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Full Length Research Paper

Prevalence of intestinal parasitic infections among primary school attending students in Barandooz-Chay rural region of Urmia, West Azerbaijan province, Iran in 2008

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Duplicate stool specimens from 405 primary school attending students of Barandooz-Chay region of Urmia district were tested for intestinal parasites. Besides, duplicate scotch tape slides were obtained and examined microscopically for *Enterobius vermicularis* and *Taenia* sp. eggs. A questionnaire containing demographic data was filled for every case, and the relationship between them and the parasitic infection was assayed. Overall, intestinal parasitic prevalence was 42.5%. Prevalence of *Giardia lamblia*, *Entamoeba coli*, *Blastocystis hominis*, *Iodamoeba butschlii*, *Enterobius vermicularis* and *Hymenolepis nana* was 20.5, 14.6, 13.3, 2.5, 10.6 and 0.2%, respectively. No statistic relation was proved between these infections, having tap water facility at home or family population (except for *E. vermicularis*), but there was a significant relationship between parents' education level and family population. According to relatively high prevalence of parasitic infections in the study field, it is necessary to increase hygienic and educational measures.

Key words: Prevalence, intestinal parasites, primary school, Urmia.

INTRODUCTION

Intestinal parasitic infections are still a serious public health problem in the world. It is estimated that some 3.5 billion people are affected, and 450 million are ill as a result of these infections, the majority being children (WHO, 1998). The high prevalence in children is attributed to many factors, particularly the social and economical situation of the individuals, which is the important cause of the prevalence of intestinal parasites, in addition to environmental, poor sanitary and personal hygiene (Scolari et al., 2000).

As a result of the epidemiologic studies during the last years in Iran, the high prevalence of intestinal parasites in school children have been widely reported in many areas (Fallah et al., 2004; Hazrati et al., 2006).

The aim of this study was to determine the prevalence of intestinal parasitic infections in Urmia city from 7 to 14 year old school children and its relation to the education of parents, age, family and environmental factors related to intestinal infections.

MATERIALS AND METHODS

The design used for the study was a cross-sectional design. This study was conducted at nine primary schools, chosen by randomized cluster sampling, from urban areas of Urmia city (the capital of West Azerbaijan province), located in the Northwest of Iran. The sample size was calculated on a prevalence of 40%

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Table 1. Number of family members and education of parents' related prevalence of intestinal parasitic infections.

Number of family members	3	4	5	6 and more
% prevalence of intestinal parasitic infection	39.6	43	38.2	50
Education of father	No education	Primary school	Secondary school	High school and more
% prevalence of intestinal parasitic infection	49	44.7	41.7	32.1
Education of mother	No education	Primary school	Secondary school	High school and more
% prevalence of intestinal parasitic infection	44.3	43.3	42.7	30

Table 2. Number of family members and related education of fathers and mothers.

Education of father	Number of family members								Total
	3		4		5		6		
	n	%	n	%	n	%	n	%	
No education	5	8.5	17	28.8	17	28.8	20	33.9	59
Primary school	21	9.7	102	47	52	24	42	19.4	217
Secondary school	12	12.5	63	65.6	19	19.8	2	2.1	96
High school and more	10	33.3	17	56.7	1	3.3	2	6.7	30
Education of mother									
No education	6	12.2	16	32.7	9	18.4	18	36.7	49
Primary school	17	9	85	45.2	45	23.9	41	21.8	188
Secondary school	14	13	63	58.3	27	25	4	3.7	108
High school and more	11	19.6	36	64.3	8	14.3	1	1.8	56

d=0.05, at a confidence level of 95%. So, the calculated study population size was 405. The school lists, for all children in grade one to four, in all nine primary schools in Urmia city were prepared. A total of 405 primary school children were randomly selected from the lists of nine schools. The questionnaire contained age, gender, residence, education and occupation of parents, number of family and water supply. Stool samples of each student were collected in labeled plastic vials without preservatives. They were examined for intestinal parasites by wet mount and formalin-ether sedimentation techniques, and cellophane tape was used to detect *Enterobius vermicularis* infection. Data were analyzed using SPSS 11 for windows pocket program.

