

EPIDEMIOLOGICAL ANALYSIS OF APPENDICITIS IN A RURAL TERTIARY CARE HOSPITAL, TAMILNADU

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ABSTRACT

Aim: The aim was to study the 2-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 2 years excluding negative appendectomy cases. Totally, 469 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 31-40 years age group, which constituted 31.56%, followed by 21-30 years age group, which constituted 27.29%. The incidence of appendicitis between the age group 11 and 20 years constituted 20.68%, while between 51 and 60 years age group it was 8.32%. In first decade it was 4.48% and above 60 years age group it was 4.05%. The youngest case recorded was 8 years of age and the oldest was 72 years of age. In this study, the occurrence of appendicitis, the incidents were marginally higher in female (42.86%) than male (57.14%). The occurrence of appendicitis was maximum in the summer and low in the rainy season.

Conclusion: Acute appendicitis should be suspected irrespective of age, sex and socioeconomic status of the individual. Age-specific occurrence, sex ratio of appendicitis give 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.

Key-words: Epidemiology, appendicitis, rural setup.

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INTRODUCTION

Appendicitis is the most common surgical cause of abdominal pain world wide.^{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 pollution⁷ 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 population. In Asian and African countries, the incidence of acute appendicitis is probably lower because of dietary habits of the inhabitants of these geographic areas. 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 gediatric 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 was 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 many other intra-abdominal pathologies 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 the patients attending surgical department and those admitted with a diagnosis of appendicitis over a period of 3 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. The Rutherford Morrison incision used where exposure was not sufficient. Lower Midline incisions used when the 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 an appendectomy after appendix was found to be inflamed.

RESULTS

We treated 469 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 Meckel'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

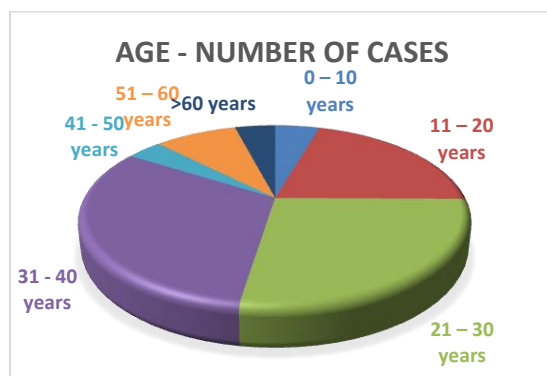
- In this study, we faced diagnostic difficulties in three age groups of patient which were in young children, young women of child bearing age and in elderly people due to atypical presentation.
- In these cases, we did computed tomography (CT) abdomen for the diagnosis.
- Young children presented typically 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.
- 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.

Age: Occurrence of appendicitis was the highest in the 31-40 years age group which constituted 31.56%, followed by 21-30 years age group, which constituted 27.29%. The incidence of appendicitis between the age group 11 and 20 years constituted 20.68% while between 51 and 60 years age group was 8.32%. In between

0 and 10 years age group it was 4.48% and above 60 years age group it was 4.05%, followed by between 51 and 60 years age group, which constituted 3.62%. The youngest case recorded was 8 years of age and the oldest 72 years of age. [Table 1].

Table – 1 : Age wise distribution of cases

Age Group	Number of Cases	Percentage
0 – 10 years	21	4.48
11 – 20 years	97	20.68
21 – 30 years	128	27.29
31 - 40 years	148	31.56
41 - 50 years	17	3.62
51 – 60 years	39	8.32
>60 years	19	4.05
Total	469	



Sex: In this study occurrence of appendicitis, the incidents is marginally higher in female (57.14%) than male (42.86%). [Table 2].

Table – 2 : Sex wise distribution of cases

Sex	Number of cases	Percentage
Male	201	42.86
Female	268	57.14

Dietary pattern: The occurrence of appendicitis was more in the mixed diet than vegetarians. Mixed diet constituted

53.52% while vegetarians constituted 46.48%.

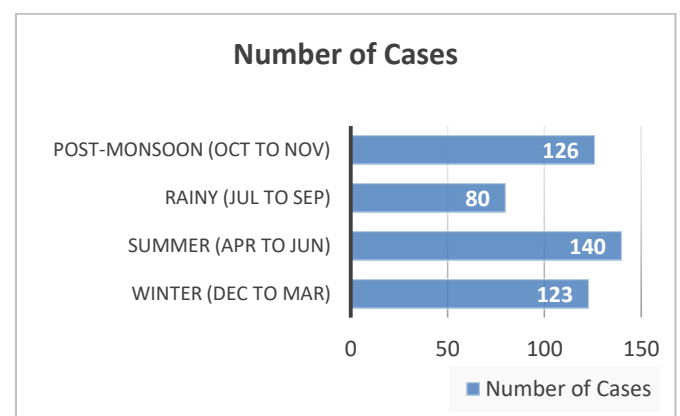
Table – 3 : Occurrence of appendicitis with Diet

Diet	Number of Cases	Percentage
Vegetarian	218	46.48
Mixed Diet	251	53.52

Seasonal trends: The occurrence of appendicitis was peak in the winter and at a low in the post-monsoon [Table 4].

Table – 4 : Seasonal variation in occurrence of appendicitis

Season	Number of Cases	Percentage
Winter (Dec to Mar)	123	26.23
Summer (Apr to Jun)	140	29.85
Rainy (Jul to Sep)	80	17.06
Post-monsoon (Oct to Nov)	126	26.87



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 year. Hence, it remained almost stable during the study period of 2 years. Same observation was noted by Pederson, Bru of Rogaland central hospital, Stavanger, Norway, in their study.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 251 cases (53.52%), and less common in individuals taking vegetarian that is 46.48%. Study conducted by Al-Omran, McLeod 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 in our study, we found that appendicitis is common in males, in those aged 31-40 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 469 cases (31.56%) of 31-40 years age group out of 290 cases and 274 cases (29.21%) of 21-30 years of age group were there.

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 469 cases were male while 442 out of 469 cases were female.

In our study males and females are almost equally affected. Number of male cases were 201 (42.86%) out of 469 cases while no. of female cases were 268 (57.14%). Hence, male to female ratio was 0.94:1 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 also in our study occurrence of appendicitis was peak in summer (140 cases out of 469 cases) and low in post-monsoon (126 cases out of 469 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 patients 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 give the impression that epidemiologic features of acute appendicitis are different with worldwide data. Appendicitis is more common in females, in those aged 31-40 years and in males, 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.

Conflict of Interest : None.

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