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Original Research Article

An Observational Study on Acute Appendicitis in all Age Groups in a Tertiary Care Centre

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ABSTRACT

Background
Acute appendicitis is the most common abdominal emergency encountered in our tertiary care center. The incidence of acute appendicitis was found to be more common in males than in females with M:F ratio 3:2. Incidence of acute appendicitis was most common during the second decade of life (35%)

Aims and Objectives
The aim was to study acute appendicitis in all age groups. The objectives were to study the mode of presentation of acute appendicitis, to study age groups affected in acute appendicitis and to study treatment modalities of acute appendicitis.

Methods
The present observational study was conducted in a tertiary care center for the period of one and half years among 100 patients who came with right iliac fossa pain were selected randomly without any bias. The history and clinical examination with ALVARDO scoring were done. Post operative and intraoperative managements were also assessed, and they were managed either conservatively or surgically.

Results
The common age group found was 11-20 years (35%). 88% patients presented during the age group 11 - 40 years. Average duration of postoperative stay in the hospital was 1.5 days for laparoscopic appendicectomy and 3.3 days for open appendicectomy. 9 patients were managed successfully with conservative management with no recurrence of symptoms.

Conclusion
There is still debate over whether appendicectomy is a better course of action for treating acute appendicitis or conservative therapy. Nonetheless, cautious management of acute appendicitis can be safe and successful if specific selection criteria are followed.

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Keywords: Appendicitis, Murphy's sign, ALVARADO score

INTRODUCTION

Appendicitis is the inflammation of appendix. Most common abdominal emergency is acute appendicitis.[1] Appendicitis is most frequent between the ages of 10 and 20, however it can affect anyone at any age.[2] There is a male preponderance, with a male to female ratio of 1.4:1; overall lifetime risk in the United States is 8.6% for males and 6.7 percent for females.

Early identification and treatment are crucial for preventing the rapid progression of acute appendicitis to gangrenous alterations, which are linked to higher rates of morbidity and mortality.[3] Because of this, even in cases when the diagnosis is uncertain, the majority of surgeons occasionally choose for an early surgical intervention.[4] This is particularly true if there are no viable investigation methods. In these situations, delaying surgery in the event of a missed diagnosis will increase the risk of complications, whereas doing surgery as soon as possible may result in a normal appendicectomy.[5,6] One of the most satisfying diagnostic procedures for any doctor is taking a complete medical history and doing a comprehensive abdominal examination. As Bailey states, "A correct diagnosis is the hand maiden of successful operation".[7] "Acute appendicitis is one of the most common conditions that the surgeon is called upon to treat as an emergency," says Sir William Heneage Ogilvie. It necessitates the attending doctor's utmost competence and attention, as well as sound clinical judgement. So early diagnosis and treatment is the goal. There is no known method of prevention of appendix.

Even with the advancement of technology, the majority of cases of acute appendicitis are diagnosed clinically. A typical history is presented by the majority of patients. Classical clinical findings during examination will lead you to diagnosis of acute appendicitis. ALVARADO scoring system is most widely used to increase the accuracy of diagnosis which considers symptoms, signs, and blood investigations. USG abdomen is widely used radiological investigation modality to support clinical diagnosis.

When it comes to management of the acute appendicitis appendicectomy is the treatment of choice even today. In a setting where laparoscopy instruments and expertise are available, laparoscopic appendicectomy is being preferred but till date it could not be proven to be gold standard approach. Open appendicectomy is still being done widely. Very few cases can be successfully managed conservatively with intravenous antibiotics if diagnosed in early stages. Goal of this study was to study the clinical presentation of the patient of acute appendicitis in our tertiary care center, age distribution of patients and to study the modalities of treatment available in this tertiary care center.

AIMS AND OBJECTIVES

The aim was to study acute appendicitis in all age groups. The objectives were to study the mode of presentation of acute appendicitis, to study age groups affected in acute appendicitis and to study treatment modalities of acute appendicitis.

