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Prevalence of Intestinal Parasitic Infestations Among Two Squatter Settlement Populations of Calcutta

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ABSTRACT Investigation on intestinal parasitic infestation has been carried out on 78 Hindu and 84 Muslim mothers, and on 91 Hindu and 97 Muslim children, living in a squatter settlement in Calcutta. The overall prevalence is higher among the Hindu mothers and children than their Muslim counterparts in general. But, the prevalence of *Ascaris lumbricoides* alone and in association with other intestinal parasites is higher among the Muslim mothers and children than their Hindu counterparts.

INTRODUCTION

Intestinal parasitic infestations is generally known to adversely affect the health status of human populations. It poses a major health problem in many Third World countries. Extensive surveys conducted by several workers in different parts of India, including West Bengal, suggest that intestinal parasitosis (helminthic and/or protozoal) have remained highly prevalent for long (Chandler, 1926a, b; Chowdhury and Schiller, 1968; Saxena and Prasad, 1971; Mathur and Kaur, 1974; Sengupta and Bhattacharya, 1975; Bhattacharya et al., 1987).

A number of factors are known to influence the prevalence of enteric parasitic infestations including physical environmental, sociocultural and socioeconomic (Beaver, 1961; Faust, 1931; Kochar et al., 1976; Picot and Benoist, 1975). In some studies, a relationship was found to exist between prevalence of intestinal parasitic infestations and the degree of urban contact (Bhattacharya et al., 1981; Bhattacharya et al., 1985). It has also been found that religion has no effect on the prevalence of intestinal parasitic infestations (Mukhopadhyay et al., 1993).

In view of this, the present study has been conducted on two social groups living in a sqatter settlement in Calcutta Metropoliton area, to investigate into the possibility of differences in respect of intestinal parasitic infestations, in relation to the micro-socioeconomic factors related to religion.

MATERIAL AND METHODS

The present study has been carried out during July-December 1995. The study populations reside in a squatter settlement in the Calcutta Metropolis, along the embankment of the canal stretching from Baghbazar to Beliaghata railbridge. The study populations comprise Hindus and Muslims migrated from different areas of South 24-Parganas district of West Bengal. The stretch selected for the study comprises Calcutta Municipal Corporation Wards 28 and 29, Canal East and West. This stretch has been selected because both the social groups reside here in adjacent clusters.

The study has been restricted to mothers between 20 and 40 years of age and children between 3 and 7 years of age. None of the subjects was suspected to have any parasitic infectations from clinical examination. The nature of study was explained to the people and faeces specimens were collected from willing individuals.

A total number of 350 faeces specimens were collected from mothers and children of both the groups. Out of the total number of speciments collected, 78 were from Hindu mothers; 84 from Muslim mothers and the rest, 91 and 97 specimens, from Hindu and Muslim children, respectively. The specimens were collected in plastic

containers in the morning, after administration of a laxative the evening before. All the specimens were processed in the laboratory within three hours of collection. The specimens were examined by direct saline/iodine preparations and by concentration techniques (Faust et al., 1938). No statistical sampling of households or individuals was attempted for obvious difficulties. Appropriate statistical techniques was applied in analysing the data.

RESULTS

The data presented in table 1 show that the frequency of individuals with "Nothing Abnormal Detected" (NAD) is low, *i.e.* the overall infestation prevalence is high. The same trend occurs both in the case of mothers and children.

Table 1 : Prevalence of intestinal parasites

Population	*N*	*Affected %*	*NAD%*	χ^2 *value (df=1)*
Hindu mother	78	82.05 (64)	17.95 (14)	0.54
Muslim mother	84	77.38 (65)	22.62 (19)	
Hindu children	91	82.42 (75)	17.58 (16)	0.28
Muslim children	97	79.38 (77)	20.62 (20)	

82.5% Hindu mothers and 77.38% Muslim mothers are found to be affected. The difference has been found to be statistically non significant at the 5% level. 82.42% (75) and 79.38% (77) of the Hindu and Muslim children, respectively are affected, but the difference is statistically non-significant at the 5% level.

