Original Research Article

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Negative laparotomy rates in acute abdomen: a declining trend

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ABSTRACT

Background: A prospective observational study of 105 operated cases of non-traumatic acute abdomen in emergency setting in tertiary government hospital was carried out. The correlation between preoperative diagnostic, radiological and clinical assessment and operative findings was noted. The clinical and radiological diagnostic accuracy rates were calculated using descriptive statistical analysis. Negative laparotomy rates were calculated and compared to the previous studies.

Methods: The most common finding was acute appendicitis and the most frequently involved age group was 21-40. The absence of correlation between preoperative diagnosis and operative findings was noted in 7 cases of which 2 cases of appendicitis had been missed on ultrasound and 2 cases of appendicular mass were reported as acute appendicitis where appendectomy could not be done on account of adhesions. 2 cases of x-ray diagnosed obstruction with clinical features of vomiting ,constipation had no gross bowel pathology on laparotomy while one case diagnosed preoperatively as appendicitis turned out to be a case of renal colic with hydroureter.

Results: The diagnostic accuracy rate of x-ray and ultrasound for obstruction/perforation and acute appendicitis were found to be 89.79% and 94.64% respectively.

Conclusions: The negative laparotomy rates were low around 2.85%.

Keywords: Acute abdomen, Negative laparotomy, Operative finding

INTRODUCTION

The acute abdomen is one of the commonest causes of admission to the emergency surgical department. Acute abdomen is a condition of acute abdominal pain, vomiting and bowel complaints of less than 24 hour duration where it becomes mandatory for the treating physician to establish correct diagnosis and perform urgent surgery if the diagnosis is of operative cause. The correct interpretation of abdominal pain is one of the most challenging demand to any surgeon. It is of utmost importance to integrate the results of diagnostic investigations with the clinical findings in order to establish the diagnosis. 2-4

METHODS

The data collection was done from 105 cases of non-traumatic acute abdomen adult patients admitted to the emergency surgery department of the tertiary hospital and subsequently operated. The observations were tabulated and inferences drawn.

Inclusion criteria

- Operated patients 13-80 age group acute abdomen cases
- Operated non-traumatic acute abdomen cases.

Exclusion criteria

- Pediatric age group
- Cases of trauma and gynecological cases
- Cases managed conservatively.

Data of 105 patients who underwent laparotomy for non-traumatic acute abdomen in age group 13-80 was collected. The patients underwent thorough clinical examination by the surgery postgraduates, the senior resident and also an experienced senior duty surgeon whose role was pivotal in making the final decision to operate the cases. Few basic laboratory investigations, x-ray, ultrasound and clinical findings were integrated to come to a surgical decision. The correlation was studied between the pre-operative diagnosis and the operative findings.

The accuracy of ultrasound to diagnose appendicitis and of x-ray to diagnose obstruction and perforation was studied. Descriptive statistics was used to analyze the data and obtain the percentages. The statistical analysis was done using statistical software and p-value was calculated using chi square test.

RESULTS

The incidence of operated cases of non-traumatic acute abdomen was higher among males (67.6%) as compared to females (32.38%) (Figure 1). These rates are comparable to other studies.⁵

Appendicitis was of maximum occurrence in all the cases of acute abdomen with 91.8% cases prevalent in 13-40 age groups. (Figure 2). This is similar to the observation in most studies reported in literature. ^{5,6}

The occurrence of cases of perforation and obstruction was 26.66% and 26.66% respectively with maximum incidences of each found in age group 41-60 and 21-40 respectively (Table 1). The operated cases of perforation showed male preponderance (26/28).

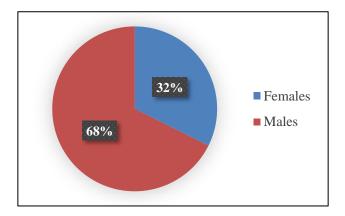


Figure 1: Percentage of operative cases in males and females.

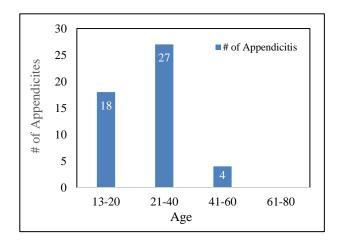


Figure 2: Age related cases of appendicitis.

Table 1: Percent occurrence of different pathologies.

Case occurrence	Appendicitis	Perforation	Obstruction
% of cases	46.66 %	26.66 %	26.66 %
Max cases in age group (years)	21-40	41-60	21-40

Table 2: Accuracy of appendicitis diagnosis.