MATERIAL AND METHODS

This is an observational study, comprising of 108 patients of suspected acute appendicitis over a period of one and a half years, from which 100 patients were selected those who fulfilled inclusion criteria and 8 were excluded based on exclusion criteria. The patients on admission with suspected acute appendicitis were evaluated on the basis of Alvarado Scoring System after ruling out other causes of pain in abdomen like gynecological or obstetric pathology, right ureteric colic. Meckel's

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diverticulum, mesenteric lymphadenitis, regional ileitis, obstructed carcinoma of cecum with appropriate investigations.

Inclusion and Exclusion Criteria

All patients who came to surgical OPD at our tertiary care centre with complaints of acute pain in the right iliac fossa (RIF) with all age groups were included in the study without bias on random basis. The patients declining written informed consent, patients who were HIV, HBsAg and HCV positive, appendicular mass and appendicular abscess and all the patients other than acute appendicitis were excluded.

Study Procedure

The cases were subjected to a detailed clinical examination and as soon as provisional diagnosis of acute appendicitis was made, the presenting symptoms particularly regarding the duration, mode of onset and type of pain abdomen were recorded. Particular attention was paid to the history of previous illness, pasthistory of similar complaints, diet, and bowel habits. Additionally, two crucial tests were completed: an abdominal ultrasound and a total white cell count. The USG criteria for Acute appendicitis includes the following: appendix visualisation Diameter>6mm, Wall thickness> 3mm, Complex mass (echo poor, asymmetric), Irregular asymmetry, Loss of shape, Free fluid, Graded soreness across Mc Burney's point.

Alvarado scoring was noted, and patients score equal or more than 7 was taken for surgery immediately and for scores between 5 and 6 depending on clinical symptoms, signs and scan finding cases were posted for surgery (operative photographs shown below as fig 1, fig 2, fig 3). Those with Alvarado score 5 and less than 5 were managed conservatively. Patients with a score or 1-4 were considered unlikely to have acute appendicitis, those with a score of 5-6 have a possible diagnosis of acute appendicitis, not requiring urgent surgery and those with score of 7-9 were regarded as probable acute appendicitis.

Operative Photographs (delete if not necessary)

Figure 1: Inflamed appendix

Figure 2: Perforated appendix

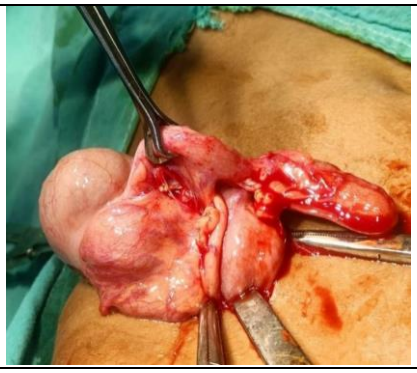

Figure 3: Impending perforation

RESULTS

In this observational study of 100 cases, all the patients who were presented with acute migratory pain in abdomen and diagnosed to have acute appendicitis were included. Out of 100 patients, maximum incidence of acute appendicitis is found in the age group 11 to 40 years amounting to 88% patients (table 1). With peak incidence during second decade of life accounting to 35%. Incidence reduced after 4th decade of life. Out of 100 patients studied, 60 % were male patients and 40 were female patients. With male to female ratio 3:2 (M:F = 3:2). All the patients presented with pain in abdomen. Pain was located to right iliac fossa (RIF) in all patients and 35% patients gave history of pain in periumbilical region. In 70% patients pain was colicky in nature and in 30%

