

ORIGINAL RESEARCH ARTICLE

Epidemiological Analysis of Appendicitis in a Rural Tertiary Care Hospital, Tamilnadu.

G. Mohandhas¹ & Vijayan M. S²

¹Associate professor, ²Professor, Department of Surgery, Dhanalakshmi Srinivasan Medical College, Perambalur, Tamil Nadu, India.

Abstract:

Aim: The aim was to study the 5-years of epidemiological analysis of acute appendicitis in a rural medical college, Perambalur, Tamilnadu. **Materials and Methods:** This is a retrospective study of patients who were admitted with a diagnosis of appendicitis over a period of 5 years excluding negative appendectomy cases. Totally, 1000 cases were diagnosed as an acute appendicitis, on clinical suspicion and investigations during this period. We reviewed and studied these cases regarding incidence of appendicitis in different age groups, sex, according to dietary pattern and seasonal trend. **Results:** Occurrence of appendicitis was the highest in the 11-20 years age group which constituted 30.92%. Followed by 21-30 years age group, which constituted 29.21%. The incidence of appendicitis between the age group 31 and 40 years constituted 19.40% while between 0 and 10 years age group was 4.26%. While between 41 and 50 years age group was 9.38%. And between 51 and 60 years age group was 3.84%. Followed by above 60 years age group, which constituted 2.99%. The youngest case recorded was 8 years of age and the oldest 72 years of age. In this study occurrence of appendicitis, the incidents are marginally higher in male (52.88%) than female (47.12%). The occurrence of appendicitis was peak in the spring and low in the winter (December to March). **Conclusion:** Acute appendicitis should be suspected irrespective of age, sex and socioeconomic status of individual. Age-specific occurrence, sex ratio of appendicitis gives the impression that epidemiologic features of acute appendicitis are different with worldwide data. It is difficult to diagnose appendicitis in young children, young women and elderly people. Total leukocyte count, urine microscopy, ultrasonography and computed tomography abdomen should be used as a diagnostic aid in doubtful cases in association with physical findings, but it does not replace the clinical skills of a general surgeon.

Keywords: Epidemiology, appendicitis, rural setup.

Introduction:

Appendicitis is the most common surgical cause of abdominal pain in worldwide [1,2]. Acute appendicitis has been reported throughout the year, but some particular months are associated with higher incidents [3]. Several researchers have suggested that the heterogeneous extrinsic factors such as gastrointestinal infection, [4-6] air pollution [7] and low fiber diet, during summer months could be contribute to the higher incidence of appendicitis [3,8]. Acute Appendicitis forms an important emergency in the day-to-day surgical

practice. It affects human beings irrespective of age, nationality and religion.

In United States, 250,000 cases of appendicitis are reported annually. The incidence of acute appendicitis has been declining steadily since the late 1940s, and the current annual incidence is 10 cases per 100,000 populations.

In Asian and African countries, the incidence of acute appendicitis is probably lower because of dietary habits of the inhabitants of these geographic areas.

Address for correspondence:

Dr . G. Mohandhas M.S.

Associate professor

Department of Surgery,

DSMCH, Medical College,

Perambalur [TN], India.

Email: newviihashospital@gmail.com

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Dietary fiber is thought to decrease the viscosity of faeces, decrease bowel transit time and discourage the formation of faecolith, which predispose individuals to obstructions of the appendiceal lumen [9].

The incidence of appendicitis gradually rises from birth, peaks in the late 10 years and gradually declines in the geriatric years. It is most prevalent in the 11-30-year-old age group [10]. In recent years, the number of cases in patients aged 31-40 has increased to 19.40% [11].

Despite the advances in diagnostic medicine and therapeutics, the accurate diagnosis of appendicitis and pain in the right iliac fossa remains a clinical challenge.

Over 120 years ago, the sequence of appendicitis - perforation - abscess formation and peritonitis were described and the literature is replete with reassessments of the criteria which should be used to reach an accurate diagnosis, yet each year many apparently normal appendices are removed. This is partly due to much other intra-abdominal pathology which may mimic appendicitis, especially in females in their reproductive years.

It is evident from reviewing the vast amount of literature published on disease processes in the appendix that it is difficult to diagnose appendicitis, especially in the very young and very old patients. Clinician must maintain a high index of suspicion in all age groups.

There are limited Indian studies regarding epidemiology of acute appendicitis and difficulties in diagnosis, so this study was done to throw more light on it.

