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PREVALENCE OF SOIL-TRANSMITTED HELMINTHIC INFECTION AMONG SCHOOL CHILDREN'S OF RYAN INTERNATIONAL SCHOOL, AURANGABAD DISTRICT (M.S), INDIA

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ABSTRACT
Soil-transmitted helminth (STH) infections represent a major public health problem in poor and developing countries. Stool samples were examined for helminth eggs by quantitative (Kato-Katz) technique to determine the prevalence and intensity of intestinal parasitic infection. 98 schoolchildren aged 9–10 years were enrolled. The prevalence of STH infections was 42 (42.85%). Detected parasite was *A. lumbricoides* 42 (42.85%). Socio economic status played a significant role in this study. Children from Ryan International School with higher environmental sanitation carried no parasites. A total of 14 (38.88%) females were infected while 28 (45.16%) of the males were infected. A higher percentage rate occurred among males than females though no association was made between the sexes. 56 (57.14) were found not infected.

KEY WORDS: Aurangabad prevalence, School-children, Soil-transmitted helminthiasis.

INTRODUCTION

The World Health Organization (WHO) estimates that more than one billion of the world's population is chronically affected by STH infections, which are closely correlated with poverty, poor environmental hygiene and impoverished health services. Intestinal helminthiasis are among the most common communicable disease of school-age children in certain communities and tend to occur at highest intensity in this age group (Olsen 1998). In particular, there is evidence to support the relationship between helminth infections, malnutrition and child development, with negative consequences for cognitive function and learning ability. The objectives of this study were to identify the prevalence of soil-transmitted helminth infections in the population of Ryan International School children's and to evaluate its relation to age and gender.

MATERIALS AND METHODS

Study area and population

Ninety eight school children, age 9-10 years in Ryan International School, Aurangabad district, Maharashtra state was randomly selected and investigated for their intestinal helminthic infections between December 2004 and December 2006.

Sampling method

The pupils were educated on the causes of intestinal helminthic infections among school aged children and they were convinced that every child ought to be free from such infections, thus the necessity of participating in the research work was appreciated by them. Thereafter, wide mouth corked sterile bottles were given to the pupils for the collection of their stool samples at home and structured questionnaires were distributed among the participating pupils for the collection of demographic information such name (optional), age, sex, type of toilet and water facility used, number of individuals in the house, parents occupation, religion, foot were habits, pet/domestic animals reared, regularity of deworming etc. and accordingly labelled (ID). Defecating site (open or modern sanitary latrine) were recorded for socio-economic conditions. The children's age were obtained from school record. The pupils were taught how to collect stool samples with the aid of their teachers, the questionnaires were correctly filled. The height and weight of the pupils were taken in the morning of the following day as they submitted their stool samples between 7.30 and 8.30 am. The stool samples were properly labeled and were carried in a cold box filled with Ice packs and transported to the private laboratory for analysis. The samples that could not be analysed immediately were preserved using 10% formalin until they were examined (Cheesbrough, 1998).

Analysis of samples

Stool analysis was performed using the Kato-Katz technique. (World Health Organisation, 2003). All the slides were read by one medical doctor specialized in parasitology and consistency of the reading was assured by second readings

performed in 20% of the slides randomly selected. Intensity of infections for each worm was defined according to the thresholds proposed by WHO Experts Committee in 1987. The following data were collected for each child: weight, height, infection for *A. lumbricoides*, *T. trichiura* and hook-worm.

Statistics

Most of the collected data were analyzed descriptively and some were statistically analyzed using $\chi 2$ test, to assess the significance levels of any differences found.

