

## Prevalence of intestinal parasitic infection in school children in Bijapur, Karnataka

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### Abstract

Intestinal parasitic infections continue to be a major health problem in children in developing countries. The present study attempted to assess the prevalence of intestinal parasitic infections in primary school children aged 8-13 years in a primary school. It was a cross-sectional study including 58 primary school children, out of which 35 were boys and 23 were females. Out of the 58 subjects examined 6 (11%) had intestinal parasite infection. The prevalence of infection was maximum in the age group of 10-11 years, followed by almost equal prevalence in age group of 8-9 years and 12-13 years. Among the parasites, the prevalence of ascaris lumbricoides was highest (83%), followed by hymenolepis nana (16%). The prevalence of parasitic infestation was seen higher in those who consumed untreated water, and, in those who had open sanitary habits. Health education regarding hygienic practices in the school at primary levels can have significant effect in prevention of intestinal parasites infection among the children.

**Keywords:** Parasitic infection, Open sanitation, Treated water, Ascaris.

### Introduction

Intestinal parasitic infection is endemic worldwide, and it represents serious medical health problem in the developing countries. It is estimated that 3.5 billion people are affected, and 450 million are ill as a result of these infections, the majority being children.<sup>1</sup> These infections cause morbidity and mortality along with other manifestations like iron deficiency anemia, growth retardation in children and other physical and health problems. Factors like 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.<sup>2</sup> Children, because of their vulnerability to nutritional deficiencies are the most affected due to the heavy infections they harbour. There is paucity of studies in parasitic infestation in children due to asymptomatic nature of majority of infections and due to lack of follow-up treatments. Hence this study aimed at measuring the prevalence and the type of parasites infesting the primary school children which will help in identifying the high risk group and in formulating appropriate control strategies.

### Materials and Methods

The present observational and cross sectional study was carried out the Department of Community Medicine, Al Ameen Medical College, Bijapur, Karnataka from August 2005 to October 2005. Students of both sexes of Grade III to Grade VI (8 to 13 years old) of Shri Bhavani Higher Primary Kannada Medium School Bijapur were included in the study. Study was commenced after the approval from Institutional Ethical Committee and written permission was taken from each schools head. Stratified random sampling method was applied to choose the study subjects. Students who were

ready to give verbal consent were included in the study. Stool samples were collected in wide mouthed sterile screw capped labelled containers without preservative. At the time of collection date of samples, information regarding toilet facility, behavioural habits like hand washing practice after defecation, source of drinking water, any symptoms was documented in performa. A macroscopic examination of the stool was first performed to find evidence of blood, mucus, parasitic segments or whole parasites. Saline and iodine wet mounts were prepared by adding a drop of saline and lugol's iodine to clean glass slides and then mixed with a small amount of stool. A coverslip was placed and the slide was visualized microscopically first at low power to detect trophozoites and eggs and then at higher power for morphological details. Numerical information got from the example was sorted out and abridged from the example with the assistance of expressive measurements, like percentage and frequency. Microsoft excel was used for the interpretation of these outcome and graphical representation. Findings were compared with national and international studies.

### Results

Stool samples from a total 58 students were studied during study period (35 males and 23 females). 6 students (10 %) were found to have parasitic infection, while 52 cases (90 %) were not infected. Maximum cases were from age group 10-11 years, followed by almost equal prevalence in age group of 8-9 years and 12-13 years. Both non infected (44%) and infected (50%) cases were maximum in age group of 10-11 years. (Table 1) 66 % of cases were males and 34 % of cases were females. 82 % of cases used untreated water for consumption. Muslims (66%) were more commonly

affected in both infected and non-infected groups. Parasitic infection was common in those having open sanitary habits (66 %) (Table 2) Most common infection encountered was of *Ascaris lumbricoides* (83 %) followed by *H.Nana* (16 %). (Table 3)

**Table 1: Distribution of students according to age and intestinal parasitic infestation**

Age in years	Not infected	Infected	Total
8 - 9	14 (26.9%)	1 (16.7%)	15
10 – 11	23 (44.2%)	3 (50.0%)	26
12 - 13	15 (28.8%)	2 (33.3%)	17
Total	52	6	58

