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Clinical Presentation of Acute Appendicitis in Adults at Government General Hospital, Vijayawada

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Abstract: ***Background: Acute appendicitis is the most common surgical abdominal emergency. Delayed treatment increases the incidence of complications. The aim of this study was to investigate the presentation, incidence, and predictors of complications, and histological findings in adult patients with clinical diagnosis of acute appendicitis. Methods: The study was a prospective observational study and included patients aged 12 years and older diagnosed with acute appendicitis. Data collected included demographic data, clinical presentation, duration of symptoms and reasons for presentation delay, diagnostic investigations, operative and histology findings, length of hospital stay, and mortality. Results: A total of 146 patients were admitted with a mean age of 26 years (SD=12Years). The male to female ratio was 1.6:1. Predominant presenting symptoms were right iliac fossa pain (95%), nausea (80%), and vomiting (73%), with 63% of patients presenting 2 days after onset of symptoms. Fever was present in 15% and only 31% of patients gave a typical history of acute appendicitis of vague peri-umbilical pain. The negative predictive values of white cell count and C-reactive protein for acute appendicitis were 28% and 50%, respectively. Sensitivity of the ultrasound to detect acute appendicitis was 60% with a negative predictive value of 31%; 30% of patients had complicated appendicitis. Histology results showed a normal appendix in 11% ofpatients.The30-day mortality rate was 1.4%. Conclusions: Patients with acute appendicitis rarely present with a typical history of vague peri-umbilical pain. The negative predictive values of both white cell count and ultrasound proved that neither of these measurements was accurate in the diagnosis of acute appendicitis. Most of our patients with complicated disease present late, with the most common reasons for this delay being lack of access to a medical clinics and prior treatment by general practitioners. Complications were higher in males and in those aged 45years and above.***

Keywords: Acute appendicitis; Complications; Delayed presentation; Negative appendicectomy

1. Background

Appendicectomy is the most common emergency surgical procedure worldwide. About 8% of people in Westerncountries will have appendicitis during their life time, and the incidence in the UK is about 52 per 100,000 population. However, in South Africa, the incidence is estimatedto be less than 9 per 100,000. The peak incidence of acute appendicitis is between 10 and 30 years of age.

The diagnosis of acute appendicitis is mainly clinicaland presentation of acute appendicitis may be typical or a typical. Typical presentation starts with vague per umbilical pain for several hours, which later migrates tothe right iliac fossa (RIF), associated with lack of appetite, nausea, or vomiting. Atypical histories lack this typical progression and may include pain in the right lower quadrant as an initial symptom.

If left untreated, acute appendicitis may lead to complications, leading to inflammatory mass, appendix abscess, or rupture, with generalized peritonitis. Diagnosis of complicated acute appendicitisis clinically supplemented by ultrasound or CT scan. However, it is common inpractice to admit and observe patients with an uncertain diagnosis and to delay their surgery until the diagnosis ismore definite in order to reduce the negative appendicectomy rate.

Pre-admission delay on the part of the patientand post-admission delay by the surgeon is responsiblefor combined delay in diagnosis and definitive management.

2. Methods

This was a prospective observational study of patients12 years and older (as 12 years is a lower age cut-off foradmission), diagnosed and treated for acute appendicitis at Government General Hospital, Vijayawada from April 1st 2020 to September 31st 2020.

Patients' files were reviewed on admission and after discharge. Data retrieved included patients' demographics, clinical presentation, and duration of symptoms before presentation to the hospital, results of diagnostic investigations and evidence of complicated disease at presentation, length of hospital stay, intensive care unit (ICU) admission, negative appendicectomy, and mortality rate.

Sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) of diagnostic investigations were calculated. An Excel sheet was used for data collection and Statistic was used for statistical analysis.

Permission to conduct the study was received from the Human Ethics Committee of the GGH, VIJAYAWADA...

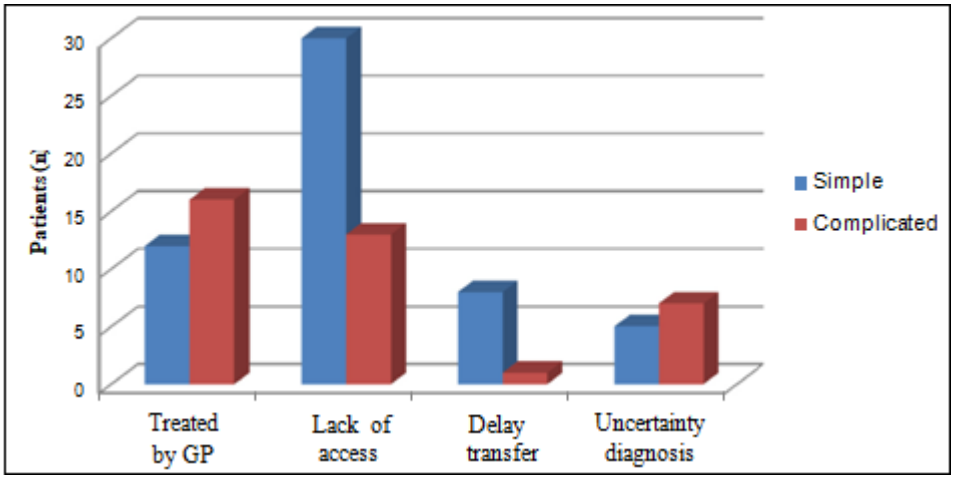

Figure 1: Reasons for delays compared to the occurrence of complicated appendicitis

