

Clinico- Epidemiological Profile of Acute Appendicitis in a Tertiary Care Hospital in North India

Rajesh Kumar¹, Renu Chauhan²

ABSTRACT

Introduction: Acute appendicitis is one of the most common surgical emergencies. Accurate diagnosis of acute appendicitis needs careful history, and physical evaluation, as the diagnosis is primarily clinical.

Material and methods: A cross sectional study was done in 50 patients who underwent emergency appendicectomy for acute appendicitis in a medical college hospital in Shimla. The aim was to study the clinical profile of patients with acute appendicitis and compare it with the existing literature.

Results: Mean age of patients was 26.48 (\pm 12.28) years. Out of 50 patients, 29 (58%) were males and 21 (42%) were females, so male predominance was seen in the present study. Most common complaints were pain in the right iliac fossa (100%), nausea and vomiting (82%), anorexia (80%), and migration of pain (70%). Tenderness in right iliac fossa was present in all patients in our study (100%), while rebound tenderness (70%), guarding (64%), rigidity (6%), Rovsing sign (36%), Psoas sign (46%), Obturator sign (22%), and Dunphy sign (60%), respectively.

Conclusions: Acute appendicitis is more common among males than females, and between 10- 30 yrs of age. The most common presenting features were pain abdomen, anorexia, nausea, and vomiting. The most common signs were tenderness, rebound tenderness and guarding. The rate of accuracy of clinical examination was 86%.

Keywords: Acute, Appendicitis, Clinical Profile, Appendicectomy

INTRODUCTION

Acute appendicitis is the most common cause of emergency abdominal surgery.¹ Approximately 6% of the population suffer from acute appendicitis during their life time.² Overall mortality rate in acute appendicitis ranges from 0.3% in non perforated appendix to 6.5% in cases of perforation.³

The diagnosis of acute appendicitis is established clinically depending on the presenting history and clinical examination. The accuracy of clinical examination has been reported to range from 71% to 97% and varies greatly depending upon the experience of examiner.⁴

Any delay in the diagnosis of acute appendicitis and a consequent delay in appendicectomy can lead to serious outcome like perforation and peritonitis. The negative appendicectomy rate ranges from 15- 35%⁵ and is higher in the young women (upto 45%) because of prevalence of pelvic inflammatory disease (PID) and other common obstetrical and gynaecological disorders.⁶

Improved accuracy is desirable to diagnose appendicitis early and reduce the rate of both perforation and negative

appendicectomy. Hence this study was conducted to study the clinical profile of patients with acute appendicitis presenting to Surgery department of a tertiary care hospital.

MATERIAL AND METHODS

The present study was a cross sectional study conducted in Department of General Surgery, at Indira Gandhi Medical College, Shimla. Study participants were selected through convenience sampling method. 50 patients who were clinically diagnosed as having acute appendicitis and were posted for emergency appendicectomy, were enrolled in the study. The patients were evaluated by detailed history taking, clinical examination, and investigations including complete hemogram, and ultrasonography.

Inclusion Criteria

All patients above the age of 10 years diagnosed clinically to have acute appendicitis and subjected for appendicectomy in IGMC Shimla, were included in this study.

Exclusion Criteria

1. Patients with co-morbid conditions were not included in the study.
2. Patients who were managed conservatively were also excluded from the study.
3. Patients admitted for interval appendicectomy following appendicular mass, previously treated conservatively, were also excluded from the study.
4. Concomitant conditions where total leukocyte count is elevated e.g. Rheumatoid arthritis, SLE, TB, Gout, inflammatory bowel disease, glomerular nephritis etc, were also excluded.

Detailed history was taken in every case with emphasis on symptoms like pain abdomen, shifting of pain, nausea & vomiting, anorexia, and fever. Signs of peritoneal inflammation like right iliac fossa tenderness, rebound tenderness, guarding, and rigidity were elicited. Once the diagnosis of acute appendicitis was suspected, the patients

¹Senior Resident, Department of Plastic Surgery, PGIMER, Chandigarh, ²Associate Professor, Department of Community Medicine, Dr YS Parmar Government Medical College, Nahan, Himachal Pradesh- 173001, India

Corresponding author: Dr Renu Chauhan, Department of Community Medicine, Dr YSP GMC, Nahan, Himachal Pradesh, India

How to cite this article: Rajesh Kumar, Renu Chauhan. Clinico-epidemiological profile of acute appendicitis in a tertiary care hospital in North India. International Journal of Contemporary Medical Research 2020;7(7):G7-G10.

