

Comparison of Conservative versus Surgical Management of Acute Appendicitis in Terms of Hospital Stay

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ABSTRACT

Aim: To compare the hospital stay of patients of appendicitis with conservative or surgical management in context of age and gender.

Study design: Randomize Controlled Trial

Methods: Purposive sampling technique was used. G power calculator was used to compute the total number of participants. Diagnosed appendix patients (n=100) with equal distribution of treatment conservative (n=50) and appendectomy (n=50) with age ranges of 16 years to 45 years (conservative group=31.26±9.13 and appendectomy group=29.32±7.96) were included. Patients with a final diagnosis of appendicitis presenting within 24 hours of onset were included in the study. While appendicular mass, perforated appendix, gangrenous appendix with signs of peritonitis, patients with chronic co-morbid conditions e.g. DM and patients with bleeding disorders, renal insufficiency, and liver problems were excluded from the study. Demographic form and MANTRELS Score (Alvarado, 1986) were used to collect data of Lahore General Hospital, Lahore by considering all the ethical issues. Total duration of this study was six months.

Results: Significant difference ($t = 10.61$; $p < 0.05$) was found in term of hospital stay of patients in conservative group (3.02±0.82 days) and appendectomy group (1.58±0.50 days). Results were also significant on the scores of Alvarado and age.

Conclusion: This study showed significant differences in both groups (appendicitis and conservative) in terms of hospital stay, age and gender.

Keywords: Appendectomy, conservative treatment, hospital stay

INTRODUCTION

In 1731 William Coakesley performed first appendectomy. After Mcburney, appendectomy was considered as the treatment for appendicitis. It is known since 19th century that disease progresses to perforated appendix in the absence of appendectomy^{1,2,3}

Acute appendicitis is considered one of the commonest intra-abdominal infections seen in general surgical departments, which can be treated easily if accurate diagnosis is made in time³.

The commonest emergency surgical procedure is appendectomy with a lifetime risk of about 6%³. Still 15-30% normal appendices are removed^{4,5}. Antibiotics are routinely used in appendicitis particularly where early catarrhal disease is suspected. But this practice was not supported as mentioned in different studies⁴. Appendicitis with diagnostic and treatment delay is associated with increased morbidity and mortality. So surgeons traditionally advise such patients early surgery to avoid it⁴.

Often patients with acute appendicitis have characteristic symptoms and physical findings, atypical presentations are common. Accurate identification and segregation of patients who need immediate surgery as compared to those who will benefit from conservative treatment is not straightforward. In other studies diagnostic accuracy of Alvarado score has been found to be 85.71%, while the accuracy of clinical diagnosis was 93.01%,

specificity was 87.5% and sensitivity was 98%^{1,5}. C-reactive protein monitoring in-ceases the diagnostic accuracy of acute appendicitis⁶. So in this scenario, some clinicians can keep a patient under observation to avoid surgery. But it can increase hospital stay if surgery is decided later on.

The objective of this study was to compare the hospital stay of patients of appendicitis with conservative or surgical management.

MATERIAL AND METHODS

It was a randomized control trial of six months. This study was carried out at Lahore general Hospital, Lahore, Pakistan after getting permission from Hospital Ethical Committee. 100 patients with diagnosis of acute appendicitis were included in the study according to calculated sample size, through non-probability purposive sampling. All the data was collected on a pre-designed proforma. Study variables like age, sex, Alvarado score (Table-1) and hospital stay were analyzed by simple descriptive statistics. p value <0.05 was considered significant.

Inclusion criteria:

- Patients 15 to 45 years of age with a final diagnosis of appendicitis presenting within 24 hours of onset were included in study. Patient with Alvarado score > 3 and < 7.
- Informed consent was taken from all patients.

Exclusion criteria

- Appendicular mass, perforated appendix, gangrenous appendix with signs of peritonitis.
- Patients with chronic co-morbid conditions e.g. DM, (BSR>180mg/dl), history of immune suppressed, CLD

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(medical record), hypertensive patients (BP> 140/90mmof Hg).

- Patients with bleeding disorders (INR>2), renal insufficiency (serum creatinine > 1.2mg/dl), liver problems (ALT > 40IU, AST>40IU).

