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RESEARCH ARTICLE

EPIDEMIOLOGICAL TRENDS IN ACUTE APPENDICITIS BASED ON SOCIOECONOMIC STATUS – A HOSPITAL BASED STUDY IN JODHPUR .

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Abstract

Many studies by different researchers have concluded that the less fortunate are more prone for diseases, same is applicable for acute appendicitis. This study was conducted in Jodhpur to assess the epidemiological trends in acute appendicitis relating to the socioeconomic status. 50 confirmed appendicitis patients were selected and grouped according to age, sex, area of residence and monthly family income. Monthly per capita income of family was calculated and subjects were segregated into income groups employing B.G Prasad's classification. Results obtained revealed male predominance and 11-20 years age group being the most affected. 84% of our subjects were of a low income group and out of these 91% were from a rural background. A curious observation was that all the females in our study were from a low income group.

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INTRODUCTION

Much has been written on appendicitis since it was described by Fitz more than 100 years ago¹¹, but the etiology and epidemiology of this disease remain poorly understood. Acute appendicitis has been attributed to a variety of possible causes, including mechanical obstruction,^{12,24} in-adequate dietary fiber intake,^{3,5,9} familial susceptibility,² factors associated with improved socioeconomic conditions,^{1,6} bacterial, Viral, and parasitic pathogens.^{4,7,18,21} Few population-based epidemiologic studies of appendicitis have been published however, and little is known about the demographic characteristics, geographic differences, seasonality, or longterm secular trends and socioeconomic influences.

The most widely accepted among all theories today is the diet and hygiene hypotheses.³¹ At the same time, these hypotheses have also formed the groundwork for epidemiological features of Acute Appendicitis. Both these hypotheses are related directly or indirectly to the socioeconomic status of population. Socioeconomic inequities have been studied by different authors in different healthcare fields of interest^{12,15,23,28} and their conclusions show that the less fortunate have more health issues. Although the data concerning this are still limited and those which are available are not concerning Indian scenario.

This short study was conducted in Department of Anatomy, Dr. S.N. Medical College, Jodhpur in association with Department of Pathology to assess the trend in acute appendicitis patients based on socioeconomic background.

Materials and methods

The present study was conducted in Department of Anatomy, Dr. S.N. Medical College, Jodhpur to assess epidemiological trends in acute appendicitis patients considering socioeconomic background.

50 histopathologically confirmed acute appendicitis cases were selected from the Department of Pathology. Those with negative appendicectomies, or for whom background data could not be collected were excluded from the study. Patient data were collected by direct interview with the patient or the patient attendant/guardian (in case the patient was not in a condition to give data and / or in case of a child patient) with consent from either and data were recorded concerning the age, sex, occupation and monthly income in a prefabricated standard proforma. Groups were made on the basis of age, sex and monthly income of individuals or family. Monthly income groups were formulated employing B.G. Prasad's Socioeconomic Status classification revised for May 2014 (Table I) .¹⁰

Formula employed for calculation of income was-

Per capita Income = Total income of family(monthly) / Total members in the family

Number of patients in each class was recorded and percentages were calculated. Similarly patients were grouped according to age and percentage was calculated from the sample size. According to age, patients were divided into groups with an interval of 10 yrs i.e. the groups were 1-10years, 11-20 years, 21-30 years and so on. Also a segregation of sample was done on basis of sex and percentage of patients of each sex was calculated.

Results

This study was carried out in Department of Anatomy, Dr. S.N. Medical College, Jodhpur to assess the general epidemiological trends of acute appendicitis in Jodhpur city of Rajasthan. It is a cross sectional study comprising of subjects chosen from the Department of Pathology which were histopathologically confirmed cases of acute appendicitis.

A total of 50 subjects were selected for the study out of which 30 were males and 20 females. There was a definite male predominance with males comprising of 60% of cases and rest 40% were females. This was a male to female ratio of 1.5:1. Age range of the subjects was from 12 years to 81 years with a mean age of 33.23 years. 11-20 years age group in our study was the largest group with 13 patients (26%) followed by 21-30 years group with 11 subjects (22%). Together these two age groups comprised of almost half the subjects. (Table II)

37subjects (74%) in our study were from a rural area. Out of a total of 20 women subjects 17 women (85%) were from rural area and only 3 (15%) were from an urban area. The ratio of rural subjects was lower in males with 20 males (66%) from rural area.(Table III)

