

## A Note on Prevalence of Intestinal Parasitosis in a Coastal Zone of West Bengal

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**ABSTRACT** This note presents data on the prevalence of intestinal parasitic infestation, mainly helminths and protozoa, among six experimental villages in coastal West Bengal. The source of drinking water, i.e. depth of the tube well, is suggested to be a factor affecting the prevalence of the infestation.

### INTRODUCTION

Certain helminths and protozoa are known to be major pathogenic intestinal parasites, in addition to bacteria like *Shigalae*, *Salmonellae* etc. which are extremely pathogenic. Helminthic and protozoal infestations cause chronic health hazards, mainly anaemia, and malnutrition through malabsorption. These infestations are endemic in many parts of Asia, including the Indian region (May, 1958; Misra, 1970; Howe, 1977). Studies on these infestations were conducted thoroughly by Chandler as early as 1925, 1926, 1927; these studies covered many parts of the pre-partition Bengal. Subsequent studies (Saxena and Prasad, 1971; Bhattacharya, 1980; Bhattacharya et al., 1981, 1985, 1987) also suggest high prevalence of these parasitosis in many parts of India, including West Bengal.

The factors responsible for this high prevalence are generally known to involve sanitation, personal hygiene, settlement pattern, food habit and physical environment (May, 1958; Misra, 1970; Brar and Singh, 1980).

The objective of the present study is to describe the distribution of intestinal parasitosis

in a coastal area of West Bengal and to search for its possible relationship with one such factor, viz. the depth of the source of drinking water.

### MATERIAL AND METHODS

Digha is situated 180 k.m. south of Calcutta under Padima Block, Medinipur district, West Bengal. All the 36 villages in Digha Police Station were listed and given identification/Serial numbers, 01 to 36. From this list, a village was randomly chosen (using the table of random numbers). Whether the village thus chosen had a total population of  $\geq 300$  individuals, according to District Census Handbook, Medinipur, 1971, was then checked. If it had, then it was included in our list of study villages; otherwise it was ignored. This procedure was repeated until a list of six villages was obtained. Simple random sampling without replacement was followed. After selection, it was noted that the study villages were located one to three kilometers from the coast.

Next, in each study village all the households were listed and given serial numbers. Approximately 15% of the households

were selected by *linear systematic method*. Thus, every sixth or seventh household was selected (sixth in case of "small" and seventh in case of "large" villages, the cut-off point being 100 households per villages), with a random start from one of the first six or seven households.

Finally, for convenience of conducting the survey, a non-cooperating household in the sample was substituted by a neighbouring household; this had to be done only rarely. The name of heads of households and numbers of members in existing households, were obtained from the Block Office. Information on each household member about age, sex, monthly expenditure, education, toilet habit, house type, source of drinking water, hospital facility, food habit, habit of using footwear, etc. were

collected using a questionnaire-schedule. Intestinal parasitic data were collected by examination of faeces specimens. All the household members, or as many as available at the time of collection of data, were covered. Morning faeces specimens were examined, after administration of laxative the previous evening, from the study villages, for protozoa/cyst in saline/iodine preparation and for helminthic ova by saturated saline floatation technique. The techniques of collection of specimens have been described in details by Bhattacharya (1980) and are not repeated here.

The following were the study villages: (1) Alankarpur, (2) Dakshin Simulia, (3) Khadal Gobra (Digha), (4) Haropur, (5) Ghersai and (6) Moitrapur (Fig. 1).

