

APPENDICITIS: TRENDS IN AGE, SEX AND SEASONAL VARIATIONS IN PEDIATRIC SURGERY WARD OF CHITTAGONG MEDICAL COLLEGE HOSPITAL

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Summary

Appendicitis is a common clinical condition worldwide. Differences in incidences, age, sex and seasonal variations have been reported widely. To assess the trends in percentage (%) and variation with age, sex and seasons of the year. A review of the 5 years records (January 2008 to December 2012) of all patients with appendicitis treated in pediatric Surgery ward of Chittagong Medical College Hospital (CMCH) was evaluated. The age, sex and months of admission for all the cases of appendicitis were analyzed. There were 576 cases of appendicitis during the study period. Male to female ratio was 2.8:1. A continuous increase in number was noticed over the years and the number in 2012 was almost one and half times that of 2008. There were fewer cases in 2-5 years age group (38) and more in 6-12 years age group (538). Percentages of cases were higher in the period between October and December with peaks in October and March; and declining from the month of July. There is an increasing number of appendicitis in children in Chittagong Medical College Hospital. Appendicitis occurs more in early winter. Boys suffer more than the girls and 6-12 years is the commonest age of appendicitis.

Key words

Appendicitis; age; sex; seasonal variation.

Introduction

Appendicitis is the most common surgical cause of abdominal pain worldwide [1]. Differences in incidences, age, sex and seasonal variations have been reported widely. Appendicitis occurs less frequently in less industrialized countries [2].

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Over the past few decades the worldwide incidence has steadily decreased [2]. But report of increasing incidence in Bangladesh has been reported by some authors in last few decades [3]. Changing to a western life including diets is responsible for this [4].

The peak incidence is between ages 11 and 12 years. Although the disorder is uncommon in infants, perforated appendicitis can occur even in premature infants. Perforation may also be the end result of another disease process as seen in neonates with Hirschsprung's disease [2]. Boston children hospital showed most cases of appendicitis occur when a child/young adult is between the ages of 6 and 20. It is uncommon in children under four years, but the rate of perforation is high in this group since young children are unable to tell exactly how they feel and where it hurts [5]. A study from Dinajpur, Bangladesh showed that appendicitis is a disease of 2nd decade of life (42.1% patient presented between the age 11-20 years). They had also showed appendicitis are more common in male (male female ratio 1.8:1) [6]. It is generally reported to be more common in males [4]. Another study showed appendicitis occurs in equal numbers in boys and girls [5].

Appendicitis occurs more commonly on whites and during summer months [2]. But Ashley has reported an excess during spring implicating a high prevalence of viral infections among others during these months [4]. But Sanda et al have suggested intense challenge to the mucosa associated lymphoid tissue from allergen in the dust [7].

The aim of this retrospective study is to assess the trends in the incidence, and patterns of variation with age, sex and seasons of the year.

Materials and methods

Type of study: Retrospective study.

Place of study: This study was done in the department of Pediatric Surgery, Chittagong Medical College & Hospitals, Chittagong, Bangladesh.

Study period: January 2008 to December 2012 (Total 5 years).

Study population: Hospital records of all patients with appendicitis treated during the study period were scrutinized. Records missing age, sex, date of admission was not included.

Sample: Total 627 cases were recorded but 51 records were incomplete. Finally 576 cases of appendicitis was selected for the study (Sample size, n = 576)

Variables checked: The age, sex and months of admission for all the cases of appendicitis were retrieved and analyzed. The total number of hospital admissions for each year was obtained from the medical records of Pediatric Surgery ward. Age range checked and it was noted in what age appendicitis more common. Male and female patients were noted to assess common sex for appendicitis. Incidence of appendicitis was noted in each month to ascertain seasonal variation of appendicitis.

Data processing: Collected data was tabulated. Tables and figures were drawn and analysis was done.

Results

From a total of 28054 patients admitted in department of Pediatric Surgery, CMCH 627 cases were diagnosed as appendicitis during the observed period (January 2008 to December 2012). But 576 cases were selected for the study. n=576.

Age distribution: Fig 1 shows that the commonest age of appendicitis is between 6-12 years.

Age distribution: Out of them 426 was male and 150 were female. Male constituted 74% and male to female ratio was 2.8:1. Fig-1 Shows the age distribution of appendicitis cases.

Yearly distribution (Table 1 and fig 3): A continuous increase in number was noticed over the years and the number in 2012 was almost one and half times that of 2008. The values of appendicitis as a percentage of Pediatric Surgical admissions were 2.3, 2.06, 2.15, 1.67 and 2.19 respectively for the years 2008, 2009, 2010, 2011 and 2012. Fig 2 shows appendicitis affect male sex more than female.

Table-I shows the distribution by year, total hospital admission and total pediatric surgical admission and

There were fewer cases in 2-5 years age group (38 cases) and more in 6-12 years age group (538 cases). Fig 3 shows the yearly trends of appendicitis.

Monthly distribution (Fig 4 and 5): Percentages of cases were higher in the period between October and December with peaks in October and March; and declining from the month of July. Fig 4 shows the seasonal variations in occurrence of appendicitis and Fig 5 shows the monthly variations in occurrence of appendicitis.

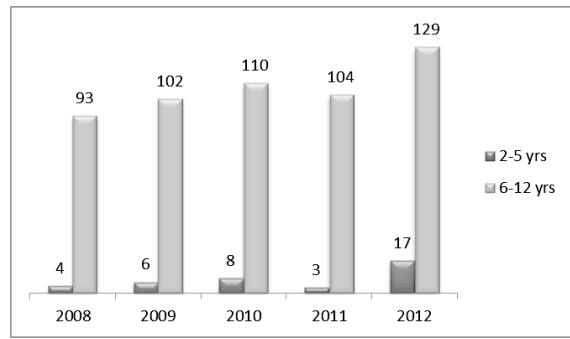


Fig 1: Age distribution.