In our study we calculated the per capita income of the family and subjects were grouped employing B.G. Prasad's classification.¹⁰ It was observed that 42 patients (84%) in our study were from groups III, IV, V which were low income groups. 34 subjects (91%) from rural areas were under low income groups while among the urban subjects 13 subjects (74%) were grouped under low income groups. A curious observation was that all the females presenting in the study, urban and rural alike were of a low socioeconomic strata. (Table III)

Table I
B.G. Prasad socioeconomic status classification 2014 update¹⁰

SES Class	January-2014	February-2014	March-2014	April-2014	May-2014
I	5410 and above	5433 and above	5458 and above	5522 and above	5571 and above
II	2705-5409	2717-5432	2729-5457	2761 -5521	2786-5570
III	1623-2704	1630-2577	1637-2728	1657 -2760	1671-2785

IV	812-1622	815-1629	819-1636	828-1656	836-1670
V	Below ` 812	Below ` 815	Below ` 819	Below ` 828	Below ` 836

Table II
Age wise distribution of patients

Age group	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90
No. of patients	0	13	11	6	5	7	5	2	1

Table III
Classification of urban and rural males and females into various income groups

Income group	Rural		Urban		Total
	Males	Females	Males	Females	
I	1	-	3	-	4
II	2	-	1	-	3
III	5	3	2	1	11
IV	5	7	3	1	16
V	7	7	1	1	16
Total	20	17	10	3	50

Discussion –

The present study was aimed at assessing the epidemiological trends of acute appendicitis relating to age groups, sexes and socioeconomic strata in population of Jodhpur district in Rajasthan state of India. This study was conducted in Department of Anatomy, Dr. S.N. Medical College, Jodhpur through a period of January 2014 - march 2014. In this study, 50 Subjects were selected from regular specimens received in Department of Pathology. Patient or concerning person was interviewed and data collected with consent.

In this study a total of 50 subjects were selected out of which 30 were males and 20 were females with a male:female ratio of 1.5:1 indicating a male predominance. This finding of ours is consistent with many studies which indicate a definitive male predominance although the ratio varies^{16,22,27} which can be attributed to the varying geographical and sociocultural areas and also probably the study design. Age of the patient is also seemingly important factor in acute appendicitis in our study since 48% of the subjects in our study were from age 11-20 years and 21-30 years. This finding of ours is in confluence with results in various studies which state that it mainly affects older children and young adults.^{20,22,27} No significant difference between both groups was seen in this study, although there were no infants or young children in our study which may be due to the limited time frame in which the study was conducted. Oldest patient was 81 yrs of age which is similar to many studies.

Although numerous epidemiological studies on appendicitis have been conducted worldwide, only a few studies have paid attention to the effect of socioeconomic status on appendicitis, particularly studies focusing on the low-income population.¹⁹ In our study we have grouped the subjects according to monthly per capita income employing BG Prasad's classification. Groups III, IV, V were considered to be low income groups, and it was observed that the individuals from these groups are more prone to the disease since 42 subjects of our sample (84%) belonged to the lower income groups, which makes it an important finding. Similar findings can be seen in studies conducted by Smink et al²⁶, Huang N et al¹³ and Rogers²⁵ while other studies by have reported no significant differences based on socioeconomic status.^{17,18} The rural subjects demonstrated a higher incidence of appendicitis compared to the urban group which is a finding similar as in a study by Huang N et al¹³

Most prevalent theory presently explaining incidence of appendicitis is the diet and hygiene hypothesis.³¹ Poverty, illiteracy, lack of basic hygiene facilities like toilets and inadequate healthcare facilities these are common problems in India, particularly in the rural areas where there is lack of even a decent source of drinking water in many areas let alone availability for cleaning and washing, this leads to grave hygiene problems. Compounding to this are certain social factors especially concerning females like lack of privacy etc., moreover due to poverty and illiteracy rural and urban low economic groups may exhibit dietary insufficiency also. These may be certain contributing factors for appendicitis along with the major problem of lack of sufficient medical health care and awareness.

Conclusion-

Older children and young adults are more prone for appendicitis. There is male predominance in appendicitis incidence. Low income groups exhibit higher appendicitis incidence and rural subjects are affected more with the disease. Socioeconomic disparity definitely plays a significant role in incidence of appendicitis, although the reasons may not seem directly related but have a strong impact on incidence and outcome of the disease. This study despite its limitations strengthens well placed belief of socioeconomic conditions governing incidence of appendicitis. This warrants further epidemiological study in the area to substantiate the findings which may be helpful in furthering the knowledge that we attain in field of appendicitis that till date has proven to be an elusive disease.

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