**Table 2: Distribution based on gender, religion, sanitation and water treatment**

	Positive (%)	Negative (%)	Total
<b>Sex</b>			
Male	4 (66.7)	31(59.65)	35
Female	2 (33.3)	21 (40.4)	23
Total	6	52	58
<b>Religion</b>			
Hindu	2 (33.35)	20 (38.5)	22
Muslim	4 (66.7)	32 (61.5)	36
Total	6	52	58
<b>Sanitation</b>			
Closed	2 (33.3)	37 ( 71.2)	39
Open	4 (66.7)	15 (28.8)	19
Total	6	52	58
<b>Water treatment</b>			
Treated	1(16.7)	9(17.3)	10
Untreated	5 (82.3)	43 (82.7)	48
Total	6	52	58

**Table 3: Distribution of students according to type of intestinal parasitic infestation**

Parasite	A. Lumbricoide	H. Nana	Total
Cases	5	1	6
Percentage	83.3	16.7	100

## Discussion

All around, the ignored intestinal parasitic contaminations (IPIs) have been perceived as a standout amongst the most noteworthy reasons for diseases, with a normal predominance rate of 50 % in developed world, and just about 95% in developing countries.<sup>3</sup> These infections are ubiquitous with high prevalence among the poor and financially denied groups where overcrowding, poor natural sanitation, low level of formal training and absence of access to safe water are prevalent.<sup>4</sup>

Age is an important risk factor for intestinal parasitic infection, and school going children have been

reported to be have highest prevalence.<sup>5</sup> In present study school going children of age group 10 to 11 years was selected as previous studies showed higher prevalence in this age group.<sup>2,6</sup> Children in these age groups often spend more of their time outdoors and are more often in contact with soil and eat with unwashed hands. In this study, male children were more affected than female children which is in correlation with observation of other studies.<sup>2,7</sup> However study by Sah et al,<sup>8</sup> showed equal infection rate between male and female children.

Prevalence of intestinal parasitic infection in present study was only 10 %, which when compared to other studies<sup>9,10,4</sup> was less. The Bijapur being comparatively developed town, the periodic administration of anti-helminthic drug to the children and health education about cleanliness and sanitation given by different NGO in school kids could possibly clarify the lower prevalence of protozoan infections seen in this study. Similar prevalence rate was observed in studies conducted in developed township.<sup>8</sup>

Faeco-oral route of transmission is major cause of intestinal parasitic infection. 82.3 % of infected children did not treat water before drinking. Findings of different investigations<sup>8,11,1,12</sup> additionally appeared the higher rate of contamination was among kids who expended untreated water than those drink treated water. Low quality of water might be because of tainting of water by human waste or because of lacking chlorine. Children who have no proper sanitation or used open sanitation have shown more prevalence of infection. This finding is in accordance with finding of study done in Uttarakhand.<sup>1</sup> Poor sanitation and poor drinking water are part of spectrum of improper sewage disposal leading to contamination of water. Studies have shown that crowding and technical problems in disposal of sewage as the main factors determining parasitosis in water.<sup>13</sup>

The most prevalent intestinal parasite in this study was *Ascaris lumbricoides* followed by *H. Nana*. This finding is consistent with findings of previous studies.<sup>2,6,14-16</sup> While, *Giardia lamblia* was most common parasite encountered in another study.<sup>1</sup>

This examination demonstrated that intestinal parasitic contamination is a noteworthy general medical issue and is straightforwardly identified with poor individual cleanliness and different elements. It has been demonstrated that transmission of intestinal parasitic diseases among groups in developing nations isn't principally by means of water, however rather through different courses, for example, contaminated food and unclean hands. Among the interventional measures wellbeing training of school going kids, health education of appropriate hand cleanliness, adequate waste disposal and arrangement of safe drinking water are most important.<sup>1</sup> The knowledge of prevalence will help in formulating better treatment strategies particularly in paediatric population.

Limitation of the study is smaller sample size, larger sample size needs to be examined to validate the findings of the present study. In this study single stool examination was done for detection of intestinal protozoan infections, which could have underestimated the prevalence, as exact lab conclusion of intestinal parasitic contaminations requires the examination of no less than three stool examples gathered more than a few days.<sup>17</sup> The investigation additionally has not considered other socio-statistic parameters related with intestinal parasitic pervasion in order to acquire a precise comprehension of the burden and reason for parasitic infection around there.

### Conclusion

The prevalence of intestinal protozoan infection was high among school children Bijapur. The prevalence of parasitic infestation was seen high among males, in those who consumed untreated water, and, in those who had open sanitary habits. Health education regarding hygienic practices in the school at primary levels can have significant effect in prevention of intestinal parasites infection among the children.

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