Materials and Methods:

This is a retrospective study of patients attending surgical department and those admitted with a diagnosis of appendicitis over a period of 5 years in a rural medical college (DMCH), Perambalur, Tamilnadu. Exclusion criteria were negative appendectomy cases. All diagnosed cases of appendicitis managed either surgically or conservatively.

Conservative management (Oschner - Sherren regimen) mainly used for cases of appendicular mass and patient not willing for surgery.

Anesthesia: The patients were subjected to general anesthesia as well as spinal anesthesia as per need.

Incisions: Gridiron and lanz incisions were used in cases where diagnosis was definite, lanz incision

used in young girls for cosmetic purpose. Rutherford Morrison incision used where exposure was not sufficient. Lower Midline incisions used when diagnosis was in doubt, particularly in the presence of intestinal obstruction or when gynecological problems could not be ruled out.

Procedure: Appendectomy done in all, except in cases of appendicular mass.

In doubtful cases like females in reproductive age group, we took lanz incision and did appendectomy after appendix was found to be inflamed.

We treated 1000 cases diagnosed as acute appendicitis on clinical suspicion and investigations. These cases were operated, appendectomy carried out, and subsequent histopathological examination also confirmed the diagnosis. Appendicular mass patients were treated conservatively followed by interval appendectomy. In the case of perforated appendix with pelvic abscess, was managed with laprotomy, drainage of pus, and appendectomy. In the case of Mekel's diverticulum we did resection anastomosis. Postoperatively patients were treated with iv fluids, antibiotics and analgesics. Once bowel sounds were heard, oral feeds were allowed. Most of the patients had uneventful postoperative recovery. Mild infection of the wound was seen in about 10 cases. One patient developed enterocutaneous fecal fistula, who was having gangrenous appendix intraoperatively, which was managed medically and subsequently with right hemicolectomy by taking lower midline incision. Wound dehiscence was noted in one case, an obese individual and managed by regular dressing and secondary suturing.

Difficulties in diagnosis:

In this study, we faced diagnostic difficulties in three age groups of patients which were in young children, young women of children bearing age and in elderly people due to atypical presentation.

In these cases, we did compute tomography (CT) abdomen for the diagnosis.

Young children presented typically with features suggestive of gastro enteritis, high fever, vague abdominal pain. Inability of children to give an accurate history was also one of the factors causing difficulty in diagnosis.

In young women at times, it was difficult to rule out gynecological conditions. e.g. pelvic inflammatory diseases, salpingitis, twisted ovarian cyst, and ectopic pregnancy.

Table 1: Fractures scoring in patients

Features	Score
<i>Migration of pain</i>	<i>1</i>
<i>Anorexia</i>	<i>1</i>
<i>Nausea</i>	<i>1</i>
<i>Tenderness in right lower quadrant</i>	<i>2</i>
<i>Rebound tenderness</i>	<i>1</i>
<i>Elevated temperature</i>	<i>1</i>
<i>Leucocytosis</i>	<i>2</i>
<i>Shift of white blood cell count to left</i>	<i>1</i>
<i>Total Points</i>	<i>10</i>

Elderly patients presented with features suggestive of inflammatory bowel disease, intestinal obstruction. On examination, localization was poor, and tenderness in right iliac fossa was difficult to elicit [Table 1].

Observations & Results:

Table 2 : Age-wise distribution of patients

Age Group	Number of Cases	Percentage
0 - 10 years	40	4.26%
11 - 20 years	290	30.92%
21 - 30 years	274	29.21%
31 - 40 years	182	19.40%
41 - 50 years	88	9.38%
51 - 60 years	36	3.84%
>60 years	28	2.99%
Total	938	100.0%

Occurrence of appendicitis was the highest in the 11-20 years age group which constituted 30.92%. Followed by 21-30 years age group, which constituted 29.21%. The incidence of appendicitis between the age group 31 and 40 years constituted 19.40% while between 0 and 10 years age group was 4.26%. While between 41 and 50 years age group was 9.38%. And between 51 and 60 years age group was 3.84%. Followed by above 60 years age group, which constituted 2.99%. The youngest case recorded was 8 years of age and the oldest 72 years of age.

Table 3 : Gender-wise distribution of patients

Sex	Number of cases	Percentage
Male	496	52.88
Female	442	47.12
Total	938	100.0%

In this study occurrence of appendicitis, the incidents is marginally higher in male (52.88%) than female (47.12%).

