

INTESTINAL PARASITISM AMONG JIREN ELEMENTARY AND JUNIOR SECONDARY SCHOOL STUDENTS IN SOUTH-WESTERN ETHIOPIA

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ABSTRACT: A cross-sectional survey on intestinal parasites was conducted in Jiren Elementary & Junior Secondary School, Jirjira. A total of 301 stool specimens were collected by systematic random sampling from a total of 1626 population. The stools were examined for ova and parasites by direct saline suspension (wet mount) method. The result showed high prevalence rate of parasitic infection (68.4%). A total of 10 species were identified among which *Ascaris lumbricoides* was the leading (52.2%) followed by *Tricluris trichiura* (18.6%), while *Schistosoma mansoni* was the least (0.3 %). No statistically significant difference was seen in the prevalence rate of intestinal parasites by sex, ($p > 0.01$). However, there is significant association between water source for drinking and parasitoses, ($p < 0.01$), where, unprotected source of water favouring infection of all infected. Most of the infected children (92.2%) were asymptomatic. It is suggested that affective PHC strategies, such as health education in schools, expansion of school health services and chemotherapy with broad spectrum anti-helminthics should be implemented. [Ethiop. i. Health Dev. 1994;8(1):37-41]

INTRODUCTION

Intestinal parasites are present throughout the world in varying degrees of prevalence and tend to be most prevalent in developing countries. This is due to ecological and socioeconomic factors and differences in human behaviour and sanitation. Particularly in the tropics and subtropics, overpopulation, deficient sanitary facilities and absence of potable water are the causes (1).

Similarly in Ethiopia, (one of the developing countries) intestinal parasitism is widespread largely due to poverty, poor sanitation and ignorance of health promotion practices (2). Helminthiasis is the second most common cause of out-patient morbidity in Ethiopia, next to dysenteries and gastroenteritis (2). *Ascaris lumbricoides* tend to have the leading prevalence in many studies usually followed by *Trichuris trichiura* (3,4,5,6). The Keffa region was found to have the highest rate of *Ascaris lumbricoides* in Ethiopia (3,7). Similarly highest rates were seen for *Trichuris trichiura*, Hookworm and *Strongyloides stercoralis* (3). The principal aim of the present study was to determine the prevalence of intestinal parasitism among students of Jiren Elementary and Junior Secondary School with emphasis on its relationship to the source of drinking water and pattern of symptomatology.

METHODS

Across-sectional survey to determine the prevalence of intestinal parasitism was conducted among children attending Jiren Elementary and Junior Secondary School in Jima, in November 1990. A sample of 305 students were selected using systematic random sampling techniques from a total population of 1626. Stool specimens were taken from 301 of the students included in the study population and examined by laboratory technicians. A direct saline suspension ("wet mount") technique was used. Types of ova, cysts and trophozoites were recorded. Each student was interviewed for the source of drinking water in his/her home and the means of excreta disposal system. Moreover, individuals with positive stool examination were enquired for symptoms

suggestive of intestinal parasitism using questionnaire. In order to prevent bias, they were not informed about the result of their stool examination until enquiry on symptomatology was made. Recording of sign and symptoms was done by intern medical, students. Mainly descriptive statistics was used in data analysis. The association between infection by a parasite and source of water was tested by chi-square method and difference was accepted at a probability level of 1% .

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RESULTS

Out of the 305 samples students, 301 submitted stool specimens making a 98.7% coverage.

The overall prevalence rate of intestinal parasites was 68.4% (with 95% confidence interval of 66.0-70.8%). A total of 10 species were identified (Table 1). *Ascaris lumbricoides* was the most prevalent, 157 (52.2%). *Trichuris trichiura* was second, 56 (18.6%), while *Schistosoma mansoni* was the least, 1 (0.3%). Hundred and six (75.7%) of the 140 children aged 5-9 were positive for parasites, the comparative values for age groups 10-14 and 15- 19 were 97 (62.2%) and 3 (60.0%) respectively. The majority of males, 111 (71.2%) were found to have one or more parasites and the infection rate for females was 95 (65.5%), however, there was no statistical difference by sex, $\chi^2 = 1.107$ ($P > 0.01$). (Table 2) Further analysis of the results showed that of the infected students 113 (54.8%), 77(37.4%), 14(6.8%) and 2(1.0%) had one, two three and four species of parasites respectively. Grossly, 31.0 % of the students had multiple parasites.

The sources of water for drinking were pipe 125(41.5%), unprotected wells 82(27.2%), protected wells 60(19.9%), unprotected spring 27(9.0%), protected spring 2(7.0%) and river 5(1.7%). There was a significant association between parasitism and the sources of water supply, children with unprotected source of water in their home having higher risk of acquiring intestinal parasitoses, $\chi^2 = 9.4$ ($P < 0.01$). Nevertheless it was insignificant when *Ascaris lumbricoides* and *Trichuris trichiura* were excluded from the test, $\chi^2 = 1.92$ ($P > 0.01$). From all surveyed 245 (81.4%) had reported availability of latrine facilities in their homes. "

During the survey only 16(7.8%) of those with positive stool examinations were symptomatic (table 2). Among the symptoms the most common was abdominal cramp 15(7.3%). The other signs and symptoms were mucoid and/or bloody diarrhea 6(2.9%).. watery diarrhea 1(0.5%), nausea and/or vomiting 2(1.0%) and anorexia 1(0.5%) table 2).

