

ASSOCIATION OF SOCIOECONOMIC STRATA WITH FECOLITH IN ACUTE APPENDICITIS

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ABSTRACT

Objective: To determine the association of socioeconomic strata with fecolith in acute appendicitis.

Study Design: Case control study

Setting and Duration of Study: Department of Surgery Combined Military Hospital and the Military Hospital Rawalpindi, Six months from Jan 2008 to July 2008.

Patients and methods: 80 patients were included in study. Forty were from high social class and 40 from low social class. History and examination of each patient were noted, including monthly income. Appendectomy was performed under general anesthesia. Each resected specimen was examined for presence of fecolith and sent for histopathological examination.

Results: A total of 80 patients fulfilled the criteria of the study. Out of these 40 patients belonged to high social class and 40 patients belonged to low social class. Both the groups were comparable with respect to age ($p = 0.435$) and gender ($p = 0.104$) (Table-1 and 2). On naked eye examination fecolith was present in 20 (50%) patients of high social class and 9 (22.5%) patients of low social class ($p=0.011$). Odds ratio calculated was 1.759.

Keywords: Acute appendicitis, Fecolith, Fiber diet.

INTRODUCTION

Acute Appendicitis is one of the main differential diagnosis in acute abdomen which requires emergency surgery not only world wide but also in our country¹. Despite the fact that various advanced modalities for the diagnosis are available, the surgeon's clinical acumen is put to test in almost 30-40% of patient population². The diagnosis of acute appendicitis is made by the patient's history and physical examination along with few supportive investigations like the Total Leukocyte Count (TLC). Various scoring systems like Alvarado, Ohmann and Eskelinen score are available which aid in accurate diagnosis. Urgent appendectomy is the basis of management for acute appendicitis.

Appendicitis may be of obstructive or non obstructive type. In obstructive appendicitis fecolith obstructs the appendiceal lumen in approximately 35% of acutely inflamed appendices. It is a mass of inspissated faecal material that forms around a foreign body in the appendix, growing slowly with the

deposition of successive laminae, sometimes with calcification³. Fecolith are considered to be strong indicators of appendicitis and the complications of appendicitis⁴.

Acute appendicitis is commoner in urban society when compared with rural districts⁵. The high incidence in economically developed countries suggest that the change from a high to a low-residue diet is associated with increase fecolith and subsequent acute appendicitis⁶. It is rare in traditionally living Africans⁷ and Indians⁸. The disease incidence increases in Africans consuming Western diets.

This study was conducted to determine the association of socioeconomic strata with fecolith in acute appendicitis.

PATIENTS AND METHODS

This case control study was conducted in the Department of Surgery Combined Military Hospital and the Military Hospital Rawalpindi from January 2008 to July 2008.

A total of 80 patients fulfilled inclusion criteria, of which 40 were of high social class and 40 were of low social class. Patients unwilling for inclusion in the study were excluded. Permission from concerned authorities and 'Hospital Ethics Committee'

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was obtained. After taking informed consent from the patients, a detailed history and relevant examination of patients was carried out. In diagnosed cases appendectomy was performed under general anesthesia. The resected appendiceal specimen was given incision and carefully examined for presence of fecolith. The specimen was sent for histopathological examination.

Data recorded was analyzed by SPSS version 15. Mean and standard deviation (SD) were calculated for variables like age. Frequencies with percentages were presented for qualitative variables like gender, fecolith. Association of fecolith with socioeconomic class was studied using Chi Square Test. A *p* value < 0.05 was taken as significant.

RESULTS

A total of 80 patients fulfilled the criteria of the study. Out of these 40 patients belonged to high social class and 40 patients belonged to low social class. Both the groups were comparable with respect to age (*p* = 0.435) and gender (*p* = 0.104) (Table 1 and 2). On naked eye examination fecolith was present in 20 (50%) patients of high social class and 9 (22.5%) patients of low social class (*p*=0.011, OR=1.759) (Table-3). Odds ratio calculated was 1.759.