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patients pain was dull in character. Migration of pain was experienced by 56%. Out of 100 patients of acute appendicitis studied in this study, 90% patients had anorexia, 82% patient had history of vomiting episodes, 32% patients had fever and only 5% patients had diarrhoea. 52 % patients had heart rate less than 90beats per minute and 48 % patients had heart rate more than or equal to 90 beats per minute. All 100 patients had tenderness over Mc Burney's point and 80% patients had rebound tenderness too (table 2). In our study patients with total count of more than 10,000/mmc were 68%. The Alvarado Score was 9-10 in 15 cases, 7-8 in 75 cases, 5-6 in 08 cases and <=4 was in only 2 cases (table 3). In present study, Abdominal ultrasonography was done of all patients to support clinical diagnosis (table 4). In 9% patients USG showed normal appendix, 29% patients had probe tenderness over RIF, inflamed appendix was seen in 56% patients and findings were s/o appendicular perforation in 5% patients. So, in overall 91% patients USG could show findings of acute appendicitis. And 10 patients could not be diagnosed acute appendicitis on abdominal sonography. Sensitivity of abdominal sonography was 95.6% and specificity was 90%. The table of distribution of patients by management shows that (table 5) 90 patients had score >= 7 all of them underwent surgery. 60 patients underwent open appendicectomy and 31 patients underwent laparoscopic appendicectomy. And 10 patients had score less than 7. Out of those 9 were managed conservatively and only one underwent open appendicectomy. In this study, 91 patients underwent surgery. Inflamed appendix was seen in 92.3% cases and perforated appendix in only 7.7% cases. Out of 100 patients studied 60 patients underwent open appendicectomy with average post operative days of stay in the hospital 3.3 days and 31 patients underwent laparoscopic appendicectomy with average post operative days of stay in the hospital 1.5 days.

Age in Years	Number of Patients	Percentage (%)
1-10	04	4.0
11-20	35	35.0
21-30	28	28.0
31-40	25	25.0
41-50	04	4.0
51-60	04	4.0
TOTAL	100	100

Table 1: Showing the Age Distribution

Signs	Number of Patients	Percentage
Mc Burney's tenderness	100	100.0
Rebound tenderness	80	80.0

Table 2: Distribution of Signs of Patients Studied

Alvarado Score	Total		Male		Female	
	No	%	No	%	No	%
<4	02	2.0	00	0.0	02	2.0
5-6	08	8.0	05	5.0	03	3.0
7-8	75	75	46	46.0	29	29.0
9-10	15	15	09	9.0	06	6.0
Total	100	100	60	60.0	40	40.0

Table 3: Distribution Alvarado Score of Patients Studied

Findings	Number	Percentage
Normal	09	9.0

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Probe tenderness over RIF	29	29.0
Acute appendicitis	56	56.0
Appendicular perforation	05	5.0
Other	01	1.0

Table 4: Distribution of Abdominal Ultrasonography Findings

Modality of Management	Number of Patients	Percentage
Conservative	09	9.0
Open appendicectomy	60	60.0
Laparoscopic appendicectomy	31	31.0

Table 5: Distribution of Patients by Management

DISCUSSION

The most frequent cause of acute abdomen in young adults is acute appendicitis. Appendicitis affects 6% to 7% of the general population at some point throughout their lives, with the frequency rising in the second decade. Throughout newborns, it is quite uncommon; throughout infancy and the early years of adulthood, it becomes more prevalent.[8] The common age group discovered in the current study was 35–40 years old. Patients between the ages of 11 and 40 made up 88% of the cases. Before puberty, the incidence of appendicitis is the same in males and females. The male-to-female ratio rises to 3:2 in teens and early adults. Approximately 7% of all individuals will have an appendix removed in their lifetime due to acute appendicitis; the lifetime risk of an appendectomy is 12% for men and 25% for women. The age range of 10 to 14 years old is the highest for boys with appendicitis, whereas the age range of 15 to 19 years old is the highest for females.[8,9] There were 40 female patients (40%) and 60 male patients (60%) in our research of 100 cases. Pain in abdomen is chief complaint. According to bailey pain first experienced around umbilicus. It is of less intensity and intermittent. As the disease progresses pain gets localised to right iliac fossa which is sharp and constant in nature. This localisation of pain to RIF is due to irritation of parietal peritoneum by severely inflamed appendix. This classical visceral- somatic sequence of pain is present in only half of those who have subsequently proven to have acute appendicitis. In this study, all the patients presented with pain in abdomen. Pain was located to RIF in all patients and 35% patients gave history of pain in periumbilical region. In 70% patients pain was colicky in nature and in 30% patients pain was dull in character. Migration of pain was experienced by 56%. 90% of the patients in this series had anorexia. Appendicitis almost always coexists with anorexia. 82% patients had episodes of vomiting, usually one or two episodes. 32% patients had fever at the time of presentation. Very few people came with complaint of loose stools along with RIF pain. According to Schwartz incidence is 75%. 90% of cases, according to research by D. Mike Hardin,[10] involve nausea, and 75% involve vomiting. Present series incidence is 82%. Out of 100 patients studied 52 % patients had heart rate less than 90 beats per minute and 48 % patients had heart rate more than or equal to 90 beats per minute.

