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Burden of common intestinal helminthic infection among children of tea community- A hospital based study

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ABSTRACT

Intestinal helminthic infection is one of the most common infection among the children of tea community due to unhygienic living condition , poor economic status, malnutrition and illiteracy. With this background, a cross sectional observational study has been undertaken to assess the prevalence of different intestinal helmithic infection among the children of tea community by examining stool samples microscopically. The subjects selected for the study was children of tea community attending pediatric department. A total 100 cases of both sexes belonging to different age groups were studied. Intestinal helminthic infection was quite common (70%) in the study population. Higher rate of infection was seen in age group ≤1-6 years (76.4%). The most commonest helmithic ova was Ascaris lumbricoides (64.8%) followed by Trichuris trichiura and Anchylostoma duodenale(11.4%). By analyzing the result it can be concluded that the intestinal helmithic infection remain a serious problem among the children of tea community and need appropriate prevention and control measures .

KEYWORDS : helminthic infection,tea garden community,Ascaris lumbricoides

Introduction:

Intestinal parasitic infection is one of the most common public health problems in the developing countries. The proportion of parasite populations in developing countries has remained virtually unchanged over the past 50 years. Although the resources for control of such infections are available but are still very limited. [1]Most of the infections are endemic and widely distributed throughout poor and socio-economically deprived communities in the tropics and subtropics. Tea garden community is one such vulnerable population. Environmental, socio-economic, demographic and health related behavior is known to influence the transmission and distribution of parasitic infection. They are transmitted by eggs present in human feces which in turn contaminate soil in areas where sanitation is poor. The main species that infect people are the roundworm (Ascaris lumbricoides), the whipworm (Trichuris trichiura) and hookworm (Necator americanus and Ancylostoma duodenale).

More than 1.5 billion people or 24% of the world's population are infected with parasitic infection worldwide with greatest number occurring in sub-Saharan Africa, the America, China and East Asia. [2]

Tea garden population constitutes approximately 1/5th of Assam's population. Poor economic conditions, ignorance due to illiteracy, overcrowded and unhygienic living conditions in the residential colonies make tea garden population vulnerable to various communicable diseases and malnutrition. [3] Parasitic infection occurs in children who play in contaminated soil, then put their hands in their mouth without washing them, by ingestion of contaminated water and food as well as by walking barefoot on the contaminated soil. Tea garden population represent 17% of Assam's population[4]. A number of studies have suggested that even a moderate intensity of helmithic infection may result in delayed physical growth and impaired cognitive development, particularly among school going children [5,6] . However evidence now exists that Ascaris infection modifies the immunological environment within an individual host to be protective against certain conditions, but permissive to others, with implication not only for the health of children but also of adults. [7]

Thus, with this we aim to study the burden of intestinal helminthic infection among children of tea community.

Aims and Objective:

- Identification of helminthic ova present in the stool of children belong to the tea garden community
- To find the prevalence of different helminthic infections at different age group.

Materials and Methods:

A cross sectional observational study was conducted among pediatric age group of tea garden community attending pediatrics department of Jorhat Medical College and Hospital from 1st of July to 1st of September 2016. Approval of the Institutional Ethical Committee of Jorhat Medical College and Hospital was taken initially to carry the study. Random sampling was done to collect the desired 100 stool samples. Information regarding age, sex and residence were obtained using a pre-designed and pre-tested proforma. Consent was taken from all the participants and their guardian before collection of data. Confidentiality was strictly maintained.

- **Sample collection:** Children and guardian were given brief information on the disease (cause, manifestations, consequences and diagnosis) prior to stool collection. A stool sample was collected from each enrolled participants in well labeled screw capped plastic container. Specimens were transported to laboratory of Microbiology Department, Jorhat Medical College and Hospital as early as possible.
- **Macroscopic examination:** Stool samples were observed macroscopically for colour, odour and consistency and presence of blood and mucus .
- **Microscopic examination:** The specimens were examined microscopically for the presence of eggs of intestinal helminthes. All stool specimens were examined by direct saline thin smear, iodine mount and formol-ether concentration method and findings were recorded. Direct saline smear and iodine mount was chosen because of its cheapness, simple and reliable quantities. The time required for this procedure was relatively shorter and it does not require any sophistical equipments.
- **Statistical analysis:** Data were entered MS Excel and analyzed using Statistical Package for the Social Sciences (SPSS). Prevalence of disease was estimated in percentage. The proportion of intestinal helminthic infection and determinant factor such as age and sex were analyzed. Chi square test and Z test for proportion was used wherever applicable. A P-value less than 0.05 or less was considered as statistically significant.

Observation and Results:
A total 100 cases of both sexes belonging to different age groups were studied. Intestinal helminthic infection was quite common (70%) in the study population , which was statistically highly significant with a 30% negative sample.