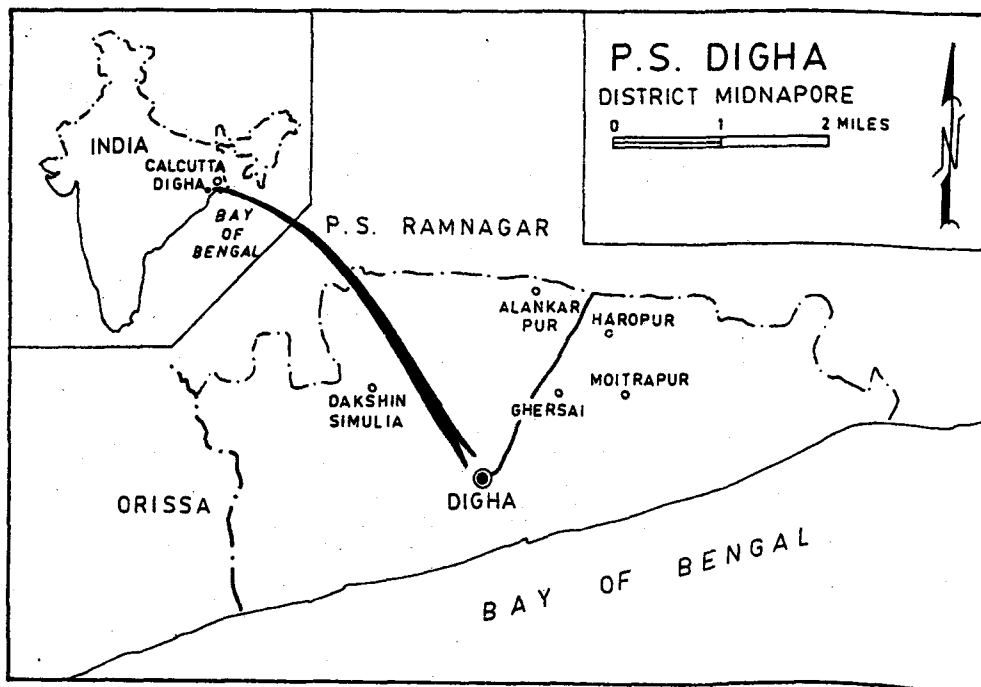


Fig. 1.

## RESULTS AND DISCUSSION

The data on the types of infestation in adults and children in different villages are presented

in table 1. The table shows that the frequency of individuals with Nothing Abnormal Detected (NAD) varies from village to village. The highest frequency of NAD is observed

Table 1: Infestation patterns in adults and children in the six experimental villages

| Name of experimental villages             | Status | No. examined | No. N.A.D. | NAD % | Single Protozoa | Mixed Protozoa | Single Helminth | Mixed Helminth | Mixed Protozoa & Helminth | Total Protozoa | Protozoa % | Total Helminth | Helminth % |
|---|--------|--------------|------------|-------|-----------------|----------------|-----------------|----------------|---------------------------|----------------|------------|----------------|------------|
| Alankarpur                                | Adult  | 34           | 7          | 20.6  | 2               | 2              | 8               | 8              | 7                         | 11             | 32.0       | 23             | 67.6       |
|   | Child  | 22           | 3          | 13.6  | 2               | —              | 11              | 1              | 5                         | 7              | 32.0       | 17             | 77.3       |
|   | Total  | 56           | 10         | 17.8  | 4               | 2              | 19              | 9              | 12                        | 18             | 32.0       | 40             | 71.4       |
| Dakshin-Simulia                           | Adult  | 59           | 12         | 20.3  | 2               | —              | 20              | 14             | 11                        | 13             | 22.0       | 45             | 76.3       |
|   | Child  | 19           | 3          | 15.8  | 1               | —              | 6               | 3              | 6                         | 7              | 37.0       | 15             | 78.9       |
|   | Total  | 78           | 15         | 19.2  | 3               | —              | 26              | 17             | 17                        | 20             | 25.6       | 60             | 76.9       |
| Digha                                     | Adult  | 85           | 14         | 16.5  | 7               | —              | 25              | 9              | 30                        | 37             | 43.5       | 64             | 75.3       |
|   | Child  | 58           | 14         | 24.1  | 2               | —              | 11              | 16             | 15                        | 17             | 29.0       | 42             | 72.4       |
|   | Total  | 143          | 28         | 19.5  | 9               | —              | 36              | 25             | 45                        | 54             | 37.8       | 106            | 74.1       |
| Haropur                                   | Adult  | 59           | 22         | 37.3  | 5               | 2              | 15              | 3              | 12                        | 19             | 32.0       | 20             | 50.8       |
|   | Child  | 17           | 3          | 17.6  | 1               | —              | 8               | 2              | 3                         | 5              | 29.0       | 13             | 76.5       |
|   | Total  | 76           | 25         | 32.9  | 6               | 2              | 23              | 5              | 15                        | 24             | 31.6       | 43             | 56.6       |
| Ghersai                                   | Adult  | 23           | 6          | 26.1  | 2               | 2              | 5               | 2              | 7                         | 11             | 48.0       | 14             | 60.0       |
|   | Child  | 8            | 1          | 12.5  | —               | —              | 2               | 2              | 2                         | 2              | 25.0       | 6              | 75.0       |
|   | Total  | 31           | 7          | 22.5  | 2               | 2              | 7               | 4              | 9                         | 13             | 42.0       | 20             | 64.5       |
| Moitrapur                                 | Adult  | 40           | 6          | 15.6  | 4               | 2              | 9               | 6              | 13                        | 19             | 47.5       | 28             | 70.0       |
|   | Child  | 14           | 1          | 7.1   | —               | —              | 6               | 1              | 6                         | 6              | 43.0       | 13             | 92.8       |
|   | Total  | 54           | 7          | 12.9  | 4               | 2              | 15              | 7              | 19                        | 25             | 46.0       | 41             | 75.9       |
| All Villages—<br>Combined Coastal<br>Zone | Adult  | 300          | 67         | 22.3  | 22              | 8              | 82              | 42             | 79                        | 110            | 36.6       | 204            | 68.0       |
|   | Child  | 138          | 25         | 18.1  | 6               | —              | 44              | 25             | 38                        | 44             | 31.9       | 106            | 76.8       |
|   | Total  | 438          | 92         | 21.0  | 28              | 8              | 126             | 67             | 117                       | 154            | 35.2       | 310            | 70.8       |

