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Prevalence and Demographic Distribution of Schistosomal Appendicitis: A Retrospective Study in an Endemic Region

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Abstract: Schistosomal appendicitis is a unique form of appendicitis associated with Schistosoma species infections, presenting distinctive challenges in terms of epidemiology, clinical presentation, and management. This retrospective study aims to bridge the knowledge gap by investigating the prevalence of schistosomal appendicitis in comparison to other forms of appendicitis, as well as the demographic distribution of schistosomal appendicitis in relation to age and sex. The study sample consists of diagnosed records and histopathology slides of appendicectomy specimens from the University of Maiduguri Teaching Hospital (UMTH) between January 2018 and December 2022. The results indicate that schistosomal appendicitis represents a small proportion (3.8%) of appendicitis cases at UMTH, with males being more affected than females. The peak occurrence of schistosomal appendicitis was observed in individuals aged 20-29 years, highlighting the need for considering this condition in diagnosis, particularly in endemic regions. Further research is required to explore the underlying factors contributing to the occurrence of schistosomal appendicitis.

Keywords: Schistosomal appendicitis, Prevalence, Demographic distribution, Appendicitis, Endemic region. *Geometry, Performance Test.*

Introduction

Schistosomal appendicitis is a distinctive form of appendicitis characterized by inflammation of the appendix associated with Schistosoma species infections (Kapoor *et al.*, 2017; Oyetola *et al.*, 2019). While appendicitis is a well-known surgical emergency, schistosomal appendicitis presents unique challenges in terms of its epidemiology, clinical presentation, and management (Nkrumah *et al.*, 2016). Understanding the epidemiology and clinical characteristics of schistosomal appendicitis is essential for accurate diagnosis, appropriate treatment, and effective public health interventions.

The University of Maiduguri Teaching Hospital (UMTH) serves a population residing in an endemic region for schistosomiasis, making it an ideal setting the current study.

Schistosomal appendicitis poses a significant clinical and public health challenge in regions endemic for schistosomiasis (Borah *et al.,* 2018; Gyedu *et al.,* 2020). However, there is a paucity of research specifically focused on the epidemiology. This lack of knowledge hampers accurate diagnosis, optimal management, and appropriate allocation of healthcare resources.

Therefore, this retrospective scientific research aims to bridge the existing knowledge gap by investigating the prevalence of schistosomal appendicitis at UMTH in relation to other forms of appendicitis, and the demographic distribution of schistosomal appendicitis in relation to age and sex at UMTH.

Methodology

Study Design

A retrospective comparative study design was employed to investigate the frequency as well as the demographic presentation of schistosomal appendix.

Sample Collection

The study sample consisted of diagnosed records and histopathology slides of all appendicectomy specimens performed at UMTH between January 2018 and December 2022. The inclusion criteria were patients who underwent appendectomy at University of Maiduguri Teaching Hospital the during the specified time period and had a confirmed diagnosis of appendicitis.

Data Extraction

Records of age and gender were extracted from the patients' medical records and histopathology reports.

Histopathological findings: Presence or absence of granuloma ova of the Schistosoma parasite in the appendiceal tissue.

Data Analysis

The prevalence of schistosomal appendicitis was calculated by determining the proportion of cases positive for schistosomal infection among all cases of appendicitis included in the study using SPSS version 20.0 statistical package.

Ethical Considerations

This study solely involved the retrospective analysis of existing medical records and histopathology slides without direct patient interaction or the collection of identifiable information, therefore it did not require formal ethical clearance. However, the study strictly adhered to the principles of patient confidentiality and data protection, ensuring the privacy and anonymity of the individuals included in the analysis.

Results

Table 1 shows the distribution of appendicitis cases

The table indicates that out of the total 586 appendectomy cases reviewed, 22 cases (3.8%) were diagnosed with schistosomal appendicitis, while the remaining 564 cases (96.2%) were classified as other forms of appendicitis.

Table 1: Distribution of Appendicitis Cases

Appendix cases	Number	Percentage
Schistosomal appendicitis	22	3.8
Other forms of appendicitis	564	96.2
Total	586	100

Table 2: Distribution of schistosomal appendicitis cases by sex

The table indicates that out of the 22 cases of schistosomal appendicitis, 19 cases (86.4%) occurred in males, while 3 cases (13.6%) occurred in females.

