

## A Study of Acute Appendicitis and Its Surgical Management in a Tertiary Care Hospital

Dr. Srinivas Bheemanadam\*

Assistant Professor, Department of General Surgery, Pratima Institute of Medical Sciences, Nagunoor, Karimnagar Telangana, India

### Original Research Article

\*Corresponding author

Dr. Srinivas Bheemanadam

#### Article History

Received: 03.10.2018

Accepted: 17.10.2018

Published: 30.10.2018

#### DOI:

10.36347/sjams.2018.v06i10.052



**Abstract:** Acute appendicitis is a common surgical emergency faced by the General Surgeons during their practice. It has a tendency to occur in children and in young adults. The aim of the present study was to investigate the number of cases, clinical presentation, management and complications of appendicitis in patients of acute appendicitis reporting to our tertiary care hospital. Methods: This cross-sectional prospective study was done in the Department of General Surgery, Prathima Institute of Medical Sciences, Naganoor, Karimnagar. A total of 52 patients were included in the study out of which male (n=34) and female (n=18). Alvarado scoring was used to group the patients into three groups, Group I those with Alvarado Scores > 7 group II those with scores range of 5 - 6 and those with scores of < 4 were included in the group III. Those in group I and group II underwent the surgical operation of Appendectomy and those in the group III were treated conservatively with antibiotics and discharged. The patients who underwent surgery were kept in observation for 7 days and then discharged. They were followed every month for 6 months for development of any complications. Results: The majority of patients belonged to the age group of 10 – 20 years having (n=29) (55.77%). The predominant symptom seen in these patients was the presence of abdominal pain in both male 34 (100%) and female 18 (100%) of patients. The patients were grouped into three groups based on Alvarado scores, those with Alvarado scores of > 7 were included in Group I and patients with Alvarado scores ranges of 5-6 were included in Group II and patients with Alvarado Scores of < 4 were included in the Group III. The most common complication reported by 2 male and 1 female patient was wound infection which was treated by debridement and antibiotic administration and the post-surgical abscess was reported in 1 male patient. Conclusion: Acute appendicitis was more common in the younger population and there is an overall predominance of the male for acute appendicitis. Alvarado score is a very useful tool in the selection of the patients for surgeries and strict adherence to protocol and proper post-operative care can reduce the numbers of complications of surgery.

**Keywords:** Acute Appendicitis, Surgical Management, Tertiary Care Hospital.

### INTRODUCTION

Appendicitis is inflammation of vermiform appendix it is the commonest cause of surgical intervention. The term acute appendicitis was first introduced by Ringald H Fitz in 1886, which attributed the disease called typhlitis to the acute inflammation of the vermiform appendix [1]. Appendectomy is a classic surgical procedure of removal of the appendix. The probability of appendicitis is approximately 6% in general population and its incidence is 86 per lakh population per year [2]. The frequency of development is greater in male as compared to the female by a ratio of 1.4:1 [3]. The peak incidence is seen in 10 -30 years of ages [4]. The etiology of appendicitis includes fecoliths, lymphoid hyperplasia, caecal carcinoma which causes intra luminal obstruction that gives rise to

increased intra-luminal pressure which results in ineffective lymphatic and venous drainage allowing bacterial growth and inflammation in advanced cases perforation and spillage of pus in the peritoneal cavity [5]. Diet and hereditary background are also considered important factors [6, 7]. The clinical presentation of acute appendicitis is periumbilical or epigastric pain and shifting of pain after 4-6 hours to right iliac fossa accompanying nausea vomiting. The diagnosis of acute appendicitis can be established clinically by the presence of periumbilical shifting pain and tenderness No single sign or symptom can rule out acute appendicitis [1, 7]. The diagnosis of appendicitis is made mainly by history and physical examination including laboratory investigations and radiologic findings. There may be unusual clinical presentations

due to variations in the position of appendix [8]. The common laboratory features suggestive of appendicitis are included in white blood count, increased in PMN's increased CRP levels are associated with the risk and severity of complications in appendicitis [9]. Left untreated acute appendicitis may lead to complications leading to appendix abscess or rupture with generalized peritonitis. Delay in seeking medical help and delay on part of the surgeon is responsible for the combined delay in diagnosis and definitive management. Surgical treatment of acute appendicitis is a highly successful intervention. Risks of surgical complications do exist including the cost of surgery. Hence surgeon has to balance the morbidity and mortality related to miss the diagnosis and exposing the patients to unnecessary surgeries due to incorrect diagnosis [10]. With this background we in the present study tried to evaluate the number of cases, clinical presentation, management and complications of appendicitis in patients of acute appendicitis reporting to our tertiary care hospital.