in Haropur (32.9%); it is also found that fewer adults are affected compared to children (NAD%-adult : child :: 37.3% : 17.6%). The village Moitrapur shows the NAD percentage as 12.9, where also children were found to be more frequently affected (adult : child :: 15.6% : 7.1%). In the other villages, the NAD frequency varies from 18% to 22%. Considering all the villages together the overall frequency of NAD in the study area comprising six villages is found to be 21% (adult : child :: 22.3% : 18.1%). Considering some major helminthic and protozoal infestations, occurring singly or in association with others, it is observed that protozoal infestations, in general, are less

from helminthic infestations, which corroborates Chandler's (1925, 1926, 1927) findings. The overall frequency of helminthic infestation is the highest in Dakshin Simulia (77%), closely followed by Moitrapur (76%), while in Haropur it is the lowest (58%). Both Dakshin Simulia and Moitrapur differ significantly (at 5% level) from Haropur in respect of helminthic infestation. Out of several helminthic infestations, both hookworm and roundworm appear to be predominant in all the villages (Table 2). In the village Digha, hookworm has the highest prevalence (68.5%), singly or associated with other helminths, while roundworm prevalence is the highest in

Table 2: Prevalence of individual helminthic infestations

| Name of village | No. examined | Total Helminths | Total HW & % | Total AI & % | Total * OV & % |
|-----------------|--------------|-----------------|--------------|--------------|----------------|
| Alankarpur      | 56           | 40              | 25<br>44.6%  | 33<br>58.9%  | 1<br>1.8%      |
| Dakshin-Simulia | 78           | 60              | 51<br>65.4%  | 43<br>55.1%  | 1<br>1.3%      |
| Digha           | 143          | 106             | 98<br>68.5%  | 80<br>55.9%  | —              |
| Haropur         | 76           | 43              | 25<br>32.9%  | 39<br>51.3%  | —              |
| Ghersai         | 31           | 20              | 15<br>48.4%  | 18<br>58.1%  | —              |
| Moitrapur       | 54           | 41              | 27<br>50%    | 42<br>77.8%  | —              |

\*Singly or associated with other helminths

prevalent than the helminthic ones in all the villages. While the protozoal infestation varies from 26% to 46%, the helminthic one varies from 58% to 79%. Thus it appears that in this coastal area, people do suffer considerably

Moitrapur (77.8%), singly or associated with other helminths.

Table 3 on the source of drinking water shows the average depth of tube-wells used for collecting drinking water, along with the

Table 3: Source of water, average depth of tube-well and hookworm infestation in the six experimental villages

| Name of experimental village | Source of drinking water | Average depth of tube-well (in feet) | H.W. % |
|------------------------------|--------------------------|--------------------------------------|--------|
| Alankarpur                   | Tube-well                | 365-400 (110-120m)                   | 44.6   |
| Dakshin-Simulia              | Tube-well                | 350-400 (107-120m)                   | 65.4   |
| Digha*                       | Tube-well                | 20-300 ( 6-90m)                      | 68.5   |
| Haropur                      | Tube-well                | 425-500 (130-150m)                   | 32.9   |
| Ghersai                      | Tube-well                | 400-425 (120-130m)                   | 48.4   |
| Moitrapur                    | Tube-well                | 200-465 (70-140m)                    | 50.0   |

\*Besides this, in Digha, filtered water (salty) is also available; but people prefer tube-well water for drinking

per cent hookworm-affected. It appears that tube-well water in Digha is available even at the depth of 20 feet (6 metres), while in Haropur, the average depth of tube-well water is 425-500 feet (130-150 metres). The differential hookworm infestation between the two villages may possibly be explained in terms of the differential chances of the hookworm ova seeping through the soil and contaminating the fresh water level.

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