DOI: <http://dx.doi.org/10.21276/ijcmr.2020.7.7.28>



were subjected to routine laboratory investigations and ultrasonography as per hospital protocol.

Consent and Ethical Issues

The hospital ethical committee clearance was obtained prior to undertaking the study. The study subjects were informed about the study in detail and their informed consent was obtained. Confidentiality of the study subjects was maintained.

STATISTICAL ANALYSIS

The data collected were entered and analysed using the SPSS statistical software (version 16.0). Quantitative variables were presented as mean and standard deviation. Qualitative variables were presented as proportions.

RESULTS

The present study was performed on 50 patients who were clinically diagnosed as cases of acute appendicitis and were posted for emergency appendicectomy in the Department of General Surgery of Indira Gandhi Medical College, Shimla. The following observations were made in the study.

Age Distribution of Study Subjects

The age of the patients ranged from 11 years to 63 years, with a mean age of 26.48 ± 12.28 years. The maximum number of patients were in the age group of 10- 20 years (42%), followed by the age group 21-30 (28%). The least number of patients were seen in patient of age group >50 years (4%). (Figure -1)

Gender Distribution of Study Subjects

In the present study, out of 50 cases, 29 (58%) cases were males, and 21 (42%) cases were females as shown in (Figure-2). The male to female ratio in the present study was 1.4:1. In males most common age group of presentation of acute appendicitis was between 10- 20 years of age (22%), followed by the age group 21-30 years (20%), 31- 40 years (10%), 41- 50 years (4%). The same pattern of age distribution was seen among females, with the highest incidence in the lower age groups: 10-20 years (20%), 21- 30 years (8%), 31- 40 years (8%), 41- 50years (4%). (Table-1)

Prevalence of Symptoms of Acute Appendicitis: All the 50 patients complained of pain in the right iliac fossa. Migration of pain to RIF was reported by 35 (70%) patients. 30 (60%) patients reported pain on coughing, while 40 (80%) complained of anorexia, and 41 (82%) nausea and vomiting. History of fever was given by 11 (22%) patients (Table-2) (Figure-3).

Prevalence of Signs of Acute Appendicitis: All 50 (100%) patients presented with tenderness, rebound tenderness 35 (70%), guarding (64%). The prevalence of different signs of acute appendicitis is depicted in Table- 3.