**MATERIALS AND METHODS**

This cross-sectional prospective study was done in the Department of General Surgery, Prathima Institute of Medical Sciences, Naganoor, Karimnagar. It is a Teaching and tertiary care hospital in Karimnagar. Institutional Ethical committee permission was obtained for the study. Informed consent was obtained from all the patients included in the study after explaining the purpose of the study and the expected results in their local language. The inclusion criteria were patients who had been diagnosed with acute appendicitis, those with suspected appendicitis and admitted to Inpatient of General Surgery of PIMS, Karimnagar. No other medical co-morbidities existing with the patients. Exclusion criteria were those who were not diagnosed with appendicitis, those not willing to participate in the study. Those with significant medical co-morbid

conditions like Diabetes Mellitus and hypertension. A detailed history and clinical examination were done for all patients with regarding symptoms of pain, its duration, onset, character, migration, radiation, aggravating factors, and relieving factors, symptoms of nausea, vomiting, constipation diarrhea, and fever were noted. Laboratory investigations were done with regard to TLC, DC, Urine examination, Fasting Blood sugar levels, and abdominal Ultrasonography were performed in patients. Based on the above criteria a total of (n=52) patients were included in the study out of which male (n=34) and female (n=18). Alvarado scoring [11] was used to group the patients into three groups, Group I those with Alvarado Scores > 7 group II those with scores range of 5-6 and those with scores of < 4 were included in the group III. Those in group I and group II underwent surgical operation of Appendectomy and those in the group III were treated conservatively with antibiotics IV cefotaxime 1g twice and metronidazole 1.5 g once was given with IV fluids those who had improved were discharged with oral antibiotics ciprofloxacin 500 mg twice a day and metronidazole 400 mg three times a day for a total of 10 days and discharged. The patients who underwent surgery were kept in observation for 7 days and then discharged. They were followed every month for 6 months for development of any complications.

**RESULTS**

A total of 52 patients with established diagnosis were included in the study. The majority of patients belonged to the age group of 10 – 20 years having n=29 (55.77%). The 21 – 30 years had 10 cases 19.23% and 31 – 40 years having 6 and 11.54% of the patients and 41 – 50 years having 7.7% of patients and 51 – 60 years having 2 (3.84%) of patients and > 60 years only 1 patient shown in table 1.

**Table-1: Showing the age and sex wise distribution of the cases**

Age Group	Male	Female	Total	Percentage
10 – 20	17	12	29	55.77
21 – 30	7	3	10	19.23
31 – 40	4	2	6	11.54
41 – 50	3	1	4	7.7
51 – 60	2	0	2	3.84
> 60	1	0	1	1.92
Total	34	18	52	100

The predominant symptom seen in these patients was the presence of abdominal pain in both male 34 (100%) and female 18(100%) of patients. The presence of fever was complained by 22 (64.07%) male patients and 15 (83.33%) of female patients. Vomiting was seen in 10 (29.41%) male and 11 (61.11%) female patients, constipation was seen in 3 (8.82%) of male and 2 (11.11%) of female patients Diarrhoea was complained by 12 (35.29%) male and 6 (33.33%) of female patients shown in table 2.

The patients were examined clinically and presence of abdominal tenderness was in 34 male and 18 female patients 100% of the total of 52 patients. Similarly, rebound tenderness was seen in 14 (26.92%) of patients. Pyrexia was shown in 12 male and 7 female patients totaling 19 (36.54%) guarding was seen in 16 (30.77%) of patients Pointing sign was seen in 21 (40.38%) of patients given in table 3.