3. Results

A total of 146 patients were diagnosed with acute appendicitis. The male to female ratio was 1.6:1 and their mean age was 26 years (SD=12years).The duration of symptoms was 4.5 days (SD = 4 days) and 63% of the patients presented more than two days after the onset of symptoms. Overall, the complicated appendicitis rate was 30%, with the most common reason for delay in presentation being a lack of access to hospitals or clinics and to information (29%), and prior treatment by general practitioners (19%). Common presenting symptoms were RIF's pain (95%), vomiting (73%), and 31% had a typical acute appendicitis presentation and 80% had nausea.

The following investigations were under taken: white cell count (WCC) in 95%, C-reactive protein (CRP) in89%, abdominal ultrasound in 40%, CT scan in 6%, and diagnostic laparoscopy in 7% of the146 patients included in this study. The median WCC and CRP were11.5 (8.7–15.4) and 80.5 (30.3–171.3), respectively. Thesensitivity, specificity, PPV, and NPV percentages of all investigations were as illustrated in Table 4.

The majority of our patients (89%, 131/146) were operated on soon after admission. Histology resultsshowed perforated appendix with or without generalized peritonitis in 41 patients (29%) and normal appendix in11% ofcases.

The mortality rate was 1.37% (2/146); patients who died were above 45 years of age, with co morbidities and having had more than two re-operations. There was a statistically significant difference in duration of symptoms, length of ICU and hospital stay, re-operation, and mortality in patients with complicated appendicitis when com-pared to uncomplicated appendicitis.

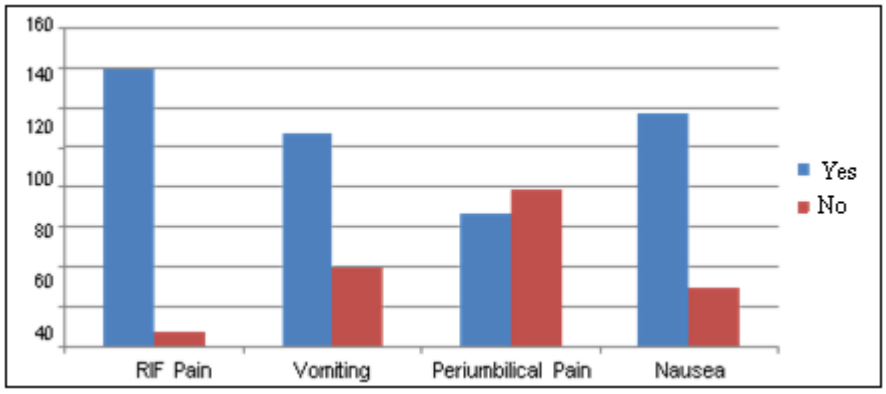

Figure 2: Signs and Symptoms

4. Discussion

Our study involved 146 patients out of a total of 3,994 patients admitted during a six-month period to the Department of Surgery at GGH, VIJAYAWADA. Signs and symptoms of acute appendicitis were dominated by abdominal pain felt in the RIF in 95% of patients, vomiting in 73%, and nausea in 80%, while the typical clinical presentation as described in the standard textbooks was found in 31% of the 146 studied patients. The overall complicated appendicitis rate was 31%. We estimate the current average in our hospital at 25cases per month. In the literature, the peak incidence of acute appendicitis worldwide is between 10 and 30 years of age. In agreement with this, our study shows that acute appendicitisis common in young adults with an average age of 26 years (SD = 12 years); 62%(91/146) of patients included in our study were male, which confirms previous findings that 67% (143/212) and 33% (69/212) of patients presented with acute appendicitis to GGH were male and female, respectively. Indeed, our study shows a statistically significant difference in the occurrence of complicated appendicitis regarding

gender. Most importantly, this finding further confirms the predominance of acute appendicitis in young males.