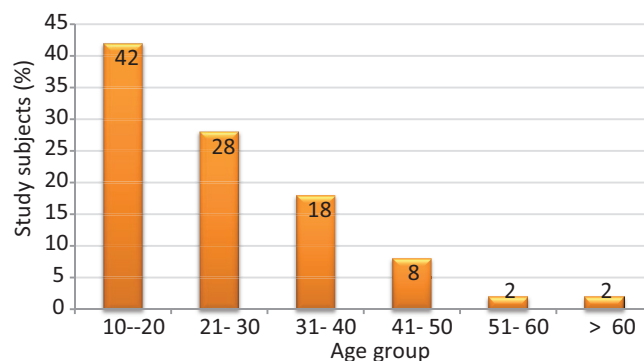


Figure-1: Age distribution of study subjects

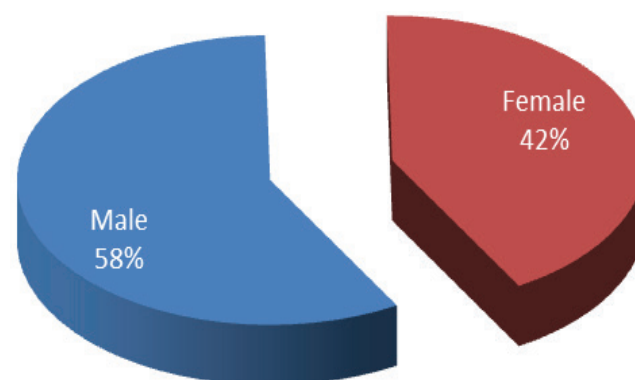


Figure-2: Sex distribution of study subjects

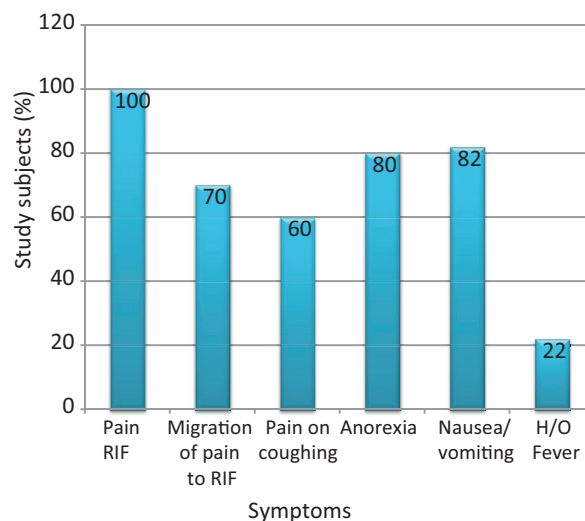


Figure-3: Prevalence of symptoms of Acute Appendicitis

Age distribution	Male	Female	Total (N)	Percentage
10- 20	11	10	21	42
21- 30	10	4	14	28
31- 40	5	4	9	18
41- 50	2	2	4	8
51- 60	1	0	1	2
> 60	0	1	1	2
Total	29	21	50	100

Table-1: Age and Sex distribution of study subjects

Sr No.	Symptoms	No. of cases (Total= 50)	Percentage (%)
1	Pain RIF	50	100
2	Migration of pain to RIF	35	70
3	Pain on coughing	30	60
4	Anorexia	40	80
5	Nausea / vomiting	41	82
6	H/O Fever	11	22

Table-2: Prevalence of symptoms of acute appendicitis

Sr No.	Signs	No of Cases (Total = 50)	Percentage (%)
1	Pulse (>90)	36	72
2	Temperature (>37.5 ° C)	9	18
3	Tenderness	50	100
4	Rebound tenderness	35	70
5	Guarding	32	64
6	Rigidity	3	6
7	Rovsing's sign	18	36
8	Psoas sign	23	46
9	Obturator sign	11	22
10	Dunphy's sign	30	60
11	Baldwin's sign	4	8

Table-3: Distribution of signs of acute appendicitis among the patients

Distribution of Cases as per Histopathology Report

In the present study 43 (86%) cases were found to be positive and 7 (14%) cases were negative on histopathology for acute appendicitis. Therefore, the rate of negative appendicectomy in the present study is 14%.

Also, it was seen that negative appendicectomy rate was higher in females(8%) as against males (6%). Among males the negative appendicectomy rate was 10.34%, while among females it was 19.05%

DISCUSSION

Appendicitis is the most common cause of acute abdomen requiring surgery. Prompt diagnosis is necessary as delayed diagnosis may lead to increased morbidity and mortality due to complications like perforation, gangrene, and phlegmon formation. A high diagnostic accuracy is required as negative appendicectomy carries significant morbidity like wound sepsis, intestinal obstruction, and infertility in females, etc.⁷ The present study was performed in Department of General Surgery, Indira Gandhi Medical College, Shimla, on 50 patients who were clinically diagnosed as cases of acute appendicitis.

Age and sex distribution

In our study, the mean age of patients was 26.48 (SD ± 12.28) years. The maximum number of patients presented in the age group of 10- 30 years (70%). This is because there are more lymphoid follicles in this age group. The least number of patients were seen in patient of age group >50 years (4%). Guraya et al⁸ reported the mean age of patients with acute appendicitis to be 23.7 yrs, while Cardall et al⁹ reported a mean age of 30.8 yrs, and West et al¹⁰ reported it to be 26.5

yrs. According to Kamran et al¹¹ mean age was 20.9 yrs, and the commonest age group was 13- 25 yrs (73%). Lateef et al¹² reported 12- 30 yrs (78.8%) as the most common age group for acute appendicitis.