DISCUSSION

Acute Appendicitis makes the major bulk of present day emergency abdominal surgery and in majority of the cases puts the surgeon’s clinical judgment to a real test², especially in women, children and old age patients.

Acute appendicitis may be obstructive or non obstructive type. Various studies have shown that obstructive appendicitis is more common and fecolith is the main etiological factor in obstructive appendicitis. Fecolith have been identified by plain radiography, ultrasound, and computed tomography (CT) and at laparotomy.

Some studies have suggested that a positive family history increases the relative risk of being acute appendicitis nearly 3 times. Acute appendicitis is commoner in urban society when compared with rural districts⁵. The high incidence in economically developed

countries suggest that the change from a high to a low-residue diet is associated with increase fecolith and subsequent acute appendicitis⁶. This concept gave birth to a hypothesis named fiber hypothesis⁷. Various studies have been conducted to prove this.

The geographic distribution of appendiceal fecolith was investigated by systematic, intraoperative palpation of the appendix in patients in Toronto, Canada and Johannesburg, South Africa. The prevalence of fecolith was found higher in developed countries, such as Canada, than in developing countries, such as Africa⁹. Parents of 135 children with appendicitis and of 212 comparison children were interviewed about their children's diet. Children in the upper two quartiles of fiber intake were estimated to have a 3% lower risk of appendicitis than children in the lowest quartile. Estimated risk of appendicitis decreased as monthly intake of whole-grain foods increased. Children 7 to 18 years of age who had an intake of whole-grain foods in the

Table-1: Age wise distribution of patients of both the groups.

| Age groups | Social class of the patient | |
|------------|-----------------------------|---------------------------|
| | Low Social class (n =40) | High Social Class (n =40) |
| <= 20 | 13 (32.5%) | 18 (45.0%) |
| 21 - 35 | 13 (32.5%) | 14 (35.0%) |
| 36 - 50 | 11 (27.5%) | 7 (17.5%) |
| 51+ | 3 (7.5%) | 1 (2.5%) |

p value = 0.435

Table-2: Gender wise distribution in both the groups

| Gender of the patient | Social class of the patient | |
|-----------------------|-----------------------------|--------------------------|
| | Low Social class n=40 | High Social Class (n=40) |
| male | 29 (72.5%) | 22 (55.0%) |
| female | 11 (27.5%) | 18 (45.0%) |

p value = 0.104

Table-3: Association of fecolith and social class

| Fecolith on naked eye exam in appendix | Social class of the patient | |
|--|-----------------------------|--------------------------|
| | Low Social class (n=40) | High Social Class (n=40) |
| present | 9 (22.5%) | 20 (50.0%) |
| Absent | 31 (77.5%) | 20 (50.0%) |

p value = 0.011 OR =1.759

upper fiftieth percentile were estimated to have a 50% lower risk of appendicitis¹⁰. Burkitt and Trowell pointed out that communities with a high fiber diet have a low incidence of appendicitis, while those consuming a Western style diet, low in fiber and high in refined carbohydrates, have a higher incidence. The incidence of appendicitis in Japanese immigrants in Hawaii, where they presumably ate an American style low fibre diet, was higher than in Japan which confirm Burkitt and Trowell's theory that a low fiber diet causes a high incidence of appendicitis and hence fiber hypothesis¹¹. An Iranian study suggests a high rate of constipation in patients with lower fiber intake. The low fiber diet and subsequent constipation may predispose to acute appendicitis¹². Similarly a study conducted in 59 different areas of England and Wales showed that high fiber diet like fruits and vegetables gives protection against acute appendicitis possibly by altering bacterial flora¹³. In another study average daily fiber consumption was determined in 31 patients with acute appendicitis and in 30 control patients, matched for age and sex. The average daily dietary fiber intake was 17.4 g in the group with appendicitis and 21.0 g in the control group. The difference is statistically significant. The results support the hypothesis that diet, in particular a lack of fiber, may be an important factor in the pathogenesis of acute appendicitis¹⁴.

CONCLUSION

Fecolith is more common in high social class. Decreased dietary fiber intake may be associated with increase incidence of fecolith formation and subsequent acute appendicitis in high social class.

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