In group A 50 patients were managed with antibiotics i.e. Intravenous fluids and antibiotherapies with ampicillin 1gm 4hrly+gentamicin 160mg/day+metronidazole 500mg 8hrly and analgesia with diclofenac sodium 75mg 8hrly IM/day after cessation of oral feeding. In group B, 50 patients were managed with surgical procedure i.e. appendectomy. All surgeries were done by single surgical team. Patients were followed up in ward till discharge and total hospital stay was noted and the proformas were filled accordingly.

Data Analysis: Using SPSS version 20, Mean±SD and median with inter-quartile range was given for quantitative variables i.e., age, hospital stay and Alvarado score. Frequency and percentage was given for gender. Shapiro Wilk test was used to check the normality of data. Data was not normally distributed so non parametric Mann Whitney U test was used to observe mean difference in hospital stay and Alvarado score between groups. A p-value of ≤ 0.05 was considered statistically significant.

Table I: Mantrel's score (Alvarado, 1986)

Characteristic	Score
M = Migration of pain to the RIF	1
A = Anorexia	1
N = Nausea and vomiting	1
T = Tenderness	2
R = Rebound tenderness	1
E = Elevated temperature	1
L = Leukocytosis	2
S = Shift of WBCs to the left	1
Total Significant score =7	10

RESULTS

The age ranges of participants were varied from 16 years to 45 years (conservative group=31.26±9.13 and appendectomy group =29.32±7.96). There were 52 (52%) patients of age 16-30years while 48 (48%) had age range 31-45years. There were 21 males and 29 females in conservative group and 23 males and 27 females in appendectomy group. Minimum Alvarado score in both groups are 4 and maximum is 6 (Conservative group=4.82±0.83 and Appendectomy 4.88±0.85). Hospital stay of patients in conservative group was 3.02±0.82 days while appendectomy group was 1.58±0.50 days. Furthermore, significant difference was found in both groups in context of hospital stay (p< 0.05) (see Table 2 for details).

Data was stratified for age of patients. In patients 16-30 years of age, the mean hospital stay of patients in conservative group was 3.00±0.72 days while in appendectomy group was 1.68±0.48 days. Significant difference was in both groups (p<0.05). In patients aged 31-45 years, the mean hospital stay of patients in conservative group was 3.04±0.92 days while in appendectomy group was 1.45±0.51 days. Difference was significant in both groups (p<0.05) (see Table 3 for detail).

There were 44 (44%) males while 56 (56%) females. Data was stratified for gender of patients. In males, the mean stay in conservative group was 3.10±0.83 days while in appendectomy group was 1.65±0.49 days. There was significant difference in both groups (p<0.05). In females, the mean stay, in conservative group was 2.97±0.82 days while in appendectomy group was 1.52±0.51 days. The difference was significant in both groups (p<0.05) (Table 3).

In this study, 43 patients had Alvarado score 4, 29 had score 5 and 28 had score 6 (Table 3). Data was stratified for Alvarado score of patients. In patients with score 4, the mean stay in conservative group was 3.14±0.89days while in appendectomy group was 1.71±0.46days. In patients with score 5, the mean stay of patients in conservative group was 2.93±0.80days while in appendectomy group was 1.50±0.52days. In patients with score 6, the mean stay in conservative group was 2.92±0.76days while in appendectomy group was 1.47±0.52days. Again the difference was significant. (p<0.05) (see Table 3 for details)

Table 2 showed the significant differences in both groups (Conservative and Appendectomy) (t = 10.61: p < 0.05).