The average duration of symptoms in our study was 4.5 ± 4 days. Compared to other studies, the average duration of symptoms before seeking medical attention washigh, which might explain the heightened rate of complicated appendicitis found in our study. Importantly, our study confirms a statistically significant difference in patients with un-complicated and complicated appendicitis after two days of symptoms (P<0.001). Indeed, our finding is in agreement with various studies showing that the rate of complicated appendicitis increased two days after onset of symptoms. {Hayden et al. reported the risk of perforation at 70% after 48 hours of symptom onset [14].Elder et al. showed that the risk of perforation is minimal before 36 hours after onset of symptoms, but increases thereafter}.

The present study included all the standard different investigations required in the diagnosis of acute appendicitis cases. We found the inflammatory marker, CRP, sensitive in up to 92% of cases and WCC in 48%, withNPVs of CRP and WCC being 50% and 28%, respectively. Ahmad et al. found the CRP sensitivity to be 93%and the specificity 86%, while the total leukocyte counthad a NPV of 50% and CRP had a NPV of 50%. Bearing in mind that ultrasound is operator-dependent, we found sensitivity to be 60 %, specificity 66%, PPV 86.9%, and NPV 31%. In contrast, Al-Ajerami found an ultrasound sensitivity of 84.8% and a specificity of 83.3%, with a PPV and aNPV of 93.3% and 66.7%, respectively. In general, ultrasound seems to have better PPV than NVP. Our study shows, as many previous studies have shown, that CT scanning is the best method of investigation to confirm or to invalidate the diagnosis of appendicitis.

Our study shows that 63% of patients presented with delays, with the major reason for delay being lack of disease awareness and health facilities. Of those who presented late, 30% had self medicated;19% of delayed presentations had been treated previously by general practitioners and most of them treated conservatively with antibiotics and analgesics. Thirty percent of acute appendicitis cases in our study were complicated and found the rate of perforation is 22%.

Our study shows that outcome strongly depends on the presentation of acute appendicitis (uncomplicated or complicated), the age at presentation, the duration of symptoms, re-operations, and ICU stays of more than two days, and that hospital stays of longer than two days in complicated appendicitis were significant compared to cases of uncomplicated appendicitis. This was also found in other studies which assessed the outcome in cases of acute appendicitis. In our study, the over-all mortality rate is 2/146 (1.37%); patients who died wereabove 45 years of age. Our mortality rate was acceptablecompared to acceptable mortality rate of <1%.

Furthermore, our study shows that elderly patients who contract acute appendicitis have an atypical clinical presentation, most often with associated co-morbidities such as diabetes and hypertension. For this reason, the elderly patient requires particular attention: the correct diagnosis to be made as soon as possible and accurate investigations being essential if there is any doubt in the diagnosis of possible appendicitis.

5. Conclusions

Patients with acute appendicitis rarely present with a typical history of vague periumbilical pain. Leukocyte countis not reliable in the diagnosis of acute appendicitis. Most of our patients present late, with complicated diseases, and the most common reason for delay in presentationbeing a lack of disease awareness and/or health facilitiesand prior treatment by general practitioners. Complications were higher in males and the elderly.

Table 1: Results of Clinical Findings and Diagnostic Investigations in all Patients

Investigations	Sensitivity%	Specificity%	PPV%	NPV%
Fever (N=146)	18	83	95	5
WCC (N=139)	48	75	84	28
CRP(N=135)	92.5	24	80	50
USG (N=60)	60	66	89	31
CT Scan (N=6)	100	100	100	100

Table 2: Histological Findings

Histology Findings	Number (%)
Perforated Appendix / Generalised Peritonitis	41(28.7)
Gangrenous Appendicitis	9(6.6)
Inflamed Appendix	38(26)
Normal Appendix	16(10.9)
Missing	42(28.7)

Table 3: Comparison of Complicated and Uncomplicated Appendicitis

Parameter	Uncomplicated Number (%)	Complicated Number (%)	P Value
Male	56(55.45)	35(77.78)	0.01
Female	45(44.55)	10(22.22)	
AVERAGE ±SD	26±12	25±13	0.791
Duration Of Symptoms			
<2 DAYS	39(38.61)	2(4.44)	<0.001
>2 DAYS	62(61.39)	43(65.56)	
Previous GP Treatment	12(42.86)	16(57.14)	<0.001
Temperature			
<37.5°C	87(70.16)	8(36.36)	0.514
>37.5°C	14(63.64)	8(36.36)	
WCC			
$<12x10^9$/L	49(35)	25(18)	0.102
$>12x10^9$/L	39(28)	25(18)	
CRP			
<10MG/L	13(14)	1(3)	0.06
>10MG/L	79(86)	36(97)	
ICU Admission			
<2 DAYS	5(4.95)	9(20)	<0.001
> 2 DAYS	1(0.99)	11(24.44)	
Hospital Stay			
<2 Days	39(38.61)	2(44.44)	<0.001
>2 Days	62(61.39)	43(95.56)	
Mortality	0(0.00)	2(1.37)	<0.001

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