Antibiotic Therapy Versus Appendectomy for Uncomplicated Acute Appendicitis

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ABSTRACT

Objective — *To compare the antibiotic therapy with conventional appendectomy for treatment of uncomplicated acute appendicitis in terms of duration of pain and hospital stay.*

Study design — *Comparative study.*

Place & Duration of study — *Surgical Unit III, Department of Surgery, PIMS Islamabad, From July 2016 to June 2017.*

Methodology — *Patients of both genders aged =13 years with uncomplicated acute appendicitis were allocated into two treatment groups. Patients in Group-A were managed conservatively on antibiotics while those in Group-B underwent appendectomy. Outcome variables noted were mean number of days patient experienced pain and mean duration of hospital stay. Patients were followed up to six months for any complications. Informed consent was obtained.*

Results — *A total of 112 patients of both genders were enrolled. The mean age of the patients was 27.09±13.54 year. There were 64 (57.14%) male and 48 (42.85%) female patients with male to female ratio of 1.3:1. The mean duration of pain in group A was 3.70±1.67 days while in group B 3.52±1.68 days (p=0.592). Similarly, the mean duration of hospital stay was 3.22±1.59 days in antibiotic group and 3.02±1.52 days in appendectomy group (p=0.521). Fifteen (27.2%) patients of antibiotic group underwent appendectomy within six month of follow up.*

Conclusion — *Majority of patients with antibiotic treatment for uncomplicated acute appendicitis did not require appendectomy during the six months follow up period.*

Key words — *Acute Appendicitis, Appendectomy, Antibiotics.*

INTRODUCTION:

Acute appendicitis is the most common cause of an acute abdomen in young adults and hence one of the commonest conditions presenting in emergency. Although appendectomy is considered as the standard treatment of acute appendicitis, the use of antibiotic therapy as the main treatment for uncomplicated acute appendicitis has recently increased.[1,2] There is growing evidence supporting the use of antibiotics rather than surgery to treat patients with uncomplicated acute appendicitis.[2] This treatment is explored as an alternative option since other intra-abdominal infections such as enterocolitis, diverticulitis and salpingitis are treated conservatively with medications.[3] In 1930 Bailey et al described the conservative management of appendicitis, including rest and fasting followed by delayed elective appendectomy.[4] Coldrey reported antibiotic therapy in patients with acute appendicitis in 1956. Mortality was low (0.2%) and only 14.4% patients suffered recurrent appendicitis.[5] In a randomized clinical trial in 1995, Eriksson S reported no difference in efficacy

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Later antibiotic first strategy is experimented in Europe with supportive evidence through meta-analysis and reviews.[7-9]

Conservative therapy with antibiotics appeared safe in the last 10 years and can be an effective alternative first-line treatment for acute appendicitis, although the long-term risk of recurrence or other complications are unknown.[10] The use of antibiotic therapy in treating uncomplicated acute appendicitis is, however, still controversial. This study was designed to evaluate the use of antibiotics in the treatment of uncomplicated acute appendicitis in adult patients. The study aimed to equate antibiotic therapy and appendectomy in patients with uncomplicated acute appendicitis in terms of duration of pain and hospital stay in both the groups.

METHODOLOGY:

A prospective comparative study was conducted at Surgical Unit III, Department of General Surgery, PIMS Islamabad, from July 2016 to June 2017, after taking ethical approval from institutional ethical committee. Sample size of 117 patients was calculated using WHO sample size calculator taking level of significance =5%, Power of test =80% and population standard deviation as 5. Non-probability, consecutive sampling technique was used for patient selection.

All adult patients above 13 years of age with uncomplicated acute appendicitis based upon clinical examination (fever, localized tenderness) and ultrasound (presence of echogenic tubular structure) were included in the study. Patients with co morbid like diabetes mellitus, tuberculosis, asthma, hypertension, previous abdominal surgery, pregnant females and patients with deranged coagulation profile, were excluded. Patients in whom appendicular lump was present on clinical examination and demonstration of same of ultrasound with fluid, were also excluded.

