

Determine the Prevalence of Perforated Appendicitis also Examine the Causes of this Disorder

NASEEBULLAH ZARKOON¹, ALLAUDDIN², DILEEP KUMAR³

¹Associate Professor

²Senior Registrar, Department of Surgery, Bolan Medical College Quetta

³Associate Professor of Surgery Ward-2, Jinnah Postgraduate Medical Centre Karachi

Correspondence: naseebullahzarkoon@gmail.com

ABSTRACT

Aim: To examine the prevalence of perforated appendicitis also determine the causes associated to this disorder among patients whom underwent appendectomy.

Study Design: Cross sectional/observational study

Place & Duration of study: This study was carried out at Department of Surgery, Bolan Medical College Quetta from 1st October 2017 to 31st September 2018.

Methods: A total of 210 patients of both genders whom had undergone appendectomy were included. Patient's ages were more than 12 years were included. Patient's detailed history including age, sex, socioeconomic status were examined after taking informed consent from all the patients. Causes of perforated appendicitis and its prevalence were examined, symptoms were also noted. Patients who were not willing to participate and whom had other abdominal disorders were excluded from this study.

Results: There were 135 (64.29%) males while rest 75 (35.71%) patients were females. Sixty eight (32.38%) patients were aged between 12 to 25 years, 121 (57.62%) patients had ages of 26 to 40 years, 21 (10%) patients were aged between 41 to 55 years. Seventy four (35.24%) patients had perforated appendicitis. Misdiagnosis by clinical examination was the most frequent cause of perforation found in 42 (56.76%) patients.

Conclusion: The prevalence of perforated appendicitis was high in our system and the most frequent cause of perforated appendicitis was Misdiagnosis by clinical examination.

Keywords: Perforated appendicitis, surgical treatment, Appendectomies, Causes, Symptoms

INTRODUCTION

Appendicitis is one of the most common diseases found in all over the world. Appendectomy is the most frequently performing surgery in hospital settings and approximately 10% of all surgical operations followed by appendectomy.¹ Appendicitis is commonly found in people having age range between 10 to 30 years and mostly observed in male population². According to the different researches regarding appendicitis, 7 to 8% population have appendicitis disorder³, and mostly patients are of middle age and young adult⁴. Approx six percent of patients have found acute appendicitis during their life time⁵⁻⁷.

In USA, 0.3 million patients suffer from appendicitis and treated by surgery, are registered yearly and mostly patients found adult and of middle ages.⁸ Worldwide, the rate of appendicitis is high in people having ages 16 to 22 years and estimated 233 out of 0.1 million people suffering with appendicitis. In mild type appendicitis may be treated with medication but in modest and severe incidences it may require surgical extraction of inflamed appendix by laparoscopy or open appendectomy procedure. Diagnosis of acute appendicitis in clinical examination is mostly with typical methods^{9,10}. The surgical diagnosis is mainly based on clinical examination and Lab findings. Therefore diagnostic inaccuracy may be caused and resulted 20% of prevalence of perforation and 2-30% rate of negative appendectomy¹¹.

Gangrene, appendicular mass, perforation, peritonitis and abscess are the major complications and happen if appendicitis is not treated timely and in proper manner. The life time risk for development of acute appendicitis in males and females is 8.6% and 6.7%¹². Appendicitis commonly

lead to perforation and other severe complications due to misdiagnosis by doctors or delay in reaching hospital. Perforated appendicitis rate is very high and it may lead to increase rate of mortality and morbidity as compared to non perforated appendicitis.

MATERIALS AND METHODS

This observational study was conducted at Department of Surgery, Bolan Medical College Quetta from 1st October 2017 to 31st September 2018 Two hundred and ten patients of both genders whom had undergone appendectomy were included. Patients were aged between 12 to 55 years. After taking informed consent from patients, detailed history of age, sex and socio-economic status were noted. Histopathology findings of all patients were noted regarding appendicitis. Causes of perforated appendicitis and its prevalence were examined, symptoms were also noted. Patient's undergone laparotomy and who were not willing to participate and who had other abdominal problems were excluded from this study. All statistical data was analyzed by SPSS 19.

RESULTS

In this study total 210 patients were included whom had undergone appendectomy. Out of all 210 patients 135(64.29%) patients were males and 75 (35.71%) patients were females. Sixty eight (32.38%) patients were aged between 12 to 25 years, 121(57.62%) patients had ages of 26 to 40 years, 21(10%) patients were aged between 41 to 55 years (Tables 1-2). Symptoms observed associated to appendicitis such as pain in right iliac fossa in 121(57.62%)

patients, tenderness had found in 29(13.80%) patients, elevated temperature had found in 37(17.62%) patients and vomiting and nausea in 23(10.95%) patients (Table 3).