RESULTS

The subjects consisted of 246 (60.7%) boys and 159 (39.3%) girls, aged between 6 and 12 years. In all, 172 students (42.5%) were infected with one or more intestinal parasites. The most common was *Giardia lamblia* [83 (20.5%)], *Entamoeba coli* [59 (14.6%)], *Blastocystis hominis* [54 (13.3%)], *E. vermicularis* [43 (10.6%)], *Iodamoeba butschilii* [10 (2.5%)] and *Hymenolepis nana* [1 (0.2%)], which infected primary school children. A total of 109 (26.9%) students were infected with one parasite, 54 (13.3%) with two parasites, 7 (1.7%) with three parasites and 3 (0.7%) with four parasites species.

The number of family members and education of parents' related prevalence of intestinal parasitic infections among primary school children is given in Table 1. Significant relation, observed in the education of parents and number of family members, is given in Table 2. The age prevalence of intestinal protozoan and intestinal parasitic infections are shown in Figures 1 and 2, respectively.

DISCUSSION

The overall prevalence of intestinal parasites in Barandooz-Chay area of Urmia was 42.5%, which was much lower than the prevalence in the rural area of Silvana (52.6%), the southwest region of Urmia (Mostaghim et al., 2005). The results of the present investigation indicated that the total prevalence of intestinal protozoa infection was 31.6% among students of Barandooz-Chay area in Urmia and the prevalence of

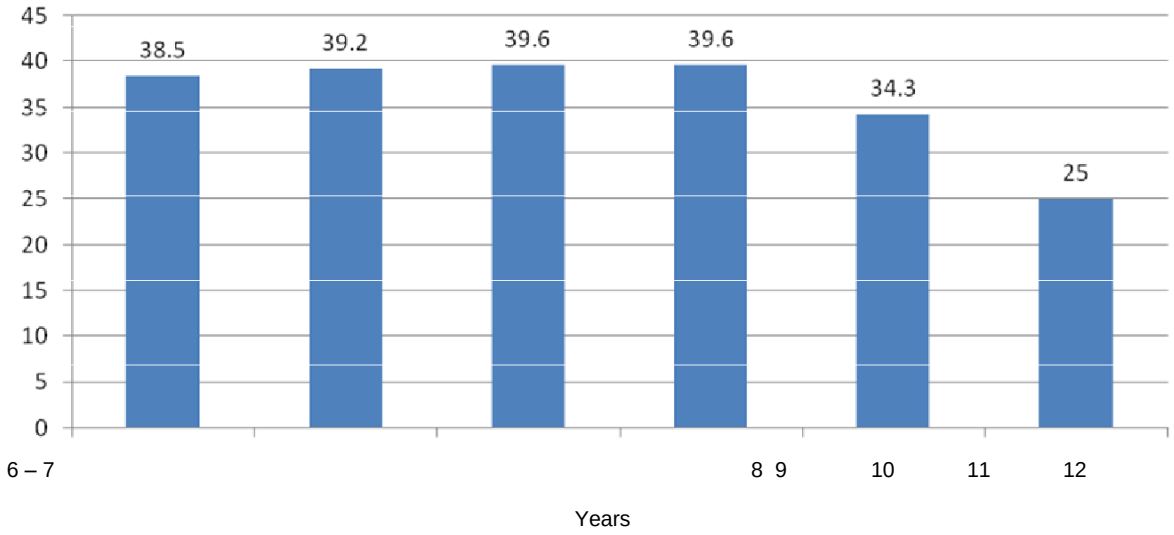

Figure 1. Age-prevalence of intestinal protozoan infections.

