



ORIGINAL RESEARCH PAPER

General Surgery

STUDY TO ASSESS THE OUTCOME OF TIME GAP BETWEEN ONSET OF SYMPTOMS AND SURGERY IN CASES OF ACUTE APPENDICITIS AT TERTIARY CARE HOSPITAL

KEY WORDS: Acute appendicitis, Delayed Appendectomy

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ABSTRACT	Aim: Acute appendicitis is the most common surgical emergency. Though few studies have correlated the delay in treatment with the incidence of complications. This study is aimed at quantifying the delay to definitive care of acute appendicitis and it also makes an attempt at understanding the reasons for delay.
	Methods: This prospective observational study was performed at Tertiary level hospital with total 153 patients and 2 years durations.
	Results: Out of 153 patients, 28 (18.30%) patients presented within 12 hours, 52 (33.99%) patients presented within 12-18 hours, 37 (24.18%) presented in 19-24 hours and 36 (23.53%) patients presented after a delay of more than 24 hours.
	Conclusion and Recommendation: The pre-hospital delay forms the predominant part of total delay in treatment, Delay caused by the use of imaging in cases of acute appendicitis is not associated with complicated appendicitis so we recommended that patients should be worked up adequately preoperatively in order to reduce incidence of negative appendectomy.

INTRODUCTION

Acute appendicitis is the most common surgical emergency worldwide with life time risk of 8.6% in males and 6.7% in females. The risk is slightly higher in men and the peak incidence occurs in 2nd and 3rd decade of life¹.

Acute appendicitis was first identified in 1886 by Fitz and he recommended early appendectomy as the treatment of acute appendicitis. Since then emergency appendectomy has been accepted as the standard of care².

Despite the experience of more than 130 years, the surgeons have not been able to decide whether delay in appendectomy affects the progression of appendicitis and outcomes of surgery. The benefits of early surgery have to be weighed against probability of negative appendectomy and associated complications. Also, the role of non-operative management as treatment of acute appendicitis is being investigated. Various articles have been published which compare delay in treatment to complications associated with the delay. Fahim et al³. & Eldar et al⁴ concluded that delay in patient presentation adversely affects the stage of disease in acute appendicitis and leads to increased incidence of infectious complications and to prolonged hospital stay.

However, the possibility of failure of treatment, recurrence and missed differential diagnosis is to be compared with the advantages of nil negative appendectomy rate & early recovery. It has been a matter of debate whether the delay in treatment of patients affects the incidence of complicated appendicitis or the patients can be observed in hospital without increasing the perforation rate. This study was devised to assess the delay in surgical treatment of acute appendicitis and it's relation to complicated appendicitis.

AIMS AND OBJECTIVES

To assess the time gap between onset of symptoms and surgery in cases of acute appendicitis in a teaching hospital.

MATERIALS AND METHODS

Study population

This prospective observational study was performed at Tertiary level hospital with total 153 patients and 2 years durations. Data analysis was done using statistical software SPSS Version 23.0. The nature of the data was studied using frequency tables for categorical variables and mean, standard deviation and range were found out for data on numerical scale. The p-value less than 0.05 was considered significant.

Inclusion group

All patients who presented as acute appendicitis in this hospital.

Exclusion criteria

1. Patients unwilling/unfit for surgery
2. Patients who were proven not to have acute appendicitis on table.

RESULTS AND DISCUSSION

Demographic data

A total of 153 patients were included in the study including 116 males and 37 females with a male to female ratio of 3.13. In the present study, the mean age of presentation was 26.04 years with the mean age of males and females being 26.16 years and 25.64 years respectively. These findings were similar to the findings in the study by Maraju et al. of 114 patients with the mean age of 28.3 years⁵. Majority of the patients (72.3%) of acute appendicitis in our study belonged to age group of 10-30 years.

Presenting complaints

Pain was found to be the most common complaint by the patients in our study. It was the chief complaint in 92.1% of the patients. These findings are in accordance with study published by Prystowsky et al. However, the incidence of fever (29.4%) and rebound tenderness (76.5%) was lower in our study as compared to findings mentioned in the study by Prystowsky et al⁶.

Delay in treatment

Pre-hospital delay

In our study, 117 (76.48%) patients presented within 24 hours while 36 (23.53%) patients reported later than 24 hr. The mean pre-hospital delay was 21.73 hours and the delay ranged from 6-72 hours. The mean pre-hospital delay was lesser in our study as compared to studies conducted by Sadot et al⁷. with a mean delay of 31 hr and Maroju et al⁵. with a mean delay of 24 hr in simple and 63 hr in advanced appendicitis. Most of the elderly patients (67%) reported with a delay of more than 24 hr. Use of self medication and treatment from local practitioner were the most common causes (38.56%) for delay greater than 12 hours. About 19 % patients did not report early because of mild symptoms. The incidence of various factors affecting pre-hospital delay has not been reported in published data.