RESULTS

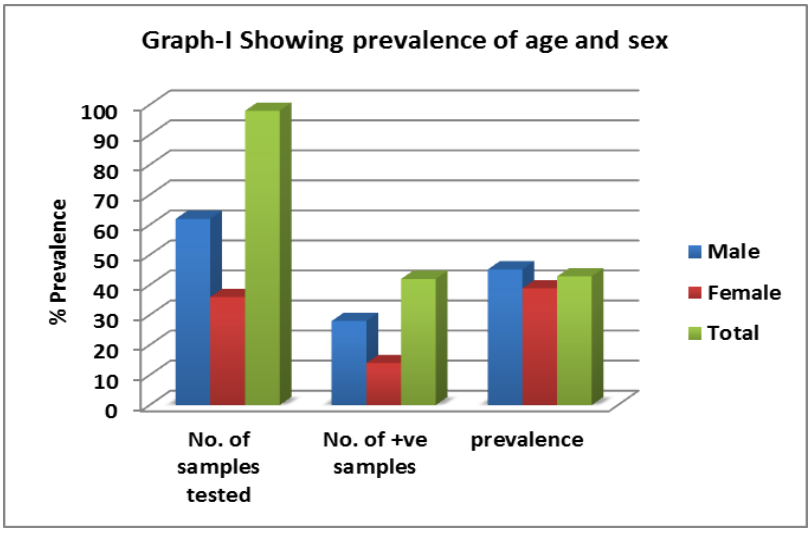
A total of 98 schoolchildren were invited to participate and 86 (67.4%) provided proper stool samples and complete information. Among these, 28 (45.16%) were males and 14 (38.88%) females were infected. The mean age of the children was 9-10 years. An overall prevalence of 42.85% (42 out of 98 children). The predominant parasite involved was *Ascaris lumbricoides* which was observed in 42 (42.85%) of the students **(Table 2).** Among these 56 (57.14%) was found not infected.

Table 1: Intestinal Helminthic infection in School Children according to age & sex.

Age (Years)	No. of samples tested			No. of infected cases					
	M	F	T	Male	%	Female	%	Total	%
9-10	62	36	98	28	45.16	14	38.88	42	42.85

Table 2: Prevalence *of A. lumbricoides* in infected school children

Age (Years)	Helminths	Total	%
9-10	*Ascaris- lumbricoides*	42	42.85



DISCUSSION

Soil-transmitted helminths remain prevalent throughout the developing world where levels of personal and environmental sanitation and maternal education are low Pearson (2002). In our study, 42.85% of the children were

infected with one of these helminths. Similar results have been given by Lindo *et al.* (2002). Majority of the incidences reported in various parts of the developing world fall between 17% and 76%. Andrade *et al.*, (2001), and Wariso (1994). However both extremely high Carme B, et al (2002) and low incidences Fernando SD et al (2002), have also been reported. *A. lumbricoides* prevalence superceded all parasites by showing a positivity of 42.85%. However, incidences lower than 30% have been reported in The zonal-level prevalence of Ascaris lumbricoides 9.9%, hookworm 9.7%, and Trichuris trichiura was 2.6 respectively (King, 2013).

Higher parasitic infections were observed among males compared to females in this study although the difference was not statistically significant. This pattern of parasitism with respect to gender of the students could best be attributed to higher hygiene level normally observed among the females of this age bracket compared to their male's counterpart. The males in this age group are involved in recreation and sporting activities that exposes their skin to contact with soil thereby exposing them to Ascaris infection. Males are generally more active and playful and are less careful and less discriminatory about what they eat which may make the spread of the infection easier and faster among the male students. This could also explain why the prevalence of infections was higher in males (45.16%) than in females (38.88%) showed in Table-1.

Investigators from elsewhere have reported higher prevalences either in females (Rajeswari *et al*, 1994) or males. The differences in findings among the studies can be explained by variations in geography, socio-economic conditions, and cultural practices of the population under consideration. The category of the study population, the methods employed for stool examination, and the time of study may also have contributed to the differences.

However, our study showed a 42.85% prevalence rate, a higher helminthic infection rate than a study in suburban Nakhon Prathom Province, which found a 0.5% infection rate (Ngrenngarmlert *et al.*, 2007). In the border area of Nan, Kanchanaburi and Srakaew the study showed a similar prevalence of 55.8%, 49.4% and 49.5%, respectively (Maipanich *et al*., 2004). Eighty seven percent of people wear shoes when they go out or go to work. Our study tried to use various techniques for determining parasitic infection.

The prevalence of *A. lumbricoides* was similar to the study conducted in rural inhabitants of north Cheju (Byong Seol, (1972) but not comparable with the studies conducted by Wani (2008) in Kashmir valley, India where the prevalence of *Ascaris lumbricoides* was highest (68.30%), followed by *Trichuris- trichiura* (27.92%).

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CONCLUSION

Infections could be minimized simply by giving them proper health education in classroom which will make them aware of mode of transmission of infection to which they are prone and also help in protecting themselves from parasitic infection by taking precautionary measures.

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