After obtaining informed consent patients were enrolled and divided into antibiotic therapy and appendectomy groups using lottery method. Patients in antibiotic group received Inj. ceftriaxone 1gram twice a day and Inj. metronidazole 500mg three times a day. Inj paracetamol 1gram was given three times a day for pain management.

Demographic and medical data were collected. Variables noted included age, sex, investigations, co-morbid conditions, length of hospital stay and the number of days the patient experienced pain. Pain scores were obtained using visual analogue scale (VAS) from 0 no pain to 10 worst possible pain. Duration of pain was measured in days from the day of presentation till the patient had VAS score of =2. Patients were followed up on a regular basis for six months for possible complications, recurrence of appendicitis after conservative treatment, pain scores and use of pain medication. Treatment effectiveness in the antibiotic treatment arm was considered when patient was discharged from hospital without surgical intervention and without recurrent appendicitis during a minimum six-month follow-up. Patient in appendectomy group underwent removal of appendix through open approach.

All the data collected were entered and analyzed through version SPSS 21. Numerical variables like age, number of days the patient experienced pain and duration of hospital stay presented as mean ±SD. The categorical variables like gender and the appendectomy conversion were reported in frequency and percentage. The success rate for surgery was presumed to be 99% for statistical purposes. Previous related research found success rates of approximately 70% to 80% for antibiotic treatment.[11] We anticipated a success rate of 75% in the antibiotic therapy group. Independent sample t test was used to compare the mean number of days the patient experienced pain and duration of hospital stay between the groups taking p =0.05 as statistically significant.

RESULTS:

A total of 117 patients were enrolled however five were lost to the follow up, so finally 112 patients were available of analysis. There were 64 male (57.14%) and 48 (42.85%) female patients with a ratio of 1.3:1. Age of patients was from 13 year to 65 years (mean 27.09±13.54 year). Both the study groups were comparable in terms of mean age, hemoglobin, TLC, age and gender (table I). Fifteen (27.2%) patients in the antibiotic group ultimately underwent appendectomy; five during the initial hospitalization when they did not settle and required appendectomy after a mean duration of 2.54±0.52 days (from 2-3 days) and ten within the six months of follow up who presented with recurrent appendicitis.

The mean period of pain in both the study groups was not significantly different (antibiotics vs. appendectomy groups - 3.70±1.67 days vs. 3.52±1.68 days; p=0.592); but pain score was significantly less in antibiotic group at discharge and at one week (2.0 & 1.0) as compared to appendectomy group (3.0 & 2.0) respectively. However there was no significant difference of pain

Table I: Baseline Characteristics of Study Groups			
Characteristics	**Antibiotic Group (n=55)**	**Appendectomy Group (n=57)**	**P value**
Age (years)	27.40±13.81	26.78±13.41	0.820
13-25 years	40 (72.7%)	39 (68.4%)	0.908
26-45 years	6 (10.9%)	8 (14.0%)	
46-65 years	9 (16.4%)	10 (17.5%)	
Gender			
Male	33 (60.0%)	31 (54.4%)	0.840
Female	22 (41.8%)	26 (43.8%)	
Hemoglobin (g/dl)	12.80±2.27	12.82±2.03	0.970
TLC (/mm^3)	11108±3430.70	11126±3353.99	0.979

Chi-square test and Independent sample t-test, observed difference was statistically insignificant

Table II: Comparison of Outcomes Among Groups			
	Antibiotic Group (n=55)	**Appendectomy Group (n=57)**	**P value**
Pain experienced (days)	3.70±1.67	3.52±1.68	0.592
Length of primary Hospital Stay (days)	3.22±1.59	3.02±1.52	0.521
Pain (VAS) score			
At discharge	2.0	3.0	<.001
At one week	1.0	2.0	<.001
At two months	1.0	1.0	.40

Independent sample t-test

scores at two months in both groups (p=0.40). Similarly, the mean duration of hospital stay was not significant in the antibiotic vs appendectomy groups (3.22±1.59 vs. 3.02±1.52 days; p=0.521). Comparison of outcomes is given in table II.