Table I: Prevalence of intestinal helminthic ova among the study population

Number of total sample	Number of ova positive samples	Percentage (%) of posistive samples
100	70	70%

P= <0.0001,significant

Table II: Distribution of different helminthic ova

Name of the ova	Number of ova found	Percentage (%)	P Value
Ascaris lumbricoides	57	64.8%	<0.0001 (significant)
Trichuris trichura	21	23.9%	
Ancylostoma duodenale	10	11.4%	

The commonest helminthic ovum was Ascaris lumbricoides with 64.8% followed by Trichuris trichura (23.9%) and Ancylostoma duodenale (11.4%), which was statistically highly significant

Table III: Intestinal helminthic infection distribution by gender

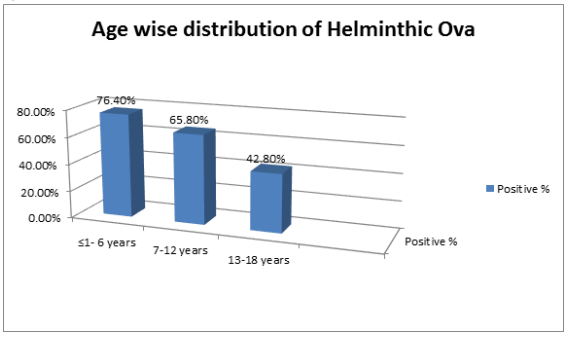
Gender	No of sample examined	Positive (%)	P Value
Male	61	42 (68.8%)	0.138 (not significant)
Female	39	24 (71.8%)	

Out of 61 samples from male 42 (68.8%) and from 39 samples of female 24 (71.8%) were positive for helminthic ova. Females suffered more than the males, which was statistically not significant.

Table IV: Age wise distribution of helminthic ova

Age group	No of sample examined	Positive (%)
≤1- 6 years	55	42 (76.4%)
7- 12 years	38	25 (65.8%)
13- 18 years	7	3 (42.8%)

Figure 1:



The maximum number of helminthic infection was seen in the age group of ≤ 1- 6 years (76.4%) followed by the age group of 7- 12 years (65.8%) and in the last age group of 13- 18 years it was 42.8%. the infection rate was decreasing with age.

Discussion:
The present study was carried out on 100 pediatric age group (both male and female) from tea community showed 70% positivity for intestinal helminthic infection with 68.8% male and 71.8% female positivity.

In our study Ascaris lumbricoides (AL) was found to be the most commonest (64.8%) helminth and it was followed by Trichuris trichiura (TT) (23.9%) and Ancylostoma duodenale (AD) (11.4%) w. The findings were in accordance with other national and international studies from countries like India, Nepal, Canada, Bangladesh, Africa etc. with some variation in study population and results. The infectivity rate was found to be 70% which is consistent with a previous study on tea garden population of Assam where prevalence was 65.4%. [3] But is higher than other studies of Bangladesh where prevalence was around 30%. [8,9] and lower than a study done in Cachar district of Assam showed 84.4% were infected with one or more intestinal parasites. [10]. In an another study done by Yeneneh H (1994) and Amare Meningster et al (2007) found 82% positivity for intestinal parasites in residents of four villages of Ethiopia. [11,12] The finding of the present study (70%) is also high in comparisons to other community based studies conducted in Saudi Arabia where overall prevalence reported to be 27.8%-32.2%. [13,14], Mehraj V et al in Pakistan (52%) [15]. Alyousefi NA, et al in Ghana (42.9%). [16] This variation might be owing to environmental hygiene differences, economic conditions, educational status and health care awareness of the people and climatic conditions. On the other hand hookworm infestation rate (11.4%) was found quite lower among children in present study than that of previously documented study (22.8%) from Vellore [15] and Bangladesh [17]. This lower rate of infection could be due to the study population are unlikely to get exposure to farm or garden work like adults.

The present result of our study reveals that the female were infected more (71.8%) than male (68.8%) . A study carried out by Walana et al in Ghana found that the infection was significantly more among male (55.5%) than female (30.8%). [16] Study by Nkengazong L et al in South West Cameroon also found that females were more affected than males. [18] Whereas a study in tea garden population of Assam showed equal distribution among male (65.6%) and female (65.1%) in 2006. [3] A study from Bangladesh also showed almost equal distribution among male (26.1%) and female (21.3%) [8] . This may be due to female have more soil contact during performing household works.

Our study found high rate of infection in the age group of ≤1- 6 years (76.4%) followed by 7- 12 years (65.8%) and 13- 18 years (42.8%). It is decreasing with the increasing age. A similar finding was reopted by Sultana et al with prevalence of 48.95% in 2-6 years of age. [8] On the hand study done by Rebecca et al showed high prevalence among 16-20 years (54%) followed by 3-5 years (50%). [1] Study from Cachar district of Assam showed high prevalence in the age group of 10-20 years. [10] . While in South India 66% prevalence was found in the age group above 10 years. [18] This wide variations might have many factors like unhealthy cultural practices and ignorance for proper hygiene. Also playing of children in dirty and filthy environment, swimming in natural water bodies, geophagic habit of children and working of women in contaminated tea garden facilitate the transmission of parasite. Anti- helminthic drug might contribute to low prevalence of infection in older age group.

Conclusion:
By analyzing the results of present study it can be concluded that intestinal helminthiic infections the study area (pediatric population of tea garden community attending Pediatric Dept of Jorhat Medical College) was very high and pose an important public health problem. This high prevalence of infection is linked with poor quality of life. Identification of high risk pockets and locally relevant risk factors could provide vital clues to the transmission of helm inthes in the tea garden community. Proper health and sanitation education, periodic chemotherapy with anti-helminthic drug, cooperation with school, various organizations and tea garden community should be prioritized as the effective helminthes infection prevention and control measures.

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