Out of 50 patients, 29 (58%) were males, and 21 (42%) were females, so male predominance is seen in the present study. Similar male predominance has been reported by Saeed Abu- Eshy¹³ (Males 66%, Females 34%), Nasir Ali et al¹⁴ (Males 80%, Females 20%), Haider Kamran et al¹¹ (Males 58%, Females 42%), and Dholia et al⁷ (Males 76%, Females 24%).

Symptoms and signs

Clinical evaluation is of paramount importance in diagnosis of patient with suspected acute appendicitis. Diagnostic accuracy rates vary according to the patient population as well as the experience of surgeon. Diagnostic accuracy is quite high in young adult males and considerably poor at extremes of age i.e. in children and elderly patients.¹⁵ The greatest diagnostic challenge appears in females of child bearing age in their 3rd to 4th decade of life where it can mimic pelvic inflammatory disease and other gynaecological conditions like Mittelschmerz, ectopic pregnancy, torsion or rupture of ovarian cyst and endometriosis.

Pain right iliac fossa is the most common symptom in the present study (100%), followed by migration of pain reported by 35 (70%) patients. 40 (80%) patients complained of anorexia and 41 (82%) nausea and vomiting. History of fever was given by 11 (22%) patients. Similar findings have been reported by Singh AS et al¹⁶, where pain in abdomen and nausea was present in all the cases (100%), followed by vomiting (86.67%) and fever (73.33%) of cases. Similarly, Tauro LF et al¹⁷ have reported pain abdomen (100%), vomiting (91%), fever (37%). Gulzar S et al¹⁵ reported pain to be the most common presenting symptom present in all their study participants (100%), followed by nausea (94%), anorexia (87%), and pain on coughing (88%).

Tenderness in right iliac fossa was present in all patients in our study (100%), while rebound tenderness was present in 35 (70%). Guarding was present in 64%, rigidity (6%), Rovsing sign (36%), Psoas sign (46%), Obturator sign (22%), and Dunphy sign (60%), respectively. Tachycardia was present in 72% patients, while fever was documented in 18% cases. Tauro LF et al¹⁷, have reported RIF tenderness (100%), rebound tenderness (65%), guarding (23%), and tachycardia (79%). Gulzar S et al¹⁵ reported RIF tenderness (92%), rebound tenderness (72%), muscle guarding (43%), Rovsing sign (55%), Psoas sign (50%), and Obturator test (23%), cases.

Clinical diagnosis was found to be correct in 86% (43) cases and hence the rate of negative laparotomies for acute appendicitis in our study is 14% (7). Among the 7 patients with negative appendicectomy, 4 were females and 3 were males. Out of them, 2 had pelvic inflammatory disease, 2 mesenteric adenitis, 1 meckels diverticulitis, 1 ovarian cyst, and 1 patient had regional ileitis. According to literature, accuracy of clinical examination ranges from 71 to 97%¹⁵,

depending on experience of operating surgeon.

Out of 7 patients who were HPE negative, 4 (57.14%) were females and 3 (42.86%) were males. The negative appendectomy rate among males was 10.34%, and among females was 19.05%. Thus, a higher NAR among females was observed in this study. This observation is supported in study by Gulzar S et al.¹⁵ In their study on 160 patients (98 males, 62 females), they found 13(8%) appendices to be normal based on histopathology. Out of these 13 cases, 8 (61.5%) were females and 5 (38.5%) were males. In a study by Dholia et al⁷, out of 200 cases histopathological reports showed that 20 specimen were normal while 180 specimen were inflamed appendix. The negative appendectomy rate was 10%, out of which 14 (70%) were females and 6 (30%) were males. In a study by Memisoglu et al¹⁸, out of 196 cases, histopathological reports showed that 34 appendix were normal, and negative appendectomy rate (NAR) was 17.3%, out of which 20 (58.82%) were females and 14 (41.18%) were males.

The diagnostic accuracy of acute appendicitis in females is low because of conditions like pelvic inflammatory disease, ectopic pregnancy, and ovarian cyst, etc. that can mimic appendicitis and hence complicate the diagnosis.

