

The Clinical Relevance of Diarrhoea in Patients with Suspected Uncomplicated Appendicitis

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Background: Diarrhea is uncommon in uncomplicated appendicitis and when present, it tends to bring about delay in diagnosis, thus predisposing to complications.

Methods: This was a retrospective study of all cases of uncomplicated appendicitis seen at LAUTECH Teaching Hospital, Osogbo, Nigeria over a 3 year period.

Results: During the period under review, 153 with uncomplicated appendicitis were seen. Their ages ranged from 4 to 62 years with a median of 23.01 years. The M: F ratio was 1.15: 1. Diarrhea was more common in patients aged under 15 years ($p = 0.003$). Fifteen (9.8%) of the patients had diarrhea and was more common in females (12.67%) than in males (7.31%) ($p = 0.201$). Diarrhea was present in 4.34% and in 18.03% patients presenting before and after 72 hours respectively ($p = 0.006$). Fever ($T > 38^{\circ}\text{C}$) was found in 91 patients, 11 of them had diarrhoea, compared to 4 of the 62 without fever ($p = 0.283$ Fisher's exact test). There was no significant difference in rectal findings in patients with or without diarrhea ($p = 1.000$). The unsuspected perforation rate was 66.6% for those with diarrhoea and 0.7% for those without diarrhea ($p < 0.000$, odds ratio of 274). About 22% and 5.3% of patients with and without pus collection respectively had diarrhea ($p = 0.0049$, O R 5.18). Diarrhea was significantly more associated with appendiceal perforation compared with simple appendicitis ($p = 0.00001$ odds ratio 77.5) and also compared with those with normal appendix ($p = 0.006$). The median length of hospital stay was significantly higher in patients with diarrhea ($p = 0.001$)

Conclusion: Diarrhea as a symptom of appendicitis is commoner in children. It is associated with late presentation, more perforation, intra-bdominal pus and prolonged length of stay

Key words: clinical relevance, diarrhea, appendicitis

Introduction

Acute appendicitis is common all over the world, more common in the second and third decade of life¹. Diarrhea is not a common symptom in patients with appendicitis². when it occurs in the presence of other typical symptom complex that suggest acute uncomplicated appendicitis it may signify the likely locations of the tip of the appendix., outside of this, if it develops as a later symptom, it has been found to be associated with increased morbidity and prolonged hospital stay.²

The typical symptoms of appendicitis are central abdominal pain shifting to the right lower abdomen, anorexia, nausea with or without vomiting and later low grade fever of temperature less than 38°C . Because diarrhea is not a common presentation in patients with acute uncomplicated appendicitis, its presence often confuses the clinician leading to an initial diagnosis of gastroenteritis especially in children thus delaying proper treatment. This predisposes the patient to complications like perforation, intra-abdominal abscess, septicaemia and even increased mortality.³ As earlier noted, diarrhea could occasionally be part of the primary symptom complex of uncomplicated inflamed appendix in patients with pelvic or retro-caecal appendix⁴ or in patients with regional enteric inflammation caused by organism like Salmonella species⁵ or Yersinia species⁶ or when appendicitis occur in association with viraemia. The latter occur more in children.

Two consecutive cases of appendicitis misdiagnosed as enteritis because of associated diarrhea and vomiting, leading to delayed surgical intervention prompted us to review all cases with clinical diagnosis of uncomplicated appendicitis in relation to presence or absence of diarrhea as a presenting symptom.

The aim of this study was to determine the association between the presence of diarrhea, late presentation and outcome of treatment in patients that were diagnosed clinically as uncomplicated acute appendicitis.

Patients and Methods

All available records of patients diagnosed and managed for appendiceal pathology over a 3 year period, Jan 2007 through Dec 2009, at LTH, Osogbo, Nigeria were reviewed. Information about the demographic data, the primary symptom complex, intra-operative findings, length of hospital stay and presence of complications were obtained. Patients with provisional clinical diagnosis other than uncomplicated acute appendicitis were excluded, including those with clinical provisional diagnosis of ruptured or perforated appendicitis. The patients with provisional clinical diagnosis of ruptured appendix were excluded because from the records it was difficult to determine whether or not the presence of diarrhea preceded the overt symptoms and signs that suggest rupture or perforation of the appendix.