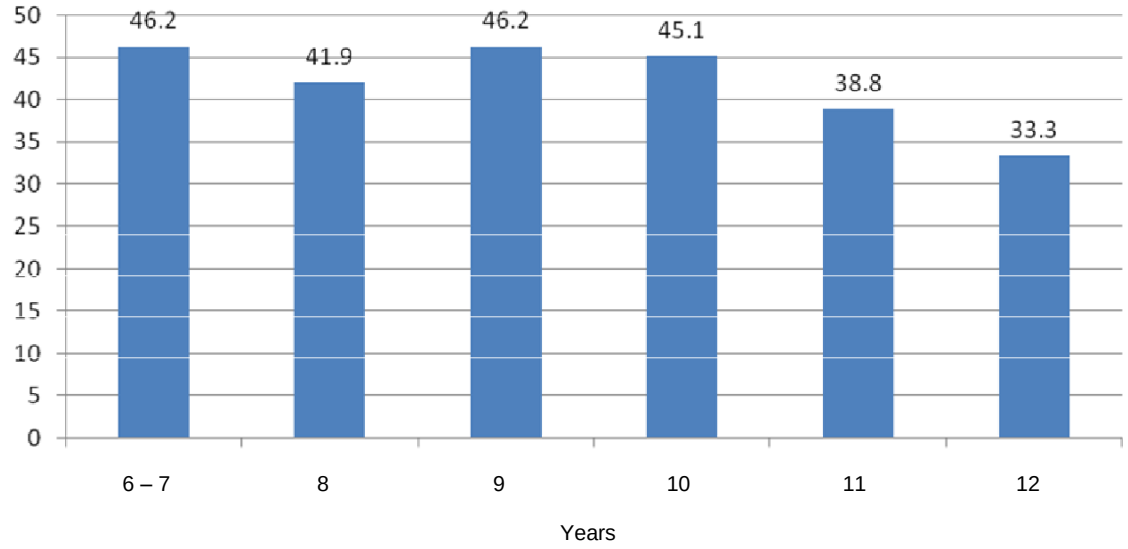

Figure 2. Age-prevalence of intestinal parasitic infections.

intestinal helminthes infection was 10.9% in the primary school children. The results of a study, which was completed by Hazrati Tappeh in 2005, showed that prevalence of protozoan infection was 28.4% in Nazloo (a region also in the Northwest part of Urmia) . The prevalence of the protozoan parasites was 10.3% for *G. lamblia* and 10% for *E. coli*, being the two most common infections, as was observed in the Nazloo region in Urmia (Hazrati et al., 2006). A comparison of the prevalence indicated that *G. lamblia* with 20.5%, *E. coli* with 14.6% and *B. hominis* with 13.3% were higher than other infections in Urmia, and this was estimated because the socioeconomic and environmental conditions were lower.

Abundance of helminthes infections was reported for *E. vermicularis* (24.9%), *H. nana* (1.14%) and *A. lumbricoides* (0.28%), by Mostaghim et al. (2005). Another study by Hazrati et al. (2006) reported infections for *E. vermicularis* (28.4%) and *H. nana* (0.4%), while the present study indicated infections for *E. vermicularis* (10.6%) and *H. nana* (0.2%). Low prevalence of *E. vermicularis* in this study might be due to the fact that the socioeconomic and environmental conditions were better. Several studies until 2004 in Hamadan city, west of Iran, have showed that prevalence of *A. lumbricoides* was higher, in comparison with other states. In those years, the mean infection rate of *A. lumbricoides* was 19.5%

(Fallah et al., 2004). In this study, infection of *A. lumbricoides* was not reported in Barandooz-Chay, which was as a result of the avoidance of human fertilizers used by farmers. In 2004, Okyay et al. (2004) worked on the prevalence of intestinal parasites among primary school children in Aydin, a city in the western part of Turkey. The results showed that 145 (31.8%) were infected with one or more intestinal parasites. The most common was *E. vermicularis* with 83 (18.2%) infected children, the second was *G. lamblia* with 49 (10.7%) infected children and the third was *E. coli* with 36 (7.9%) infected children. In the present study, infection of protozoan, especially *G. lamblia*, is higher than helminthes infections.

The results of this study indicate high prevalence of some intestinal protozoa, especially *G. lamblia*, and a great amount of helminthes in the area. In contrast, based on the present study and other studies in various areas, the intestinal parasite infections in the world is one of the most important health indexes. In spite of its different prevalence in various societies and ages due to decrease or eradication, intestinal protozoan infections, especially giardiasis and amebiasis, are very important problems that societies are suffering from. High prevalence of *G. lamblia* in Barandooz-Chay region, in comparison with other parts of Iran, shows a necessity for more studies and a derivation of a solution for the problem.

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