			Table
Sex	Number	Percentage	3
Male	19	86.4	
Female	3	13.6	
Total	22	100	

Table 2: Distribution of Schistosomal Appendicitis Cases by Sex

Distribution of schistosomal appendicitis cases by age group

The table indicates that out of the 22 cases of schistosomal appendicitis studied, the age distribution varied across different age groups. However, the highest number of cases, 9 (40.90%), occurred in individuals aged 20-29 years, representing the peak age range for schistosomal appendicitis, while the lowest number of cases, 2 (9.10%), occurred in children aged 0-9 years.

Table 3 Distribution of Schistosomal Appendicitis Cases by Age Group

Age distribution	Number	Percentage
0-9	2	9.10
10-19	5	22.70
20-29	9	40.90
30-39	6	27.30
Total	22	100



Plate 1: photomicrograph of a normal appendix showing normal mucosal glands indicated by arrows (H & E X400)

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Plate 2: photomicrograph of an appendix showing schistosoma granuloma ova indicated by the arrows. (H&E X400)

Discussion

The results focusing on the occurrence of schistosomal appendicitis showed that among the total of 586 appendectomy cases reviewed, 22 cases (3.8%) were diagnosed with schistosomal appendicitis, while the majority of cases, 564 (96.2%), were classified as other forms of appendicitis. This finding suggests that schistosomal appendicitis represents a relatively small proportion of appendicitis cases at UMTH. The finding is a little bit higher than similar study carried out by Gali et al., (2006) in the same environment with a prevalence of 2.5%. Thus increased prevalence might be as a result of increase in the number of appendicectomy specimens received in the laboratory especially from endemic areas like Nguru in Yobe State. It may also be as a result of increase community awareness of their health and surgeons insisting on histopathological diagnosis of all appendicectomy specimens contrary to the common practice of burying the specimens by relatives. The prevalence in this study is also higher than prevalence in Japan where prevalence of 0.32 was reported (Terada, 2009), the low prevalence may be due to presence of good source of drinking water to the populace. However, similar findings to this study have been reported in a study by Rafique et al. (2020) who observed a

comparable prevalence of schistosomal appendicitis among a sample of appendicitis cases in a different Nigerian hospital. The findings also aligns with findings from another study conducted by Osime et al. (2015) in Nigeria, which reported a similar prevalence of 4.2% among appendectomy cases in a different hospital. This suggests that the prevalence of schistosomal appendicitis remains relatively consistent across different healthcare settings within Nigeria

The data generated from this study also demonstrates that higher prevalence of schistosomal appendix occurred in males, 19 cases (86.4%). This observation aligns with previous studies conducted by Gali *et al* (2006) which shows much incidence in men than women, Ellis (2012) 'that says Appendicitis tends to affect males, those in lower income group, for unknown reasons and people living in rural areas'. And Saha et al. (2017) who also reported a higher prevalence of schistosomal appendicitis in males. These findings suggest that gender may play a role in the susceptibility to schistosomal appendicitis, with males being more affected than females. The underlying reasons for this disparity could be attributed to biological, behavioral, or occupational factors, which would require further investigation.

The current study identified a peak occurrence in individuals aged 20-29 years, with 40.90% of cases falling within this age group. This finding is consistent with studies conducted by Ibrahim *et al.* (2017) in Nigeria and Abdullah et al. (2020) in Egypt, which reported a similar peak incidence of schistosomal appendicitis in young adults. These studies suggest that individuals in their twenties are particularly vulnerable to schistosomal appendicitis. However, it is important to note that even young children can be affected by schistosomal appendicitis, as evidenced by the 9.10% of cases occurring in the 0-9 years age group in the current study. This observation is in agreement with studies conducted by Elzouki *et al.* (2016) in Libya and Ahmed *et al.* (2021) in Sudan, which reported cases of schistosomal appendicitis as a potential diagnosis in pediatric patients presenting with appendicitis symptoms.

In conclusion the findings reveal that schistosomal appendicitis represents a relatively small proportion (3.8%) of appendicitis cases at UMTH, with the majority classified as other forms of appendicitis. The prevalence observed in this study is higher than previous studies conducted in the same region but consistent with similar studies conducted in other parts of Nigeria. Males were found to be more susceptible to schistosomal appendicitis, and individuals aged 20-29 years were identified as the most affected age group, although cases were also observed in children. These results highlight the importance of considering schistosomal appendicitis as a potential diagnosis, especially in endemic regions, and underscore the need for further research to explore the underlying factors contributing to its occurrence.

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