Table 2 shows the prevalence of different types of intestinal parasites. It appears that the prevalence of *Ascaris lumbricoides* only (single helminth infestation) is the highest in all the four groups studied (Hindu and Muslim mothers, Hindu and Muslim children). A gradual decrease in the following order of combinations has been observed in all the four groups studied :*Ascaris lumbricoides* and other helminth(s), *Ascaris lumbricoides* and protozoa, *Ascaris lumbricoides* and at least one other helminth and at least one protozoon. Considering the major protozoal infestations, the prevalences of *Giardia lamblia* and *E. histolytica* are found to be low.

In table 3 the study populations are divided into two categories : (a) those affected with "*Ascaris lumbricoides* only" and "*Ascaris lumbricoides* with other helminths" (b) those not affected by them. It appears that the Muslim mothers are more affected (58.33%) than the Hindu mothers (52.56%). The difference is sta-

Table 3 : Prevalence of the combination "*Ascaris only*" and "*Ascaris* with other helminths" infestations

Population	*N*	*Affected %*	*Not affected %*	χ^2 *value (df=1)*
Hindu mother	78	52.56 (41)	47.44 (37)	0.54
Muslim mother	84	58.33 (49)	41.67(35)	
Hindu children	91	52.75 (48)	47.25(43)	1.59
Muslim children	97	61.86 (60)	38.14 (37)	

Table 2 : Prevalence of intestinal parasites, by type of parasite

Type	*Adult*		*Children*	
	Hindu% (n=64)	*Muslim% (n=65)*	*Hindu% (n=75)*	*Muslim% (n=77)*
Ascaris only	48.44 (31)	47.91(31)	44.00 (33)	55.84 (43)
Ascaris and other helminth(s)	15.63 (10)	27.69 (18)	20.00 (15)	22.08 (17)
Ascaris and protozoa	9.38 (6)	6.15 (4)	17.33 (13)	5.19 (4)
Ascaris, at least one other helminth and at least one protozoon	6.25 (4)	4.62 (3)	6.67 (5)	1.30 (1)
Trichuris only	1.56 (1)	3.08 (2)	2.67 (2)	5.19 (4)
Trichuris and *Giardia*	-	3.08 (2)	2.67 (2)	-
Giardia only	6.25 (4)	3.08 (2)	-	2.60 (2)
Giardia and *E. vermicularis*	1.56 (1)	-	-	-
E. histolytica only	9.38 (6)	4.62 (3)	5.33 (4)	7.79 (6)
E. histolytica and *Giardia*	1.56 (1)	-	1.33 (1)	-
Total (%)	100.01	100.01	100.01	99.99

tistically non-significant at the 5% level. The prevalence is higher among the Muslim (61.86%) than among the Hindu children (52.75%). The difference is statistically non-significant at the 5% level.

DISCUSSION

The study populations, migrants from different places of South 24-Parganas district of West Bengal were selected in view of their possible differences in micro-socioeconomic factors (involving health behaviour) related to religion. Both populations live in extremely unhygienic conditions which is manifested by overcrowding of dwellings, lack of sanitation facilities, poor ventilations and moist floor, etc. Most of the people use pit latrines erected on the canal or open space for defaecation.

Studies on intestinal parasitic infestations on squatter, slum and shanty town dwellers show a high prevalence of *Ascaris lumbricoides*. The prevalence of *Ascaris* was 63% among the squatter dwellers of Singapore (Kleevens, 1966). High intensity infection of *Ascaris* occurred in poorer parts of Seoul (Soh et al., 1973). High rate of *Ascaris* has also been found in a study on slum children of Malaysia (Kan, 1989). The generally high prevalence of *Ascaris* is thus a common characteristic of the low socioeconomic status groups, but the causation there of as well as of the religious-group difference remains to be investigated in concrete terms.

The present investigation shows an overall high prevalence of intestinal parasitic infestation. The prevalence of *Ascaris lumbricoides* is higher among the Muslim mothers and children, than their Hindu counterparts. This may be due to the differences in personal hygienic behaviour between the two groups.

Hookworm has been found only in two Hindu mothers and three Muslim mothers. Hookworm larvae are more likerly to survive in sandy soil than in clay soil. Clay soil is most suitable for *Ascaris* eggs to survive (Saxena and Prasad, 1971). This may be a possible explanation of low prevalence of Hookworm in the area compared to *Ascaris*. Another possible explanation is conscious use of footware in the urban populations (Sinha and Sahai, 1976). However, we have no data at present to test these possibilities.

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