**Table-2: Clinical symptoms of the patients involved in the study**

Symptoms	Male (n=34) %	Female (n=18) %
Duration of illness	2.5 ± 1.5 days	2.0 ± 1.0 days
Abdominal Pain	34 (100%)	18 (100%)
Fever	22 (64.07%)	15 (83.33%)
Vomiting	10 (29.41%)	11 (61.11%)
Constipation	3 (8.82%)	2 (11.11%)
Diarrhea	12 (35.29%)	6 (33.33%)

**Table-3: Showing the positive findings recorded in the patients**

Positive signs	Male	Female	Total	Percentage
Abdominal Tenderness	34	18	52	100
Rebound Tenderness	9	5	14	26.92
Pyrexia	12	7	19	36.54
Guarding	10	6	16	30.77
Pointing Sign	12	9	21	40.38

The patients were grouped into three groups based on Alvarado scores, those with Alvarado scores of > 7 were included in Group I and patients with Alvarado scores ranges of 5-6 were included in Group II and patients with Alvarado Scores of < 4 were

included in the group III. The group I and group II patients underwent surgery and group III patients were put on antibiotics and managed conservatively and discharged table 4.

**Table-4: Group wise distribution of the patients based on Alvarado Scores [11]**

	Alvarado Scores	Male (n=34) %	Female (n=18) %
Group I	> 7	21 (61.74 %)	10 (55.56%)
Group II	5 – 6	6 (17.64 %)	3 (16.67%)
Group III	< 4	7 (20.59 %)	5 (27.78%)

The most common complication reported by 2 male and 1 female patient was wound infection which was treated by debridement and antibiotic

administration and the post-surgical abscess was reported in 1 male patient and no cases of ileus were found in our study given in table 5.

**Table-5: Postoperative complications in patients**

Complication	Male (n=27)	Female (n=13)	Total n=40 (%)
Wound infection	2	1	3 (7.5%)
Post-surgical abscess	1	0	1 (2.5%)
Ileus	0	0	0
Bowel obstruction	0	0	0

**DISCUSSION**

The present was undertaken in a Tertiary care teaching Hospital in Karimnagar, Telangana state. A total of 52 cases of acute appendicitis were detected and treated during the study period. There were n=34 male patients and n=18 female patients in this study. This shows that there is a preponderance of male over female by 2:1 ratio. Similar findings have been found in a study conducted in Maharashtra by Chaudhari YP *et al.* [12] who found 60% male patients in acute appendicitis and our results are nearly in agreement to S Suresh Babu *et al.* [13] who found 55% of male predominance in cases of acute appendicitis. The most common age group of involvement of acute appendicitis cases was 10 - 20 years group in the present study this is similar to findings of other studies where they have found that the incidences of acute appendicitis are more common in younger age groups [14, 15]. In the present study it was

observed that the presence of colicky abdominal pain was a most common feature of all patients of Acute appendicitis, other signs in decreasing order were Pointing sign 40.38%, Guarding 30.77%, Rebound tenderness 26.92%. Other similar studies have shown that the presence of pain is an important feature of the disease [15, 16]. There were also symptoms of fever and vomiting in considerable numbers of patients. The clinical examination is important for the provisional diagnosis of acute appendicitis. The other tools for confirmation of diagnosis were ultrasound scan. Based on the Alvarado scores we divided the patients into three groups. The group I and group II underwent surgery consequently 40 patients were treated surgically and 12 patients who belonged to group III were treated conservatively using antibiotics. In a prospective study, it was found that use of Alvarado score decrease unusually high positive appendicectomy rates of 44%

to 14% and unnecessary appendectomies carries long-term risks to the patients [12]. A study by H Khan [18] also found Alvarado scores to be very useful in avoiding unnecessary surgeries to the patients of acute appendicitis. A study by J Hansson et al; [authors Hansson *et al.* comparing antibiotics and surgery to treat acute appendicitis found the treatment efficacy 90.8% for antibiotic therapy and 89.2% for surgery. Multicentre randomized trials have recently reported that selected patients of acute appendicitis could be treated successfully with antibiotics and limit the stay duration in hospital [19] and the risk of recurrence must be compared with rates of severe complication after appendectomy [20-22]. The present study found that the rate of complication post-surgery was only 1% and mostly due to wound infections. Our rate of complication is considerably lesser as compared to other similar studies the generally accepted rate of complication after appendectomies range from 4-15%. In the present study probably strict adherence to protocol and proper selection of the patients and good postoperative cares has reduced the incidence of postoperative complications.

#### **CONCLUSION**

Within the limitations of the present study, it can be concluded that acute appendicitis was more common in the younger population and there is an overall predominance of the male for acute appendicitis. Alvarado score is a very useful tool in the selection of the patients for surgeries and strict adherence to protocol and proper post-operative care can reduce the numbers of complications of surgery.

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