CONCLUSION

Our study shows that there is a predominance of acute appendicitis among young male patients in second and third decade of life. The most common symptoms were pain abdomen, anorexia, nausea, and vomiting. The most common signs were tenderness, rebound tenderness and guarding. Clinical diagnosis was found to be accurate in 43 (86%) of cases and the rate of negative laparotomy for acute appendicitis in our study is 14%.

REFERENCES

1. Saeed K, Mehboob F, Azam V. Role of abdominal sonography in the diagnosis of acute appendicitis. *RMJ*. 2009;34:138-40.
2. Kakande I, Kavuma J, Kampala E. Alvarado Score. *Afr Med J*. 1978;55:172- 6.
3. Schwarz A, Bolke E, Peiper M, Schulte EJ, Steinbach G, van Griesven M, Orth K. Inflammatory peritoneal reaction after perforated appendicitis: continuous peritoneal lavage versus non lavage. *Eur J Med Res*. 2007;12:200-5.
4. John H, Neff U, Kelemen M. Appendicitis diagnosis today: clinical and ultrasonic deductions. *World J Surg*.1993;17: 243-9.
5. Addiss DG, Shaffer N, Fowler BS, Tauxe RV. The epidemiology of appendicitis and appendectomy in the United States. *Am J Epidemiology*.1990;132:910-25.
6. Lewis FR, Holcroft JW, Boey J, Dunphy JE. Appendicitis: A critical review of diagnosis and treatment in 1,000 cases. *Arch Surg*.1975;110:677-84.
7. Dholia KR, Baloch I, Shaikh SA, Soomro SH, Abro A. Total and differential leucocyte count (TLC and DLC) in cases of acute appendicitis. *Medical Channel*. 2010;16:284-6.
8. Guraya YS, Al-Tuwaijri TA, Khairy GA, Murshid KR.

Validity of leukocyte count to predict the severity of acute appendicitis. *Saudi Med J*. 2005;26:1945-47.

9. Cardall T, Glasser J. Clinical value of the Total White Blood Cell Count and Temperature in the Evaluation of patients with Suspected Appendicitis. *Acad Emerg Med*. 2004;11:1021- 7.
10. West WM, Brady- West DC, McDonald AH, Hanchard B, Fearon- Boothe. Ultrasound and white blood cell counts in suspected acute appendicitis. *West Indian Med J*. 2006;55:100-2.
11. Kamran H, Naveed D, Nazir A, Hameed M, Ahmed M, Khan U. Role of Total Leucocyte Count in diagnosis of Acute Appendicitis. *J Ayub Med Coll. Abbottabad*. 2008;20:70- 1.
12. Lateef AU, Arshad AR, Misbah J, Hamayun M. Role of leucocyte count in the diagnosis of acute appendicitis. *Gomal Journal of Medical Sciences*. 2009;7:140-2.
13. Eshy A. Predictive value of leukocyte count in acute appendicitis as seen in ASIR Central Hospital. *JHGID*. 1997;5:1-5.
14. Ali N, Rasul S, Mehmood Z, Inamullah, Khan A. Value of Total Leucocyte Count and C- Reactive Proteins in the Diagnosis of Acute Appendicitis. *Journal of Surgery Pakistan (International)*. 2009;14:153-6.
15. Gulzar S, Umar S, Dar GM, Rasheed R. Acute appendicitis – Importance of clinical examination in making a confident diagnosis. *Pak J Med Sci* 2005;21: 125-32.
16. Singh AS, Singh SP. The study on clinical profile of acute appendicitis. *International Journal of Medical and Health Research*.2017;3:139-141.
17. Tauro LF, Premanand TS, Aithala PS, George C, Suresh HB, Acharya D, John P. Ultrasonography is still a useful diagnostic tool in acute appendicitis. *Journal of Clinical and Diagnostic Research*. 2009;3:1731-6.
18. Memisoglu K, Karip B, Mestan M, Onur E. The value of preoperative diagnostic tests in acute appendicitis, retrospective analysis of 196 patients. *World Journal of Emergency Surgery*. 2010;5:5.

Source of Support: Nil; **Conflict of Interest:** None

Submitted: 26-05-2020; **Accepted:** 16-06-2020; **Published:** 14-07-2020