Total number of appendicitis	USG diagnosed appendicitis		Clinically diagnosed
	Correct diagnosis	Incorrect diagnosis	Clinically diagnosed
49	44	Hydroureter Appendicular mass	2

The diagnostic accuracy of ultrasound in cases of acute appendicitis was in 44/49 cases i.e. 89.79% (Table 2). 1 case of hydro ureter was reported on ultrasound as appendicitis; 2 cases of appendicular mass were reported as acute appendicitis where surgery was limited to observation of the mass and closure of abdomen. 2 cases

of minimal free fluid abdomen; probe tenderness of right iliac fossa of abdomen were found to have acute appendicitis on surgery. In these 2 cases the decision to operate was made on the clinical findings. The X-ray accuracy rate in cases of perforation; obstruction was 53/56 (94.64%). One case of perforation had been missed

on X-ray and 2 cases of obstruction on X-ray did not have positive laparotomy findings. The diagnostic accuracy rate of X-ray and ultrasound for obstruction/perforation and acute appendicitis were found to be 89.79% and 94.64% which were higher compared to other comparable study which showed lower accuracy rates of 72.86% and 75.6% respectively.²

It was also noted that the diagnostic accuracy of radiological investigations was high around 90 to 95% leading to low negative laparotomy rates. In 2 cases clinical and X-ray obstruction features diagnosed obstruction but the bowel was found to be normal and in 1 case of appendicitis where ultrasound reported appendicitis and operative finding was of hydro ureter. The cases of negative laparotomy were 3/105 (2.8571%). This rate is quite low compared to the reported rates in literature around 17%, 14% and 12.2% in the older studies with a range from 7% to 22%. ^{1,3,4} This is probably because thorough clinical evaluation was done repeatedly by the postgraduates; the senior residents and the experienced surgeon. Evaluation by an experienced surgeon definitely adds to better clinical decision and decreases the negative laparotomy rates. A higher radiological accuracy rate also adds to decrease negative laparotomy rates. Similar lower negative laparotomy rate has also been reported in recent study (2.4%) conducted in Rohtak, Haryana published in 2015 depicting a declining trend in negative laparotomy rates in the recent past. The clinical accuracy rate was 100/105 (95.23%). There was absence of correlation between radiological and clinical findings in 7/105 cases. The diagnostic accuracy was 98/105 (93.33%). 44/49 in appendicitis; 24/26 in obstruction and 25/26 in perforation.

DISCUSSION

The successful management of acute abdomen is dependent strongly on differentiating correctly between the operative and non-operative cases. The correct interpretation of abdominal pain is one of the most challenging demands to any surgeon.¹ For the accurate diagnosis, correlation is required between clinical and radiologic findings. The correct preoperative diagnosis is quintessential to decrease patient morbidity related to unnecessary surgeries. In our study, thorough clinical judgment was followed by few basic laboratory and radiological investigations. The study showed negative laparotomy rate of 2.8571% which is comparable to recent similar studies (2015) 2.4%. These rates are much less compared to the rates reported in literature of around 13 to 17%.^{3,4} Appendicitis was the commonest cause of emergency surgery in our study, this finding being consistent with other similar studies. 5,6 This study reflects a decreasing trend in negative laparotomy rates in emergency surgery cases. It shows the importance of good clinical judgement and improved radiologic diagnostics in reducing morbidity related to unnecessary surgery procedures.

CONCLUSION

Clinical Evaluation supplemented by radiological investigations help to make the operative decision in acute abdomen. The higher the radiological and clinical accuracy rates; lesser the negative laparotomy rates. Experience of the evaluating surgeon with correct collaboration between clinical and the radiological findings adds to lower the negative laparotomy rates and hence lowers patient morbidity related to unnecessary surgeries. In (2/49) (4.081%) cases of appendicular mass, both the clinical examination and preoperative ultrasound missed the mass as does the clinical examination leading to unnecessary laparotomy. A definitive diagnosis of appendicular mass formation is sometimes missed on ultrasound. The clinical and radiological accuracy rates in our study are higher and negative laparotomy rate is lower compared to other previous studies. The negative laparotomy rates show a decline in our study and another recent study around 3% as compared to some previous studies about a decade old showing negative laparotomy rates of around 17-22%. This reflects improved surgical patient management in recent times with decrease in morbidity related to error in diagnosis and unnecessary surgery.

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institutional ethics committee

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