The degree of fever is anticipated to be correlated with an elevated heart rate, which is mediated by the local and systemic synthesis of serum inflammatory mediators such interleukins and phospholipase A2.[11,12] After 24 hours from the start of symptoms, the heart rate quickly increased and remained high in all groups. The majority of patients experienced high-frequency tachycardia after 73 hours, which is consistent with the higher body temperature and septic condition of patients who had longer diagnostic intervals. In all 100 patients examined, right iliac fossa soreness was present, and this has been the most reliable indicator of acute appendicitis.

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In this study of 100 patients rebound tenderness was present in 80% patients. This is the sign of local peritoneal involvement. Owen Td et al[13] in his study mentioned that 60% patients will have rebound tenderness during the course of disease.

W.B.C. count more than 10.000 cells/ mmc was found in 68 % of cases. This scoring system is simple, fast, reliable, and repeatable, can be used in all conditions without expensive complicated supportive diagnostic methods.

In the study of Crnogorac S, Lovrenski J (2001) the score has a sensitivity of 87% and specificity of 60%.[14] In this study of 100 patients, Alvarado score was 9-10 in 15% patients, 7-8 in 75% patients, 5-6 in 8% patients and <= 4 in only 2% patients.

In our study, 90% patients had Alvarado score 7 or more. 91.7% of male were above 7 and 87.5% of females had a score above 7. In present study 9 patients were treated conservatively with antibiotics and followed up for a period of 6 months. No patient came with history of recurrence of symptoms during the follow up period. Eriksson and Granstrom[15] conducted the first prospective randomised research on medicinal therapy for acute appendicitis in 1995. In that pilot trial, 20 patients received antibiotic treatment while the other 20 underwent appendicectomies. Every patient in the medical therapy group was released from the hospital in less than two days, with the exception of one who needed surgery after twelve hours. Following diagnosis confirmation, seven patients experienced a recurrence and were operated on during the one-year follow-up period.[15] Out of 100 patients studied 60 patients underwent open appendicectomy with average post operative days of stay in the hospital 3.3 days and 31 patients underwent laparoscopic appendicectomy with average post operative days of stay in the hospital 1.5 days.

The length of hospital stay in recent studies show no significant difference between the groups.[16,17] Early studies from the 1990s showed that hospital stays for LA patients were much shorter,[18,19] but maybe this is one area where OA has caught up to laparoscopic methods. With the right staffing infrastructure, Lord and Sloane[20] shown that a 48-hour discharge strategy for OA could be put into place.

CONCLUSION

Acute appendicitis can occur any time during life period but incidence is highest during the 2nd to 4th decade of life with male preponderance (M:F=3:2). Almost all the patients present with pain in RIF with symptoms of acute appendicitis are anorexia, nausea/ vomiting, fever and diarrhoea in very few patients. The history and clinical examination with ALVARDO scoring were more diagnostic. Ultrasonography of abdomen was used to support the diagnosis in suspected acute appendicitis. Both procedures (open and laparoscopic appendectomy) are still being practiced actively deferring the choice to the preference of surgeon and patients. The use of conservative management to treat acute appendicitis compared to appendicectomy remains an area of dispute. However, with careful selection criteria, conservative management of acute appendicitis can be both safe and effective.