Table 4: Distribution of patients according to Dietary pattern

Diet	Number of Cases	Percentage
Vegetarian	340	36.2
Mixed Diet	598	63.8
Total	938	100.0%

The occurrence of appendicitis was more in the mixed diet than vegetarians. Mixed diet constituted 63.8% while vegetarians constituted 36.2%.

Table 5: Seasonal variation

Season	Number of Cases	Percentage
Winter (Dec to Mar)	280	29.85
Summer (Apr to Jun)	246	26.23
Rainy (Jul to Sep)	252	26.87
Post-monsoon (Oct to Nov)	160	17.06
Total	938	100.0%

The occurrence of appendicitis was peak in the winter and at a low in the post-monsoon.

Discussion:

Despite diagnostic and therapeutic advancement in medicine, appendicitis remains a clinical emergency. In fact, this illness is one of the more common causes of acute abdominal pain [1]. The incidence of acute appendicitis is around 7% of the population in the United States and European countries. The higher incidence of appendicitis is believed to be related to poor fiber intake in such countries.

In our study, the annual incidence of appendicitis was 3.18 per 1000 per year in 1st year, 4.17 per 1000 per year in second and 3.85 per 1000 per year in 3rd years. Hence, it remained almost stable during the study period of 5 years. Same observation was noted by Pederson [12].

Majority of studies have shown that appendicitis is more common in persons taking poor fiber diet which we observed in our study where appendicitis was found to be more common in mixed diets, that is, in 598 cases (63.8%) and less common in individuals taking vegetarian that is 36.2%.

Study conducted by Al-Omran, Mc leod Institute for Clinical Evaluative Sciences, Toronto in 1998 on epidemiological features of acute appendicitis showed that appendicitis is more common in males, in those aged 11-20 years [13], but we found that appendicitis is common in males, aged 11-20 years.

In most of the studies, it is observed that appendicitis is common in the youngest age group which we also observed in our study where 938 cases (30.92%) of 11-20 years age group out of 290 cases and 274 cases (29.21%) of 21-30 years of age group.

Study conducted by Nuddeh, Sadigh, Ahmadnia of Iran University of Medical Sciences, Tehran in 2006 showed that appendicitis is more common in males, in those aged 21-30 years whereas in females the highest occurrence was observed in 11-20 years of age group [14]. But, in our study, 496 out of 938 cases were male while 442 cases were female.

In our study males and females are almost equally affected. Number of male cases were 64 (49.2%) out of 130 cases while no. of female cases were 66 (50.7%). Hence, male to female ratio was 0.96:1 which is in contrast to most of the studies quoting male predominance.

Seven years period study conducted by Gallerani, Boari of St. Anna hospital, Italy in 2004 showed seasonal variation of appendicitis with peak in summer and not in spring [15], but in our study occurrence of appendicitis was peak in winter (280 cases out of 938 cases) and low in post-monsoon (160 cases out of 938 cases). The classic form of appendicitis may be promptly diagnosed and treated. When appendicitis appears with atypical presentation, it remains a clinical challenge. In such cases, laboratory and imaging investigations CT Abdomen and diagnostic laparoscopy may be useful in establishing the diagnosis. In our study, we found diagnostic difficulties especially in cases of young children, young women of child bearing age and elderly persons mostly because of their atypical presentation of appendicitis. This same observation of diagnostic difficulty in such patients is quoted by many studies such as Rothrock and Pagane study, Paris and Klein [16, 17].

If left untreated, appendicitis has the potential for severe complications including perforation or sepsis and may even cause death.

Although many antibiotics control infections, appendicitis remains a surgical disease. In fact, appendectomy is the only rational therapy for acute appendicitis. It avoids clinical deterioration and may avoid chronic or recurrent appendicitis. The methods of diagnosis and management of appendicitis vary significantly among surgeons and medical centers according to the patient's clinical status.

Conclusion:

Acute Appendicitis should be suspected irrespective of age, sex, and socioeconomic status of the individual. Age-specific occurrence, sex ratio of appendicitis gives the impression that epidemiologic features of acute appendicitis are different with worldwide data. Appendicitis is more common in males, in those aged 21-30 years and in females, in those aged 11-20 years. Occurrence of appendicitis was high during the winter in the patients attending our Hospital which differs from worldwide data. Difficulties in diagnosis of appendicitis in young children, young women, and elderly persons are in a good agreement with other studies. The total

leukocyte count, urine microscopy ultrasound and CT abdomen should be used as a diagnostic aid in doubtful cases in association with physical findings, but it does not replace the clinical skills of the general surgeon.

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