Results are presented in descriptive statistics, Proportions are compared using Fisher's exact test and level of significance was set at p-value of less than 0.05.

Results

During the period under study, one hundred and fifty-three patients were seen with appendicitis. Their ages ranging from 4 to 62 years (median- 23.01 yrs). Eighty-two were males (M: F 1.15 : 1). Fifteen patients (9.8%) had diarrhea; 9 of 71 females (12.67%) and 6 of 82 males (7.31%) ($p = 0.266$). Diarrhea was more common in patients below 15 years $p = 0.003$ (figure 1). Diarrhea was also found in 4 out of 92 (4.34%) and 11 of 61 (18.03%) patients presenting before and after 72 hours from the onset of symptoms ($p = 0.006$ Fisher's exact test).

Fever with temperature above 38°C was found in 91 patients, 11 of them had diarrhea (12.08%), compared 4 of the 62 (6.45%) without fever ($p = 0.283$ Fisher's exact test). A total of 121 patients had digital rectal examination findings recorded out of the 153 available records; rectal tenderness was found in 1 of the 10 with diarrhea and 9 of the 110 without diarrhea ($p = 1.000$ Fisher's exact Test).

Ten (90%) of the 11 patients with clinically unsuspected perforation or rupture had diarrhea as part of their symptoms. The perforation rate was 66.6% and 0.7% for those with and without diarrhea respectively, with an odds ratio of 274 (see table 1). Excess peritoneal fluid was found in the right iliac fossa of 9% and 10% of patients with and without diarrhea respectively ($p = 0.944$), whereas 22.5% (9/40) and 5.3% (6/113) with and without diarrhoea respectively had pus collection in the right iliac fossa ($p = 0.0049$). The odds ratio of presence of pus in patients with diarrhoea and those without diarrhoea was 5.18.

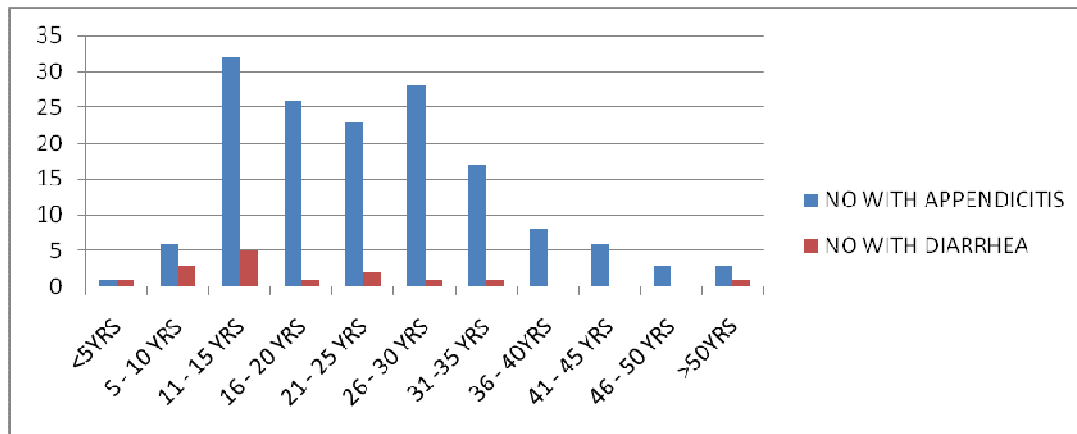


Figure 3 Age Distribution of 153 Patients with Acute Appendicitis and Corresponding Number with

Eleven patients had histologic diagnosis of normal appendix, 128 has histologic confirmation of inflammation of the appendix while 14 had histologic confirmation of perforation. Diarrhoea was more common in those with perforation. ($p = 0.00001$ Fisher exact test), the odds ratio was 77.5 (Table 2),. Electrolyte derangement was not documented in any of the patients. Diarrhoea.

