



## Study on Prevalence of Intestinal Parasitic Infections Among Pre & Para School Children of Khurda District, Odisha

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### Abstracts

*Intestinal parasitic infection constitute the greatest single world-wide cause of illness and disease. Intestinal parasitosis is one of the major problems of public health in developing countries. The study was carried out to determine the prevalence and the type of pathogenic intestinal parasites infesting the pre school and school going children which will help in identifying the high risk group and in formulating appropriate control strategies. These finding suggest that the prevalence of intestinal parasitic infection was found to be highest in poor Socio-economic class followed by low socio-economic class and General Socio-economic class. Regular deworming program in association to other preventive measures may help reduce the prevalence.*

**Keywords:** *Intestinal Parasitic Infections, School Children, protozoa & Helminthes.*

### Introduction

Intestinal parasitic (IP) infection is a world-wide public health concern.<sup>1</sup> Intestinal parasitic infections are among the major problems of public health in developing countries. Approximately, 3.5 billion individuals have been infected with intestinal parasites, of these 450 million individuals developed diseases.<sup>2,3</sup> Parasites are one of the important casual agents of diarrhoea, loss of weight, abdominal pain, nausea, vomiting, lack of appetite, abdominal distension and Iron deficiency anemia.<sup>4</sup> Intestinal parasitosis alone is one of the most common public health problems in all over India.<sup>5,6,7</sup> The distribution and

prevalence of the various intestinal parasites species depend on social, geographical, economical and inhabitant customs. Studies on human parasitic infections have demonstrated a common relationship between parasitic infections and lower socio-economic status of the region.<sup>8</sup> So periodic epidemiological studies and transmission dynamics in parasitic infections will provide more accurate understanding.<sup>9</sup> Poverty, illiteracy, poor hygiene, lack of access to potable water, hot and humid tropical climate are the factors associated with intestinal parasitic infections.

The environment and the socio-cultural habits of the people could be attributable for the high

prevalence of intestinal parasitic infections in the developing countries (Mbanugo *et al.*, 2002)<sup>10</sup>. In addition poverty, malnutrition, high population density, the unavailability of potable water, low health status and a lack of personal hygiene provide optimal conditions for the growth and transmission of intestinal parasites (Sayyari *et al.*, 2005)<sup>11</sup>. Children are the most affected due to the heavy infections they harbour and because of their vulnerability to nutritional deficiencies (Luka *et al.*, 2000)<sup>12</sup>. As a result of morbidity they are at increased risk for detrimental effects like poor growth, reduced physical activity, impaired cognitive function and learning ability (Nokes *et al.*, 1992)<sup>13</sup>. The most important drawback of IPI's is about 90% of infected individuals remain asymptomatic (Reed *et al.*, 2001)<sup>14</sup>. Other barriers to decreasing the rates of parasitic infections include insufficient parasitic disease research, neglect of the problem in developing countries and a lack of follow-up treatments (Sayyari *et al.*, 2005)<sup>11</sup>. Therefore this study aimed at identifying the prevalence and the type of pathogenic intestinal parasites infesting the pre school and the school going children which will help in identifying the high risk group and in formulating appropriate control strategies.

### Material and Methods

This was a hospital based cross sectional study conducted in the Department of Microbiology, Hi-Tech medical College & Hospital, Bhubaneswar during the period from July 2011 to February 2012. A total 250 subjects were enrolled in this study out of these 85 were female and 165 were male. The samples were collected from pre school and ongoing school children of different wards and blocks of Khurda districts in random basis. They were provided with clean, dry, screw capped and properly labelled universal sample container for the collection of the stool sample. Faecal samples were examined for the presence of parasites both macroscopically and microscopically. The samples were examined by standard parasitological examination which

included wet mount (Saline mount, Iodine preparation and bile stained method) and by formal-ether concentration method.<sup>15</sup> They were observed under low and high power fields of microscope. Macroscopic examination of stool was done for presence of mucus, blood or any parasites. Microscopically for presence of eggs, cysts, and trophozoites of intestinal parasites. The findings were stratified against age, sex and ethnic and were analyzed by applying statistical tools. Data were analyzed by using Microsoft excel sheet and SPSS 11.5 version.

