

Complicated Appendicitis in Adults: Experiences in a Tertiary Care Institution in Southern Nigeria

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ABSTRACT

Background: Appendicitis, characterised by inflammation of the appendix, is a common surgical emergency encountered worldwide, imposing a substantial burden on the healthcare system. Complicated appendicitis refers to cases where the inflammation progresses to perforation, abscess formation, or other intra-abdominal complications, often requiring more extensive surgical procedures, increased hospital stays, and heightened resource utilisation. This study aims to elucidate the factors predisposing to complicated appendicitis to create awareness, ameliorate its occurrence, and optimise patient outcomes.

Methodology: A retrospective study was conducted. Patients who had appendicectomies between January 2018 and December 2022 were included in the study. Data were collected and analysed using the Statistical Package for Social Sciences (SPSS), version 26.

Results: Out of the total of 92 participants, 45 (48.9%) were male, and 47 (51.1%) were female. The male: female ratio was 1:1.04.

The majority of patients (92.4%) were between the ages of 10-39yrs with the highest age category being 20-29 years (48.9%).

The mean duration of symptoms of patients with complicated cases was 6 days (range: 1 – 21 days). In contrast, participants with uncomplicated cases had a mean of 3 days (range: 8 hours to 8 days).

Complicated cases had an average stay of 9 days (range: 5-19 days). Participants with uncomplicated cases had a mean duration of 4 days (range: 3-7 days)

Conclusion: Complicated appendicitis exhibits distinct presentation patterns and outcomes. This study emphasises the importance of early recognition and prompt surgical intervention to reduce the morbidity and mortality associated with complicated appendicitis.

Keywords: complicated appendicitis, retrospective study, tertiary care institution, southern Nigeria, diagnostic imaging, surgical management, complications, outcomes.

INTRODUCTION

Acute appendicitis, which is inflammation of the vermiform appendix, is a common presentation in surgical units globally.¹

It is one of the most frequently encountered surgical emergencies worldwide, with an estimated lifetime risk of approximately 8.6% for men and 6.7% for women.² In Nigeria, the estimated annual incidence of appendicitis is 22.1 – 49.8 new cases per 100,000.³

The diagnosis of appendicitis is primarily based on clinical presentation, supported by imaging modalities such as ultrasound, computed tomography, and magnetic resonance imaging.⁴⁻⁷

The gold standard of treatment of acute appendicitis is laparoscopic appendicectomy, even though open appendicectomy is practiced in our setting and is typically associated with low morbidity and mortality rates.⁸⁻¹⁰ However, a delay in diagnosis or inadequate treatment can lead to the development of complicated appendicitis, which significantly increases the risks for patients and poses challenges for healthcare providers.¹¹

Complicated appendicitis refers to cases where the inflammation progresses to perforation, abscess formation, gangrenous appendix, generalised peritonitis, sepsis and even fistula formation, often requiring more extensive surgical procedures, prolonged hospital stays, and even death with attendant increased resource utilisation and cost.¹

Conversely, prompt recognition and appropriate intervention in complicated appendicitis are vital to prevent life-threatening complications and ensure favourable outcomes.¹²⁻¹⁴

The primary objective of this study is to determine the pattern of complicated appendicitis in terms of socio-demographic data, presentation patterns and postoperative outcomes in a tertiary centre in Rivers State, Nigeria.

METHODOLOGY

This was a retrospective study of all patients with histologically confirmed acute appendicitis seen at UPTH over two years (from 1st January 2018 to 31st December 2022). Relevant data, which included age, sex, symptoms and signs, duration of illness before presentation, post-operative complications, and outcome of surgery, were extracted from the folders and analysed.

Categorical variables were presented as frequencies and percentages. All analysis was done with the Statistical Package for Social Sciences (SPSS) version 26 software (IBM, USA).

RESULTS

Out of the total of 92 participants, 45 (48.9%) were male, and 47 (51.1%) were female, with a male-to-female ratio of 1: 1.04.

Table 1 presents the distribution of participants by sex. Out of 92 participants, 45 (48.9%) were male, and 47 (51.1%) were female.

Table 1: Gender distribution in participants.

GENDER	NUMBER	PERCENTAGE
MALE	45	48.9
FEMALE	47	51.1
TOTAL	92	100

The majority of patients (92.4%) were between the ages of 10-39yrs with the peak age category being 20-29 years (48.9%).

Table 2: Age distribution in study participants

AGE	NO OF PATIENTS	PERCENTAGE
10-19YEARS	15	16.3
20-29YEARS	45	48.9
30-39YEARS	25	27.2
40-49YEARS	5	5.4
50-59YEARS	2	2.2
>59	0	0
TOTAL	92	100

Table 3 illustrates the distribution of participants by level of education. Among the participants, 6 (46.2%) in the primary education category, 4 (30.8%) in the secondary education category, and 3 (23.1%) in the tertiary education category had experienced complications related to the medical condition.