Among the symptomatic children those with only one symptom were 11(68.8%), while 4(25.0%) and 1(6.2%) had 2 and 3 symptoms respectively. One student with negative stool for ova and parasite was found to have bloody and mucoid diarrhea; however there were many motile bacteria with abundant leucocytes ("pus cells") in the stool perhaps an indication of bacterial infection.

DISCUSSION

Eventhough a less sensitive method was used in this study, some comparisons were made with other studies done in Ethiopia using standard methods of detecting parasitism. So, this limitation should not be disregarded where comparisons are considered.

As is expected in a developing country, the overall prevalence rate of parasitism (68.4%) was generally very high. However, this was lower than the value for a rural elementary school in Gute (8). The finding was higher than that of the elementary & Junior high schools in Wonji-Shoa Sugar Estate (4). When the point prevalence rate of *A.lumbricoides* (52.2%) was taken alone it was found to be similar to the results in Akaki town (5) although it was lower than the value for the Keffa region (3, 7) and that of the elementary school in Gute (8). Other studies done elsewhere in Ethiopia showed lower rates for *A.lumbricoides* (4, 5, 6). In general the higher prevalence rate can be explained by the inadequate potable water source, lower level of sanitation, poor excreta disposal system and personal hygiene which are common problems of developing countries.

The insignificant difference in intestinal parasitoses by sex was similar to that the settlement village in Sidamo (9), but was in contrast with the cases among the students in Wonji-Shoa Sugar Estate (4) and farming cooperatives in Gondar (1 (1) where a higher rate was evident among males

When the prevalence rate of each species was considered *A.lubricoides* was the leading followed by *T.trichiura*. A similar pattern was seen in different studies (3,4,5,6). The prevalence rate of *S.mansoni* was 0.3%, markedly lower than the value for the Keffa region reported by Shibiru (3). It was also lower when compared to other studies (4,5). This could be partly explained by the less sensitive laboratory technique used in this study.

Eventhough greater proportion of students (81.4%) professed to have latrine facilities in their homes, the proper usage and utility is still questionable, especially by the children.

The significant association of unprotected water source to intestinal parasitoses could be due to the higher rates of *A. lumbricoides* and *T. trichiura*. Therefore, the role of poor personal hygiene, absence of footwear, swimming and bathing in rivers should not be underestimated.

The pattern of responses symptomatology in respondents was in no way different from the findings of other studies (1,6) which indicated that most of the subjects (92.2%) were asymptomatic eventhough they were infected with one or more parasites. However, some severe illnesses can occur particularly in heavy infections., These include intestinal obstruction, pulmonary symptoms during the migration through the lungs, anaemia caused by hookworm and Portal hypertension plus ascites in schistosomiasis.

The prevalence rate of hookworm (10.3%) was markedly high and its. impact on health; needs great considerable n. Anaemia caused by this worm may sometimes markedly affect the health of the patient to the extent of facilitating death, especially when associated with other diseases. This is important particularly in the tropics where there is high prevalence of malaria and other causes of anaemia such as nutritional deficiencies.

In conclusion, the high prevalence rate of intestinal parasitism found in this study - eventually draws consideration as a significant health problem to be tackled through the principles of priarmary health care; thus, effecting the components of the PHC strategy. For example, proper sanitation, safe water supply and provision of essential drugs are recommended. Besides, health education programmes should be incorporated as part of the routine teaching activities in schools.

In addition, expansion of school health services and wide spread use of broad -spectrum anti-helminthic drugs need great attention.

Table 1. Number of Male & Female Students Positive for One or More parasite (s)

Parasite species	Male	Female	Total (both sexes)
	N= 156	N= 145	N= 301
Ascaris Imbricoides	8(51.9)*	76(52.4)	157(52.2)
Trichuris trichiura	25(16.0)	3(21.4)	56(18.6)
Hookworm SP	22(14.1)	9(6.2)	31(10.3)
Strongloides stercoralis	5(3.2)	4(2.8)	9(3.0)
Entrobilus vermicularis	1(0.6)	1(0.7)	2(0.7)
Hymnolepis nana	5(3.2)	3(2.1)	8(2.7)
Hymnolepis diminuta	- -	3(2.1)	3(1.0)
Schistosma mansoni	1(0.6)	-	1(0.3)
Ertamolbes histolytica	17(0.9)	21(14.5)	38(12.6)
Giardia lambilia	3(1.9)	8(5.5)	11(3.7)
Total	111(71.2)	95(65.5)	206(68.4)

N.B. Figures in parenthesis are percentages
Total positive for one or more parasite species

Table 2. Signs & Symptoms to Those Children Found Positive for One or More Parasites.

Signs & symptoms	Number (percent)
	N = 206
Abdominal pain	15(7.3)
Muroid and/or bloody diarrhea	6(2.9)
Nausea and/or vomiting	2(1.0)
Watery diarrhea	1(0.5)
Anorexia	1(0.5)
Total	16(7.8)

* Total children with one or more signs and symptoms.

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