Table 2: Comparison of hospital stay in groups of conservative and appendectomy (n=100)

Groups	Mean	Standard Deviation	t	p-value
Conservative	3.02	0.82	10.61	0.000
Appendectomy	1.58	0.50		

Table 3: Comparison of Gender, Alvarado Scores, Age and hospital stay in Conservative and Appendectomy (N = 50 each group)

Gender	Hospital stay	Group		P value
		Conservative	Appendectomy	
Male	N	21	23	0.00
	Mean	3.10	1.65	
	SD	0.83	0.49	
Female	N	29	27	0.00
	Mean	2.97	1.52	
	SD	0.82	0.51	
Alvarado Score				
4	N	22	21	0.00
	Mean	3.14	1.71	
	SD	0.89	0.46	
5	N	15	14	0.00
	Mean	2.93	1.50	
	SD	0.80	0.52	
6	N	13	15	0.00
	Mean	2.92	1.47	
	SD	0.76	0.52	
Age				
16-30	N	24	28	0.00
	Mean	3.00	1.68	
	SD	0.72	0.48	
31-45	N	26	22	
	Mean	3.04	1.45	
	SD	0.92	0.51	

DISCUSSION

The commonest surgical abdominal emergency is appendicitis^{7,8,9}. Classically acute appendicitis can be diagnosed with a history of abdominal pain, nausea, pain migration to the right iliac fossa, tenderness and increased total leukocyte count and shift to the left. Accurate

diagnosis based on symptoms ranges from 70% to 80%^{10,11}. However, atypical presentations pose diagnostic errors. The diagnostic difficulties may lead to unnecessary laparotomies whereas misdiagnosis can be a cause of perforation and abscess formation^{12,13}. Perforation of an inflamed appendix occurs in 15-25% of patients treated surgically, with the highest rates encountered in children and elderly patients^{12,14}.

Laboratory tests performed easily, often help clinicians in decision making about patients with suspected acute appendicitis. Among these tests, C-reactive protein (CRP) concentration is the most widely used acute phase protein and is considered to be a good predictor of acute appendicitis^{15,16,17}.

One study conducted by Simillis C et al in 2010 reported that the conservative management of acute appendicitis is associated with comparable results regarding hospital stay with appendectomy¹⁸.

Only Hansson et al¹⁹ reported a reduced stay in the antibiotic treated group, and no significant differences were noted in the other studies despite a reduced trend being seen in the antibiotic group.

Chang SS et al in 2014 reported no statistical difference between the conservative and surgical management for acute appendicitis regarding hospital stay regarding the early and delayed appendectomy²⁰.

In our study, the mean age of patients in conservative group was 31.26±9.13years while in appendectomy group was 29.32±7.96years. There were 21 males and 29 females in conservative group. In our study, the mean hospital stay of patients in conservative group was 3.02±0.82days. The mean hospital stay of patients in appendectomy group was 1.58±0.50days. There was significant difference in both groups and appendectomy group showed less hospital stay (p<0.05).

According to our study, we calculated the mean age of these patients as 27.09±11.93 years. In our study, we observed more male patients (55.65%) as compared to female patients (44.35%) presented with symptoms of acute appendicitis. In another study, almost the same results were observed like there were more male patient as compared to female patients (males:61% and females:39% with a mean age of 22.3 ± 19.4 years²¹).

We reviewed the sign and symptoms of patients presenting with suspicion of appendicitis and observed that iliac fossa pain was very much common among all the patients. Anorexia, nausea, vomiting and pyrexia were also very common symptoms. Abdominal tenderness and Rebound tenderness was observed in almost in all cases, Psoas sign was observed in less patients and obturator sign was observed only in few cases.

In one study, the signs and symptoms of acute appendicitis were reviewed. Pain migration to the right iliac fossa and guarding support the diagnosis of appendicitis. The diagnosis of appendicitis should be doubted when anorexia, nausea and vomiting or right iliac fossa tenderness is absent. Patient presenting near menstruation, cervical tenderness and bilateral adnexal tenderness indicates PID. With a sound knowledge of signs and symptoms of acute appendicitis and a constant awareness of its prevalence, the diagnostic accuracy can be increased²².

CONCLUSION

Through this study, it is concluded that age and gender distribution of appendicitis is almost the same. But there is significant difference regarding the hospital stay with more in conservative treatment than surgery i.e. appendectomy. So uncomplicated appendicitis merits consideration for use of antibiotics as initial management option.

Implications: Non complicated appendicitis can be treated with antibiotics in early phase and it decreases load of admission and surgery on hospitals. This study with randomized controlled trial showed that we can use antibiotics safely as primary treatment in patients having acute uncomplicated appendicitis. This way, the risks of general anesthesia and surgery are reduced.

Conflict of interest: Nil

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