DISCUSSION:

Appendectomy has been considered as the standard treatment for acute appendicitis until now.[2] Many authors have recently proposed that acute appendicitis could be treated with antibiotics only.[12] Some researchers support interval appendectomy due to the risk of recurrent episodes of acute appendicitis and the likelihood of a missed neoplasm; nevertheless, there seems to be a increasing tendency toward the only use of antibiotics to avoid surgery.[13] This is based upon the notion that many inflammatory conditions of the abdomen can be treated without surgical intervention and that the present surgical management of acute appendicitis is established mainly as convention rather than evidence.[14] However, using antibiotics in treating appendicitis is in fact not only complex rather dependent upon many factors like uncomplicated vs. complicated, adults vs. children, definitive treatment vs. interval to appendectomy and other treatment options. The resultant selection bias may produce variable outcome that is reported in many studies.[8]

The mean age of the patients in the present study was 27.09±13.54 year, that is in consistent with other studies.[15-17] Appendicitis is more common in younger age group (13-25 years). There was a male predominance among acute appendicitis patients with a male to female ratio of 1.3:1 in this study. Yilma et al also found a similar male predominance.[18]

Fifteen (27.2%) patients in the antibiotic group ultimately underwent appendectomy; five during the initial hospitalization and ten within the six months of follow up who presented with recurrent appendicitis. Our observation follows that of Salminen et al, who also recorded similar frequencies of 29.6% for appendectomy in patients initially managed on antibiotics.[19] Vons et al and Hansson et al however reported a much higher frequency of 37% and 48% for conversion to appendectomy in antibiotic-first regimen.[20,11] Contrary to this, Talan et al reported a quite lower frequency of 6.25%.[21]

Although the non-inferiority of antibiotic treatment with appendectomy for uncomplicated acute appendicitis has not been identified in this study, 40 out of 55 (72.8%) patients were successfully treated with antibiotic therapy alone.

The mean period of pain in both the study groups was not significantly different which is similar to other studies.[19,22] Selection of antibiotics was a limitation for treating appendicitis. A broad spectrum antibiotic must be used to cover all pathogens that might cause appendicitis. Similarly, we observed that the mean length of hospital stay was only minimally longer in the antibiotic group (3.22±1.59 vs. 3.02±1.52 days; p=0.521); however it was predefined to ensure the patient safety. Similar results were reported by others.[7,19]

This study found insignificant differences in the mean duration of pain and hospital stay with conservative versus operative treatment of acute appendicitis. Consequently, in the light of the findings of this study, it can be recommended that in future practices patients with uncomplicated appendicitis may be given a trial of conservative treatment with antibiotics avoiding surgery with its related complications. However, close monitoring and immediate intervention is needed, if conservative management fails.

CONCLUSIONS:

Most of the patients in antibiotic treatment group did not require appendectomy during the six months follow-up period. A trial of antibiotics treatment in uncomplicated acute appendicitis is still an option which is worth trying.

DISCLOSURE:

This article is based on the thesis for MS General Surgery by Dr Adeel ur Rehman Kandaan to SZABMU, Islamabad and is approved.

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Received for publication: 25-03-2020

Accepted after revision: 30-05-2020

Author's Contributions:
Adeel ur Rehman Kandaan: Conception, design of work, drafting and accountable for all aspects.
S. H. Waqar: Conception, design of work, drafting, accountable for all aspects and final approval.

Conflict of Interest:
The authors declare that they have no conflict of interest.

Source of Funding: None

How to cite this article:
Kandaan AR, Waqar SH. Antibiotic therapy versus appendectomy for uncomplicated acute appendicitis. J Surg Pakistan. 2020;25 (1):3-7. Doi:10.21699/jsp.25.1.2.