Hospital delay

In the present study, the mean hospital delay was 5.76 hours. Hospital delay included a delay period from presentation to decision making with a mean of 1.80hr and a delay period from decision of surgery to patient arriving at OT with a mean of 3.95 hr. The hospital delay was lesser as compared to the mean hospital interval of 11.9 hr reported by Sadot et al. . Majority of the patients (83%) patients had a hospital delay between 4 to 8 hr. The delay in decision making was influenced by time taken for imaging and lab investigations. 2 patients underwent CT scan for diagnoses which contributed to a delay of more than 8 hr. The decision of surgery was taken in 3 hr or less in most of the patients.

The delay in taking the patient to OT was influenced primarily by the availability of anesthesiologist and OT (82). A small number of patients were delayed because they did not consent for surgery initially (4.57%) or were advised to be kept nil orally for a few hours before taking up for surgery (3.27%). The hospital factors causing delay in surgery have not been studied in much detail in previous studies.

Total delay

The average total delay in our study was 27.49 hours. 74 (48.3%) patients were operated within 24 hours of onset of symptoms while 60 (39.2%) patients had a delay of 24-48 hours and 19 (12.41%) patients underwent surgery more than 48 hours after the onset of symptoms. 75% of children less than 10 yr were operated within 24 hr. The mean total delay in our study was lesser than the delay of 42.9 hours as reported by Sadot et al⁷.

Study	Prospective/retrospective	Total delay	Pre-hospital	In-hospital
Beecher et al ⁹ . 2015	Retrospective	Not available	Not available	12 hr 27 min (Mean)
Byeong Geon Jeon et al ¹⁰ . 2016	retrospective	Not available	19.9 hr (median)	5.1 hr (median)
V Y Kong et al ¹¹ . 2014	Prospective	6.4 days (Mean)	2.7days-simple 4.4days - advanced	Not available
Maroju et al ⁵ . 2004	Prospective	Not available	24 hr-simple 63 hr-advanced	Not available
Fahim et al ³ . 2005	Prospective	Not available	1.59days-simple 2.43days-advanced	9.24 hr-simple 7.3hr-advanced
Saar et al ¹² . 2016	Prospective	Not available	27.1 hr	6.3 hr
Sadot et al ⁷ . 2013	Retrospective	42.9 hr (mean)	31 hr (mean)	11.9hr (mean)
This study	Prospective	27.49 hr (mean)	21.73 hr	5.76 hr

A comparison of the delay in treatment mentioned in few studies is

enumerated in table

Post-op stay

The mean post-op stay was found to be 3.6 + 0.82 days. The mean length of hospital stay was 3.4 days in the study by Sadot et al⁷. which was similar to the findings in our study.

Complicated appendicitis

Name of study	No of patients	Complicated appendicitis
Bickell et al ¹³ .2006	219	16%
Musunuru et al ¹⁴ .2007	411	13%
Sadot et al ⁷ .2013	1604	9.9%
Eldar et al ¹⁵ .1997	486	32%
Bhangu et al ¹⁶ .2014	2510	32.4%
Present study	153	11.11%

In the present study, it was observed that the presence of fever was significantly associated with complicated appendicitis with a p-value of 0.024 using Pearson's Chisquare test which was similar to findings in study by Sadot et al. (81). The post-op stay and duration of surgery were also found to be associated with complicated appendicitis with p-values of <0.05. Maroju et al. also reported a significantly longer hospital stay in cases of complicated appendicitis (8.9 days) as compared to early appendicitis group⁵ (5.3 days). Menes and Bickell also observed that complicated appendicitis patients had significantly longer post-op stay⁸.

Complicated appendicitis was associated longer post-op stay with statistically significant p-values.

This study has few limitations. It was conducted at a single centre. All those patients who were managed non-operatively have not been included. A study with higher number of patients is recommended to find out the influence of delay on the incidence of complicated appendicitis.

CONCLUSION

1. The presentation of acute appendicitis is highly variable, with pain and tenderness being the most consistent clinical features.
2. The pre-hospital delay forms the predominant part of total delay in treatment and surgeons have no control over it. The most common causes of prehospital delay are over the counter medications and treatment from local practitioners.
3. Delay caused by the use of imaging in cases of acute appendicitis is not associated with complicated appendicitis.
4. Availability of dedicated OT and anesthesiologist for surgical cases can reduce the hospital delay in majority of cases.
5. The post-op stay are significantly longer in cases of complicated appendicitis.

Recommendation

Since the delay in hospital is not significantly associated with incidence of complicated appendicitis, patients should be worked up adequately preoperatively in order to reduce incidence of negative appendectomy.

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