

**Original Article****Role of Anthelmintic Drug and Health Education in Reducing Helminthic Infestation Rate Among the Rural Children**Md. Mostaque Hossain Ansari<sup>1</sup>**Abstract**

Intestinal Helminthiasis is one of the major causes of childhood malnutrition in Bangladeshi rural children. This case control study was undertaken to observe the comparative role of anti-helminthic drug and Health Education in reducing the incidence rate of helminthic infestation in rural primary school children. Three Primary schools were selected in different union of Dhamoirhat thana in Naogaon district. Saline preparation of stool of all students in three schools were done in first week of May, August and November 1997 blindly. Tablet Mebendazole was given only to the students with positive finding of stool for helminthic ova in first school (D R School). After each examinations, health education was conducted in the second school (H E School) one hour weekly since the beginning of the study irrespective of findings and no intervention was done in the third school (C O School) taken as control group. Quarter yearly (in three months) incidence rate in D R School were 8.1% and 8.3%, in H E School were 14.5% and 23.5% and in C O School were 9.1% and 18.3% (in population at risk) in the study. Analysis shows the significant role of anti helminthic drug in reducing the incidence rate besides the prevalence than health education (P value 0.0007). Recommendation was made to continue the mass deworming program as it reduces the reservoirs despite the environmental factors sufficiently enough for transmission of the disease in Bangladesh perspective.

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**Introduction**

Among the helminthes associated with gastro intestinal tract at some stage in parasitic life cycle, at least 20 species must be regarded as important of high prevalence and of potential pathogenicity. A large section of the population, especially of developing countries harbor intestinal parasite in different prevalence rates.<sup>1, 2, 3</sup> For maintenance of high prevalence and continued transmission of the infestation, all the factors are enormously present in Bangladesh. Along with these, the children are mostly prone to intestinal

worms due to poverty, low educational level of parents, differences in home technology, high demographic density and ruralism.<sup>4</sup> World Health Organization (WHO) Expert Committee on Control of Ascariasis had remarked four elements viz. Basic Parasite Biological Research, Epidemiological research and surveys, Specific approaches to control and Organizational consideration on this aspect.<sup>5</sup> The currently recognized control approaches are Mass chemotherapy, Environmental measures and Health Education for behavioral change.<sup>6</sup> Beside

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these, the safe disposal of human excreta, provision of adequate and safe water supply in such was as to promote a high standard of personal hygiene in the population and the prevention of food contamination by faecal materials had been also added by WHO committee.<sup>5</sup> As a control measure, mass-deworming program has been introduced in Bangladesh along with much emphasis on behavioral change and improvement of personal hygiene. Sanitation improvement is the major portion of the key approaches but expensive. In this study, we would observe the competitive role of mass chemotherapy and health education in preventing the incidence of the helminthic infestation considering the other factors constant especially among the rural children in Bangladesh.

### Methodology

Three union (Omarpur, Dhamoirhat and Jahanpur) of Dhamoirhat thana, one school in each union and the school for intervention with drug (Omarpur Non Govt. Primary School-D R), with Health Education (Mohisor Govt. Primary School-H E) and Control (Jahanpur Govt. Primary School-C O) were selected by lottery method for study. All the students in those schools reading in class II and above were included in the study. There were 130, 125 and 120 children from those schools in the study respectively.

Microscopic stool examination of all students were done with saline preparation in the first week of May, August and November 1997 blindly within six hours of collection.

Tablet Mebendazole was given in usual dose to the students of D R School whose stool were positive for helminthic ova and Tablet B Complex (Placebo) to the other students. Two graduate men were trained to conduct health education class for all students in the H E School one hour weekly since the beginning of the study. Nothing was done in the C O school except three times stool examination.

Point prevalence of helminthiasis in the three schools at the beginning and on the date of second and third stool examination were found out and incidence rate in three months interval (Quarter yearly) during the second and third stool examinations were calculated. Students with negative stool finding in the previous examination time were included in population at risk in the next examination period. SPSS and EPINFO software used for analysis.

### Results

Mean age of the studied students in D R School, H E School and C O School were  $8.76 \pm 1.08$ ,  $8.69 \pm 1.49$  and  $8.69 \pm 0.83$  years respectively and there were no so significant difference in guardian's occupation and educational level in all of them.

The point prevalence rate in D R School, H E School And C O School on the first week of May were 43.1%, 39.2% and 45.0%, on first week of August were 7.70%, 45.6% and 50.0% and on the first week of November were 8.5%, 58.4% and 59.2% respectively.

The Incidence rate estimated during second and third examinations in D R School, H E School and C O School were 8.1% & 8.3%, 14.5% & 23.5% and 9.1% & 18.3% respectively.