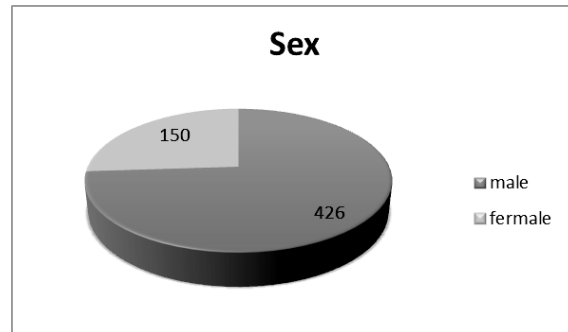


Fig 2 : Sex distribution.

Table I : Distribution by year, total hospital admission and total pediatric surgical admission.

Year	Total no Appendicitis cases	Total no Hospital admission	Percentage of total hospital admissions	Total pediatric surgical admissions	Percentage of total pediatric surgical admissions
2008	97	111753	0.09	4226	2.3
2009	108	114830	0.09	5236	2.06
2010	118	130394	0.09	5501	2.15
2011	107	139424	0.08	6419	1.67
2012	146	132697	0.11	6672	2.19
Total	576	629098	0.09	28054	2.05

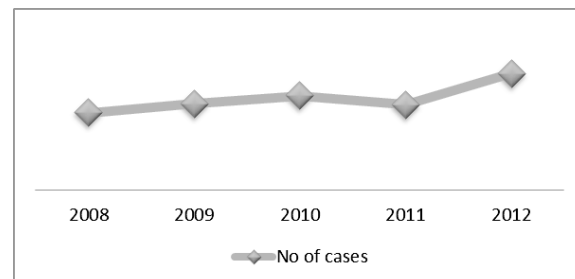


Fig 3 : Yearly trends of Appendicitis.

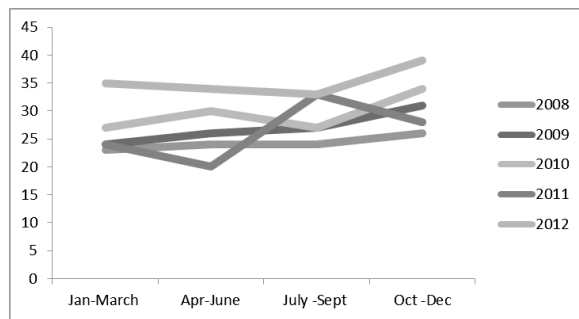


Fig 4 : Seasonal variations in occurrence of appendicitis.

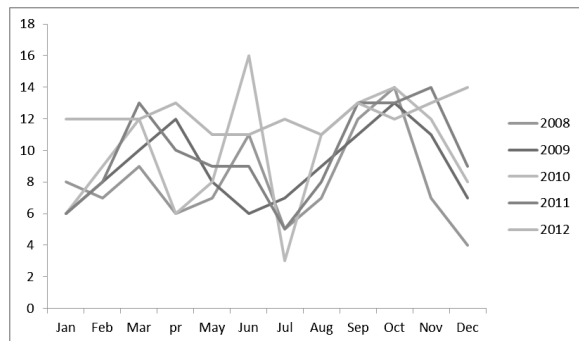


Fig 5 : Monthly variations in occurrence of appendicitis.

Discussion

The incidence of appendicitis varies substantially by country, geographical region, race, age and seasons [4,7,8]. The finding of an increasing incidence in this study is in contrast to the common finding of reducing incidence in larger part of developed world [8,9]. The predisposing factors to appendicitis are thought to be multifactorial ranging from dietary, age, genetic predisposition; viral and bacterial infections [10]. Vascular disorders and inadequate childhood breast feeding are also suggested by some authors [11]. The increasing number of 'fast food' restaurants where mainly high carbohydrate, low fiber diets, confectionaries and sweets could have contributed to the increase in the incidence [11]. The peak incidence occurs between the ages 11 and 12 years [2]. In our study more were at the stage between 6 to 12 years. Another study from Dhaka, Bangladesh found that 80% of appendicitis occurs between the age 5 to 12 years which is as like as our study [12].

Most authors reported a higher incidence in males [8]. The distribution had a similar pattern in both sexes according to some authors suggesting the non-influence of sex especially in adult cases [8,10].

In our finding male to female ratio of 2.8:1 suggests that the incidence is higher in male reflecting that male are more vulnerable. But Rahman and associates found that appendicitis occurs little more in Bangladeshi male (male female ratio 1.14: 1) [12].

Cases of appendicitis presents throughout the year but some particular months are associated with higher incidences, although this varies from region to region. Higher incidences are noted to be associated with summer months by many authors [7,8]. In our study the month of October to December presents a higher incidence with peak in August, September, October, and November. This is similar to the findings from California and Italy [10]. The presence of seasonal variation shows the possibilities of heterogeneous extrinsic factors such as humidity, allergens, sun radiation and viral and bacterial infections [10]. In another study Khaevel et al postulated the importance of actual reduction of sun radiation and vast fluctuation in air temperature may be the incidence of appendicitis [13]. Increase in the incidence of bacterial and viral infections (causing lymphoid hyperplasia leading to appendix lumen obstruction) and parasitic infestations during this period could also contribute to the higher incidence of appendicitis [10].

Conclusion

There is an increasing number of appendicitis in pediatric age group in Chittagong medical college hospital. Male are affected more than female. There was less number of cases in 2-5 years age group and more in 6-12 years age group. Appendicitis is more common during the beginning of winter.

Disclosure

All the authors declared no competing interest.

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