (%)
Location of Knee Pain		
Right Knee	9	36.0
Left Knee	6	24.0
Bilateral Knee	10	40.0
Character of Pain		
Dull	13	52.0
Sharp	3	12.0
Aching	7	28.0
Stabbing	2	8.0
Duration of Pain		
< 3 months	3	12.0
3-6 months	12	48.0
6-12 months	5	20.0
> 12 months	5	20.0
Mean ± SD	6.36 ± 3.88	-
Severity of Pain		
Mild (1-3)	6	24.0
Moderate (4-6)	16	64.0
Severe (7-10)	3	12.0
Pain Related to Activity		
Yes	25	100.0
Selected Normal Activities Exacerbating Pain		
Kneeling Pain	25	100.0
Sitting Pain	5	20.0
Squatting	25	100.0
Knee Bending	13	52.0
Gait Abnormality		
Limping	7	28.0
Antalgic	3	12.0
Normal	15	60.0
Knee Swelling		
Yes	19	76.0
No	6	24.0
History of Trauma		
Yes	1	4.0
No	24	94.0

OSD: Osgood-Schlatter disease; SD: standard deviation

growth spurts. Insufficient recovery time between physical activities has been identified as a key risk factor for OSD.[11] This emphasizes the need for structured training programs with adequate rest periods in Nigerian schools, where sports participation is often informal and unstructured.

The common radiographic features of OSD in this study included an enlarged tibial tuberosity (88%), soft tissue swelling (76%), an irregular tibial apophysis (64%), and separation of the tibial tubercle (52%). These findings align with the pathophysiology of OSD, which involves inflammation and reactive bone formation due to repetitive traction forces.[3,5] Radiological imaging confirms the diagnosis and helps rule out other causes of anterior knee pain, such as quadriceps tendon avulsion, patellofemoral stress syndrome, pes anserine bursitis, chondromalacia patellae, bone tumors, osteomyelitis of the proximal tibia, patellar tendonitis, and Sinding-Larsen-Johansson syndrome.[5,7,26,27]

All patients in our cohort received conservative treatment with complete resolution of symptoms. This includes

Table 3. Sporting activities and imaging findings in patients with OSD

Category	Variables	Frequency	Percentage (%)
Sporting Activities	**Engaged in Sports**		
	Yes	22	88.0
	No	3	12.0
	Type of Sports (n = 22)		
	Running	10	40.0
	Soccer	14	56.0
	Basketball	1	4.0
	Frequency of Sports Activity (n =22)		
	Once a week	9	36.0
	Twice a week	14	56.0
	Thrice a week	2	8.0
Imaging Findings	**X-ray Findings**		
	Soft tissue swelling	19	76.0
	Enlarged tibial tuberosity	22	88.0
	Fragmented tibial tubercle	7	28.0
	Irregular tibial apophysis	16	64.0
	Separation of tibial tubercle	13	52.0
	Loose ossicles	2	8.0
	Calcification	8	32.0

OSD: Osgood-Schlatter Disease

Table 4. Conservative treatment modalities used in patients with OSD

Treatment Modality	Frequency	Percentage (%)
Rest	25	100.0
Anti-inflammatory drugs	22	88.0
Ice application	13	52.0
Knee taping	4	16.0
Activity modification	21	84.0
Physiotherapy	10	40.0

OSD: Osgood-Schlatter Disease

rest, ice application, activity modification, use of anti-inflammatory medications, knee bracing and taping, and physiotherapy. This aligns with the global consensus favoring non-surgical management for most cases of OSD.[16,17] Surgical intervention was not required in our patients, as it is reserved for refractory cases. This is consistent with the reports and guidelines in the literature.[3,16] However, the short follow-up duration (80% <1 year) of our cases limits assessments of long-term outcomes, emphasizing the need for extended follow-up to evaluate recurrence or complications post-skeletal maturity.

The limited epidemiological data on OSD in Nigeria contrasts with the high physical activity levels in this population. The findings of this review may likely underestimate the true burden due to underreporting and misdiagnosis in primary care settings. Improved clinician education and public health campaigns are needed to enhance early recognition and management of OSD.

Key limitations of this study include its retrospective design, small sample size, and single-center setting, which restrict generalizability. The relatively short follow-up period limits the evaluation of long-term outcomes such as residual pain or skeletal sequelae.

Despite these limitations, the study provides valuable insights into the presentation and management of OSD in a Nigerian population, addressing a knowledge gap in the local epidemiology of this condition. Future prospective studies with larger cohorts are needed to validate these findings and explore risk factors specific to the Nigerian context. Population-based prevalence studies could provide a more accurate assessment of OSD's true burden in Nigeria, while longitudinal studies tracking patients until skeletal matu-

rity would offer insights into disease recurrence and post-growth complications.

CONCLUSION

This study provides valuable insights into the demographic, clinical, radiographic, and treatment patterns of OSD among Nigerian adolescents. The findings are largely consistent with global literature, reaffirming OSD's association with adolescence, male gender, and high-impact sports. The effectiveness of conservative management underscores the importance of early recognition and timely intervention. Future research should prioritize population-based prevalence studies and longitudinal outcome assessments. Tailored prevention strategies, particularly within school sports programs, are essential to reducing the burden of OSD in Nigeria. Clinicians should maintain a high index of suspicion for OSD in adolescents presenting with anterior knee pain, especially those engaged in sports.

COMPETING INTERESTS

The authors declare that they have no competing interests

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