### Discussion

The incidence rate of helminthic infestation among the children in the school where intervention was done by antihelminthic drug (only among the students of ova positive in stool) was significantly lower than the school where Health Education was conducted among the all children and the control school. And quarter yearly anti helminthic drug application has also been able to maintain lower level of (Point) prevalence rate in that school than the others. Periodic deworming had probably reduced the reservoirs of infestation and there by reduced the risk of infestation among the population at risk. There were no significant differences for the impact of age and sex of the students, Occupations of the guardians, presence of latrine at home or number of children in the

family for causation of helminthic infestations among the three groups except for educational level of the guardians which was just significant in drug school and control school during the third stool examination. The prevalence rates in our finding were closer to a lot of studies.<sup>1, 2, 3, 4, 6</sup> There are few studies regarding the incidence rate and our study has similar finding like that of Haq and Sheik,<sup>9</sup> Incidence and its gradual increase depends on presence of the agent, susceptibility of the host to the agent and all of the above environmental factors play most important role for transmission and existence of the infection in the community.

Health education for health fully living did not have any impact to bring behavioral changes among the children, which has been assumed and assessed indirectly in this study by the incidence rate that differs from Khanum and Salahuddin<sup>7</sup>. Children may have accepted the knowledge<sup>8</sup> but materials and facilities for healthfull livings are related to their parent's financial and educational capabilities.

For the control of the helminthic infestation mass chemotherapy, environmental measures and health education for behavioral change has been suggested by WHO Expert committee<sup>5</sup>. At the present perspective of Bangladesh social and economical condition, improvement of sanitation and its sustained maintenance is absolutely impossible. We have tried to compare the existing measures of mass chemotherapy and health education with the control group in this study to observe the effectiveness of the measures in reducing prevalence and incidence of the worm load. In the present situation periodic antihelminthic drug had been proved more effective in the urgent situation comparative to health education which is a prolonged, time consuming and costly.

Our sample size was extremely small. We strongly recommend mass periodic deworming to maintain good nutritional status of the children and also we propose to carry similar studies with large sample size elsewhere in the country to get support and recommendation for the appropriate measure of the problem.

**Table-I:** Some demographic and environmental factors of the study children.

	DR School	H E School	C O School
<b>Age (years)</b>			
Mean	8.76 Years	8.69 Years	8.69 Years
Median	8.00	9.00	8.00
Mode	8	7	8
S D	1.08	1.49	0.83
<b>Sex</b>			
Male	68 (52.3%)	56 (44.8%)	52 (43.3%)
Female	62 (47.7%)	69 (55.2%)	68 (56.7%)
<b>Guardian's occupation</b>			
Bargha chasi	58 (44.6%)	35 (28.0%)	44 (36.7%)
Own land cultivator	51 (39.2%)	25 (20.0%)	35 (29.2%)
Others	21 (16.2%)	65 (52.0%)	41 (34.2%)
<b>Guardian's Education</b>			
Primary School	39 (30.0%)	47 (37.6%)	28 (23.3%)
Illiterate	76 (58.5%)	68 (54.0%)	79 (65.8%)
High School & above	15 (11.5%)	10 (8.0%)	13 (10.8%)
<b>Number of Children in the Family</b>			
One	12 (9.2%)	8 (6.4%)	6 (5.0%)
Two	32 (24.6%)	26 (20.8%)	31 (25.8%)
Three	45 (34.6%)	48 (38.4%)	40 (33.3%)
Four	20 (15.4%)	22 (17.6%)	17 (14.2%)
Five and more	21 (16.2%)	21 (18.8%)	26 (21.7%)
<b>Latrine at Home</b>			
Yes	59 (45.4%)	109 (87.2%)	89 (74.2%)
No	71 (54.6%)	16 (12.8%)	31 (25.8%)

**Table-II:** Report of Microscopic Stool Examinations.

School	Report of Stool Examination						
		Total study Population	Number of positive cases	No of negative cases	Total negative cases in that school during exam.	Prevalence Rate	Incidence Rate (quarter yearly)
D R	First Exam	130	56	74		43.1%	
	Second Exam	74	6	68	120*	7.7%	8.1%
	Third Exam	120	10	110	110	8.5%	8.3%
H E	First Exam	125	49	76		39.2%	
	Second Exam	76	11	65	68*	45.6%	14.5%
	Third Exam	68	16	52	52	58.4%	23.5%
C O	First Exam	120	54	66		45.0%	
	Second Exam	66	5	60	60*	50.0%	9.1%
	Third Exam	60	11	49	49	59.2%	18.3%

Note \* Negative cases in that examination was taken as study population in the next examination.

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