### Results and Discussion

In the present study, a total of 250 stools samples were collected in a clean, dry screw capped universal container. The specimens were examined microscopically for presence of eggs, cysts, and trophozoites of intestinal parasites by Saline mount, Iodine preparation, bile stained method and by formal-ether concentration method. Out of total 250 pre school and school going children included in the study, 165 were male and 85 were female. 70(28%) were positive for one or more parasites (Table 1). Significantly highest infection rate was observed in the children aged between 5-10 years 41(58%), followed by 0-4 years 10(21%) and 11-15 years 19(14%) (Table 2). Table 3 represents the prevalence of parasitic infection was significantly higher in male children 49(19.6%) than female children 21(8.4%) ( $P<.001$ ). Ethnically, prevalence of intestinal parasitic infection was found to be highest in poor Socio-economic class 16(40%) followed by low socio-economic class 25(29.4%) and General Socio-economic class 29(23.2%) (Table 4). Altogether 5 species (2 protozoan and 3 helminthes) of intestinal parasites were detected. Out of total parasites detected, 35(50.0%) protozoan, 20(28.6%) were helminthes and 15(21.4%) were mixed type. *Giardia intestinalis* 30(42.8%) and Hook worm 12(17.1%) were the commonest protozoan and helminthes respectively. The other parasites detected were

*A. lumbricoides* 6(8.6%), *H. nana* 2(2.8%) and *Entamoeba histolytica* 5(7.1%) (Table 5). Mixed (both Protozoa and Helminths) was detected in 15(21.4%) children.

**Table 1:** prevalence of intestinal parasitic infection in students:

Number of students (250)	Results	Percentage (%)
70	+ve	28
180	-ve	72
<b>Total =250</b>		<b>100</b>

**Table 2:** prevalence based on age group:

Age group	Total (n)	Positive (n)	Percentage (%)
0-04 yrs	46	10	21
05-10	70	41	58
11-15 yrs	134	19	14

**Table 3:** prevalence of intestinal parasitic infection in male and female:

Gender	Total (n)	Positive (n)	Percentage (%)	p-value
Male children	165	49	19.6	0.001
Female children	85	21	8.4	
<b>Total</b>	<b>250</b>	<b>70</b>	<b>28</b>	

**Table 4:** prevalence of intestinal parasitic infection based on Ethnic group:

Socio-economic Class	Total (n)	Positive (n)	Percentage (%)	P-value
General	125	29	23.2	0.001
Low	85	25	29.4	
Poor	40	16	40	
<b>Total</b>	<b>250</b>	<b>70</b>		

**Table 5:** Frequency of intestinal parasite detected:

Types of parasite	Total positive (n)	Percentage (%)
<b>Protozoa</b>	<b>35</b>	<b>50.0</b>
G. lamblia	30	42.8
E. histolytica	5	7.1
<b>Helminthes</b>	<b>20</b>	<b>28.6</b>
Hook worm	12	17.1
Lumbricoides	6	8.6
H. nana	2	2.8
<b>Mixed (both protozoa and Helminths)</b>	<b>15</b>	<b>21.4</b>
<b>Total parasites</b>	<b>70</b>	<b>28</b>

There was no significant difference in prevalence of intestinal parasites according to age and gender of the school children (data not shown). Especially the prevalence of intestinal protozoa found in this

study was higher than previous studies conducted in this area (Bansal, et al.<sup>16</sup>, 2004, Khurana, et al., 2005)<sup>17</sup>. This is in contrast with the few reports conducted in other parts of India (Awasthi and

Pande, 1997, Fernandez, et al., 2002, Wani, et al., 2007)<sup>18,19,20</sup> where a higher prevalence of helminthic infections than protozoan infections was reported. In India, the highest prevalence of intestinal parasitic infections (91%) in school going children was reported in rural settings in and around Chennai, South India (Fernandez, et al., 2002)<sup>19</sup>. Protozoan parasitic infections were significantly higher (81.2%) than the intestinal helminthic infections (18.8%), which is in contrast to reports in other parts of the world (Steketee, 2003, Rodriguez-Morales, et al., 2006)<sup>21,22</sup>. However, these studies focused on different populations and the present study is pre school and on going school children. This could be the reason for the difference in prevalence of parasites.

### Conclusion

Intestinal parasitic infections are a leading cause of human morbidity and mortality. The present study reveals that the incidence of intestinal Parasitosis is as high as 28%. This suggests the intestinal parasitic infection poses a public health challenge in children found in Odisha (Khurda district) and the prevalence of Parasitic infection was significantly higher among Male children than Female children. Highest infection rate was observed in the Children aged between 5-10 years. Ethnically, prevalence of intestinal parasitic infection was found to be highest in Poor Socio-Economic class followed by Low Socio-Economic class and General Socio-Economic class. Regular deworming program in association to other preventive measures including good education to the School going children on personal hygiene, environmental sanitation, clean water supply and treatment should be taken into account to reduce the prevalence of intestinal parasites.

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