Table 3: Level of education

Level of education	Complicated cases		Uncomplicated cases	
	Number	%	Number	%
Primary	6	46.2	49	62.0
Secondary	4	30.8	20	25.3
Tertiary	3	23.1	10	12.7
Total	13	100	79	100

The duration of symptoms is presented in Table 4. The range of symptom duration for participants with complicated cases varied from 1 day to 21 days, with a mean duration of 6 days. In contrast, participants with uncomplicated cases had symptom durations ranging from 8 hours to 8 days, with a mean duration of 3 days.

Table 4: Duration of symptoms

			Complicated	Uncomplicated
Duration of symptoms (range)			1 day- 21 days	8 hrs- 8 days
Duration of symptoms (mean)			6 days	3 days

Table 5 displays the duration of hospital stay for participants. Those with complicated cases had hospital stays ranging from 5 to 19 days, with an average stay of 9 days. Participants with uncomplicated cases had shorter stays, ranging from 3 to 7 days, with a mean duration of 4 days.

Table 5: Duration of hospital stay

	Complicated	Uncomplicated
Duration of hospital stay (range)	5-19 days	3-7 days
Duration of hospital stay (mean)	9 days	4 days

The incidence of complications is summarised in Table 6. Wound infection was the most common complication, with 12 cases reported among participants with complicated cases, compared to 3 cases among those with uncomplicated cases. One case of intra-abdominal abscess was reported in the complicated cases group, while no such cases were reported among participants with uncomplicated cases.

Table 6: Incidence of complications

Incidence of complications	Complicated	Uncomplicated
Wound infection	12	3
Intra-abdominal abscess	1	0
Number of complications	13	3

DISCUSSION

The majority of patients (92.4%) were between the ages of 10- 39 years, with the highest age category being 20-29 years (48.9%) which is in keeping with the findings of researchers in northern Nigeria;¹⁵ revealing that appendicitis is common in the second and third decade of life, as also discovered by Alatise et al.¹⁶ Appendicitis as a disease of the young is also supported by studies in other parts of the world.¹⁷⁻¹⁹

The findings revealed that individuals with primary education comprised the largest group with complicated cases (46.2%), followed by those with secondary education (30.8%) and tertiary education (23.1%). Interestingly, the distribution differed for uncomplicated cases, with a higher proportion of individuals with primary education (62.0%) compared to secondary (25.3%) and tertiary education (12.7%). This implies that individuals with lower levels of education are at a higher risk of experiencing poverty and ignorance, which could result in delays in seeking medical attention. Consequently, they may face a greater vulnerability to developing complications associated with acute appendicitis.²⁰

This study showed that the mean duration of symptoms for complicated appendicitis was 6 days while that of uncomplicated appendicitis was 3 days. This delay of symptoms can be attributed to the delayed presentation as a result of poverty, ignorance and proximity to a healthcare facility.²¹⁻²³ Previous studies have demonstrated that an extended duration of symptoms increases the predisposition to complications associated with appendicitis.²⁴⁻²⁶

Those with complicated cases had an average hospital stay of 9 days, while patients with uncomplicated cases had shorter stays, with a mean duration of 4 days which is similar to a study done in South Korea which had a mean duration of hospital stay of 7.5 days for complicated cases and 4.25 days for uncomplicated cases.²⁷

Complicated appendicitis was found in 14 % of patients in our study.

Factors predisposing to this may be attributed to delayed presentation, prolonged stay in hospital before diagnosis and intervention, delay in diagnosis or misdiagnosis and failure to accept treatment as noted by Dodiya et al.²⁸ and researchers from other parts of the world.²⁹⁻³¹

The incidence of complications among the study participants revealed some noteworthy patterns. Wound infection was the most common complication reported, with a higher frequency among individuals with complicated cases compared to uncomplicated cases. Njoku et al. also found wound infections as the commonest complication of complicated appendicitis in Benin, Nigeria.²⁰ In a study conducted in Maiduguri, Nigeria, researchers discovered that wound infection rates accounted for the commonest complications arising from acute appendicitis, amounting to approximately 28.3%.¹⁵ This finding is consistent with previous research carried out by Ming et al. in Bangladesh, indicating that complicated cases are more prone to surgical site infections.³² Additionally, we observed a single case of intra-abdominal abscess among participants with complicated cases, suggesting the potential for postoperative complications in this subgroup.

CONCLUSION

This study highlights the distinct presentation patterns and outcomes of complicated appendicitis in a tertiary care institution in Southern Nigeria. The findings reveal that delayed symptom duration, lower educational attainment, and prolonged hospital stays are significant factors associated with complicated cases. The majority of patients were young adults, with wound infection being the most common postoperative complication. Early recognition and prompt surgical intervention are critical to reducing morbidity and mortality, emphasising the need for improved healthcare access and patient education to mitigate delays in seeking treatment.

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