By diagnostic findings, 74(35.24%) patients had found perforated appendicitis, 86 (40.95%) patients had inflamed appendicitis, 28(13.33%) had gangrenous, 13(6.19%) patients had normal appendix and 9(4.29%) patients had found acute on chronic appendicitis (recurrent appendicitis) (Table 4). Causes of perforated appendicitis were observed such as inaccurate diagnoses, afraid of surgical treatment, delay in reaching hospital as 30(54.55%), 15(27.27%) and 10(18.18%) respectively. P-value <0.05 was considered significantly. We observed the major cause of perforation was inaccurate diagnoses by clinical examination (Table 5).

Table 1: Frequency of genders (n=210)

Gender	No.	%
Male	135	64.29
Female	75	35.71

Table 2: Age-wise distribution of patients

Age (years)	No.	%
12 – 25	68	32.38
26 – 40	121	47.62
41 – 55	21	10.0

Table 3: Symptoms prevalence observed in patients

Symptoms	No.	%
Pain in right iliac fossa	121	52.94
Tenderness	29	11.76
Elevated temperature	37	20.59
Vomiting and nausea	23	14.71

Table 4: Diagnostic findings of patients

Findings	No.	%
Perforation	74	35.24
Inflamed	86	40.95
Gangrenous	28	13.33
Normal appendicitis	13	6.19
Acute on chronic appendicitis	9	4.2

Table 5: Causes observed for perforation (n=55)

Causes	No.	%
Inaccurate diagnosis	42	56.76
Afraid of operation	18	24.32
Delay in reaching hospital	14	18.92

DISCUSSION

Appendicitis is one of the most frequent diseases found in all over the world. Current study was conducted to determine the prevalence of perforated appendicitis and causes lead to perforation. In this study, 210 patients were included in which 64.29% patients were males while rest 35.71% patients were females, these results shows the similarity to some other studies regarding appendectomy in which males patient population was high as compared to females 50 to 70%.^{12,13} In the present study 68 (32.38%) patients were aged between 12 to 25 years, 121 (57.62%) patients had ages of 26 to 40 years, 21 (10%) patients were aged between 41 to 55 years, these results shows similarity to the other study conducted regarding appendicitis research¹⁴ in which rate of appendicitis was high in patients having ages between >20 to 40 years and

in our study mostly patients were ages between 26 to 40 years.

The diagnostic findings of present study showed that patients suffering from appendicitis, 74(35.24%) patients had foundwith perforated appendicitis, 86(40.95%) patients had inflamed appendicitis, 28(13.33%) had gangrenous, 13(6.19%) patients had normal appendix and 9(4.29%) patients had found acute on chronic appendicitis.(recurrent appendicitis) Main reason for perforation of appendicitis is obstruction in the lumen and the leading reason for luminal obstruction is fecolith and it causes 90% of perforated appendicitis. We observed that delay in reaching hospital is one of the major causes which lead to perforation of appendix as more time will pass the risk of complications tends to be high. In different multiple studies shows that the rate of these diagnostic finding varies between 68 to 100%¹⁵.

In the current study the leading cause of perforation was inaccurate diagnosis by doctors and recorded in 56.76% patients were misdiagnosed at first attempts, 18 patients were afraid of operation and 14 patients found delay in reaching hospital. A study conducted by Asad et al¹⁶ shows that 23.08% of patients were diagnosed inaccurately by expertise and sent them to OPD. It is most important that the diagnosis of this disease should be accurate and on time, and if misdiagnosed or not properly diagnosed can lead to perforation and may increase the mortality and morbidity rate¹⁷⁻¹⁹.

This study observed that symptoms such as pain in right iliac fossa in 121 (57.62%) patients, tenderness had found in 29 (13.80%) patients, elevated temperature had found in 37 (17.62%) patients and vomiting and nausea in 23 (10.95%) patients. A research conducted by Salahuddin et al²⁰ shows the similarity to our study. Another study resulted that non medical persons are responsible for delay in diagnosing appendicitis and this tends to increase the perforation appendicitis.²¹ Multiple studies shows that delay in surgical treatment of appendicitis tends to increase complications^{21,22}.

CONCLUSION

The prevalence of perforated appendicitis was high in our system due to misdiagnosis by clinical observation, delay in reaching hospital and afraid of surgical treatment. Expertise should have to diagnose attentively for decreasing the rate of perforated appendicitis, Also people must have to aware of this disease and urgent treatment.