REFERENCES

[1] Addiss DG, Shaffer N, Fowler BS, Tauxe RV. The epidemiology of appendicitis and appendectomy in the United S Jmiol 1990;132(5):910-25.

[2] Murphy J. Two thousand operations for appendicitis, with deductions from his personal experience. Am J Med Sci 1904;128:187-211.

[3] Gupta A, Regmi S, Hazra NK, Panhani ML, Talwar OP. Clinically monitored delay-A valid option in cases with doubtful diagnosis of acute appendicitis. Indian Journal of Surgery 2010;72(3):215-9.

[4] Hoffmann J, Rasmussen OØ. Aids in the diagnosis of acute appendicitis. British Journal of Surgery 1989;76(8):774-9.

ISSN: 0975-3583,0976-2833 VOL15, ISSUE 09, 2024

[5] Ditillo MF, Dziura JD, Rabinovici R. Is it safe to delay appendectomy in adults with acute appendicitis? Annals of Surgery 2006;244(5):656.
[6] Andersson RE, Hugander A, Thulin AJ. Diagnostic accuracy and perforation rate in appendicitis: association with age and sex of the patient and with appendicectomy rate. The European Journal of Surgery 1992;158(1):37-41.
[7] Ellis BW, Paterson-Brown S. Hamilton Bailey's Emergency Surgery. British Journal of Surgery 2002;89(5):631-2.
[8] Maisel H. The position of the human vermiform appendix in fetal and adult age groups. The Anatomical Record 1960;136(3):385-91.
[9] Flum DR, Steinberg SD, Sarkis AY, Wallack MK. Appendicitis in patients with acquired immunodeficiency syndrome. Journal of the American College of Surgeons 1997;184(5):481-6.
[10] Hardin DM. Acute appendicitis: review and update. American Family Physician 1999;60(7):2027-34.
[11] Rivera-Chavez FA, Wheeler H, Lindberg G, Munford RS, O'Keefe GE. Regional and systemic cytokine responses to acute inflammation of the vermiform appendix. Annals of Surgery 2003;237(3):408-16.
[12] Grönroos JM, Forsström JJ, Irjala K, Nevalainen TJ. Phospholipase A2, C-reactive protein, and white blood cell count in the diagnosis of acute appendicitis. Clinical Chemistry 1994;40(9):1757-60.
[13] Owen TD, Williams H, Stiff G, Jenkinson LR, Rees B. Evaluation of the Alvarado score in acute appendicitis. J R Soc Med 1992;85(2):87-8.
[14] Elangovan S. Clinical and laboratory findings in acute appendicitis in the elderly. J Am Board Fam Pract 1996;9(2):75-8.
[15] Eriksson S, Granström L. Randomized controlled trial of appendicectomy versus antibiotic therapy for acute appendicitis. Br J Surg 1995;82:166-9.
[16] Chung RS, Rowland DY, Li P, Diaz J. A meta-analysis of randomized controlled trials of laparoscopic versus conventional appendectomy. Am J Surg 1999;177(3):250-6.
[17] Garbutt JM, Soper NJ, Shannon WD, Botero A, Littenberg B. Meta-analysis of randomized controlled trials comparing laparoscopic and open appendectomy. Surg Laparosc Endosc 1999;9(1):17-26.
[18] Attwood SE, Hill AD, Murphy PG, Thornton J, Stephens RB. A prospective randomized trial of laparoscopic versus open appendectomy. Surgery 1992;112(3):497-501.
[19] Frazee RC, Roberts JW, Symmonds RE, Snyder SK, Hendricks JC, Smith RW, et al. A prospective randomized trial comparing open versus laparoscopic appendectomy. Ann Surge 1994;219(6):725.
[20] Lord RV, Sloane DR. Early discharge after open appendicectomy. Australian and New Zealand Journal of Surgery 1996;66(6):361-5.