Table 1. Incidence of Diarrhoea in Patients With Appendiceal Perforation

Condition	Diarrhea	No Diarrhea
Perforation	10	1
No Perforation	5	137
Odds ratio : 274		

Table 2. Distribution of Final Diagnosis in Patients with or without Diarrhoea

Diarrhoea	Normal Appendix	Inflamed Appendix	Perforated Appendix	Total
Present	1	4	10	15
Absent	10	124	4	138
	11	128	14	153

The median length of hospital stay in patients with diarrhea was 6 days (range 5 - 9 days) and 2 days (2 - 4 days) in those without ($p = 0.001$). Wound infections occurred in 3 patients, all 3 had appendiceal perforation. Prolong paralytic ileus was seen in one with diarrhea and appendiceal perforation.

Discussion

Myers in 1924 reported the case of a child who presented with diarrhea and convulsions along with right iliac fossa pain in a 6 year old boy; all symptoms resolved after appendectomy.⁷ Significant diarrhea is not a typical symptom of appendicitis. Only about 10% of patients with appendicitis were found to have diarrhea in this study. Though only 7 patients were below the age of ten years in the present study but 4 of them had diarrhea as a symptom. Children makes the age group of patients with appendicitis commonly associated with diarrhea, though appendicitis is less common in them compared to those in the second and third decades of life.^{2, 8} Higher percentage of patient with diarrhea was found in females, though not statistically significant. Reynolds SL in his study on missed appendicitis in a pediatric emergency department suggested that this may be due to delayed diagnosis

in them as a result of possible multiple differential diagnosis usually entertained before correct diagnosis can be made⁹.

Diarrhea is an important factor that confuses diagnosis², it was found to be a significant symptom in patients presenting after 72 hours in this study. It can be a late manifestation of appendicitis or may result from complications like perforation in patients presenting lately^{2, 10, 11}. Fever when seen is usually less than 38°C in patients with uncomplicated appendicitis. In this study, temperature above 38°C was seen in a higher proportion of patients with diarrhea, though this proportion was not statistically significant. We agree that temperature above 38°C should prompt the surgeon to think of a possibility of complications like abscess or perforation as previously documented¹¹⁻¹³.

In an environment with preponderance of faeco-oral transmission of infection, typhoid enteritis and other causes of gastrointestinal inflammation are close differential diagnosis in patient with acute appendicitis. The clinical diagnostic dilemma will continue and may even be on the increase with increasing incidence of appendicitis^{1, 14}. Hence every clinical information accrued in the course of interaction with the patient become significant in reaching a decision. This is why it is particularly interesting to state that our study showed that in the presence of clinical features suggestive of uncomplicated appendicitis, if diarrhea is present, the odds of rupture of the appendix is 2.5. The diarrhoea may be due to abscess collection in the pelvis and or retrocaecal region causing rectal or colonic irritation. This patient that have diarrhoea usually present with frequent passage of scanty amount of stool with or without mucus². This differs from the diarrhoea manifestation in viral gastroenteritis especially in children where the instance, the diarrhea is profuse and the patient also manifests some symptoms of upper respiratory infection.

Though not a specific finding in patients with appendicitis¹⁵, it is surprising that rectal tenderness was not found in most of our patients with perforation or diarrhea and intra-peritoneal collection. Boggiess of the recto-vesical pouch is a normal finding in patient with significant pelvic abscess. Patients with appendicitis and intra-peritoneal pus are likely to have developed this from delayed diagnosis giving room for perforation and supuration.

The increased length of hospital stay in these patients emanated from the diagnostic delay and longer duration of post-operative care^{2,3}. The patients are usually more toxic and in hyper catabolic state thus causing delayed recovery requiring longer period of hospital admission to provide adequate therapeutic antibiotics plus other supportive therapies and observe for complications. Complications like perforation, intra-abdominal abscess, wound infection, septicemia, shock and even death are commoner in patients with neglected appendicitis, unlike those with uncomplicated appendicitis that can be diagnosed easily and discharge within 48 hours after operation.

Abdominal ultrasound has been found a useful imaging technique in making early diagnosis in face of diagnostic confusion^{16, 17}. Early surgical assessment and evaluation with ultrasound in patients with abdominal pains with or without diarrhea will go a long way in making early diagnosis before complications occur. Thus reducing morbidity mortality and length of hospital stay.

Conclusion

Presence of diarrhea as a symptom in patient with appendicitis is more common in children, It is associated with late presentation, more incidence of perforation or rupture and pus collection. It is also a risk for prolonged length of hospital stay.

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