REFERENCES

1. Khan MN, Davie E, Irshad K. The role of white cell count and C-reactive protein in the diagnosis of acute appendicitis. *J Ayub Med Col Abbotabad* 2004;16:51-55.
2. Shwartz SI. *Principle of surgery*. New York: McGraw Hill 1994; 1307-18.
3. Addiss DG, Shaffer N, Fawler BS. The epidemiology of appendicitis and appendectomy in the United State *Am J Epidemiol* 1990; 132:910-25.
4. Kadumba ES, Mabula JB, Rambau P, Chalya PL. Modified Alvarado scoring system as a diagnostic tool of acute appendicitis at Bugando medical centre. Mwanza, Tanzania. *BMC Surg* 2011; 11(1):1-5.

5. Jhadav A, Potdar A, Kalyanshetti A. Comparison between accuracy of Alvarado scoring and USG to diagnosis of acute appendicitis. *Int J Sci Res* 2016; 3(10): 445-53.
6. Ahmad AM, Vohra LM, Khaliq T, Lehri AA. Diagnostic accuracy of Alvarado score in the diagnosis of acute appendicitis. *Pak J Med Sci* 2009; 25:118-21.
7. Kemal M, Bora K, Metin M, Ender O. The value of preoperative diagnostic tests in acute appendicitis. *World J Emerg Surg* 2010; 5:1749-92.
8. Livingston EH, Fomby TB, Woodward WA, Haley RW. Epidemiological similarities between appendicitis and diverticulitis suggesting a common underlying pathogenesis. *Arch Surg* 2011; 146(3): 308-14.
9. Muhammad JS. Developing a new scoring system for diagnosis of appendicitis *J Pak Med* 2011;1(2):63-4.
10. Hlibczuk V, Dattaro JA, Jin Z, Falzon L. Diagnostic accuracy of noncontrast CT for appendicitis in adults. *Ann Emerg Med* 2010;55:51-9.
11. Horzic M, Salamon A, Kopljar M, Skupjak M, Cupurdija K, Vanjac D. Analysis of scores in diagnosis of acute appendicitis in women. *Coll Antropo* 2005;29:132-8.
12. England RJ, Crabbe DC. Delayed diagnosis of appendicitis in children treated with antibiotics. *Pediatr Surg. Int* 2006;22(6):541-5.
13. Soomro AG, Sidiqi FG, Abbro AH, Abro S, Sheikh NA, Memon AS. Diagnostic accuracy in acute appendicitis *JLUMHS* 2008;93-96.
14. Talukder DB, Siddique AKMZ. Modified Alvarado scoring system in the diagnosis of acute appendicitis. *JAFMC* 2009;5:18-20.
15. Keyzer C, Tack D, de Maertelear V, Bohy P, Gavenois PA. Acute appendicitis comparison of low dose and standard dose unenhanced multi-detector row CT. *Radiology* 2004;232:164-72.
16. Zinner MJ, Ashley SW Jr, Hines OJ. *Maingot's abdominal operations*. 13th Ed Philadelphia: Elsevier, 2010; 1258-62.
17. Asad S, Ahmad A, Ahmad S, Ghaffar S, Khattak ID. Causes of delayed presentation of acute appendicitis and its impact on morbidity and mortality. *J Ayub Med Coll. Abbottabad* 2015;27(3):620-3.
18. Khalil J, Muqim RU. Impact of delay in acute appendicitis. *Pak J Surg* 2010; 26(1):31-5.
19. Jalil A, Shah SA, Saaiq M, Zubair M, Riaz U, Habib U. Alvarado scoring system in prediction of acute appendicitis. *J Coll Physcian Surg Pak* 2011;21(12):753-5.
20. St Peter SD, Aguayo P, Fraser JD, Keckler SJ, Sharp SW, Leys CM, et al. Initial laparoscopic appendectomy versus initial non-operative management and interval appendectomy for perforated appendix with abscess: a prospective, randomized trial. *J Pediatr Surg* 2010;45(1):236-40.
21. Salahodin O, Malik MA, Sajid MA. Acute appendicitis in the elderly. *Pakistan Ordinance Factories Hospital Wah Cantt experience*. *J Pak Med Assoc* 2012; 62(9):946-9.
22. Rasool AG, Obaid M, Akhter MA, Shehbaz L, Nasir S, Ali Z. To determine the factors that effects the delay in diagnosis of acute appendicitis, affecting the morbidity and mortality of patients. *Pak J Surg* 2016; 32(4):213-7.