Original Article

Prevalence of Intestinal Parasites in Children Attending Day–Care Centers in Yazd City, Iran

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Abstract

Introduction: Intestinal parasitic infections are very common in developing countries and affect mostly children. Day care centers are places where children are more susceptible to acquire intestinal parasite**s.**

Material and Methods: This cross-sectional study was conducted to determine the prevalence of intestinal parasites among children who attend to day care centers in Yazd city. One hundred and eighty children under six years old were selected by cluster sampling. Fresh faecal samples were collected from each child and examined by direct wet mount and formalin-ether techniques. Demography data and anthropometric indicators of children were also recorded. The obtained data were analyzed using SPSS software and the significance was tested using the chi-square test.

Results: In total 10 % of children harbored at least one type of intestinal parasite. The rates of infection were as follows: Blastocystis hominis 2.8%, Giardia lamblia 2.8%, Entamoeba coli 1.1%, Chilomastix mesnili 1.7%, Dientamoeba fragilis 1.1.%. Infection rate was 12.9% and 6.9% in males and females respectively. The relationship between sex, age, anthropometric indicators, and parasitic infection was not statistically significant. A statistically significant difference was observed between infection, parents' education and mothers' job ($P<0.005$).

Conclusion: The results of this study, showed a considerable decrease in the rate of intestinal parasitic infections in comparison with other studies. This may be owing to the improvements in personal environment and health which have occurred through public education campaigns, health information raising, sanitation .facilities improvement, proper waste and wastewater disposal, control of drinking-water, and food safety

Keywords: Intestinal Parasites, Children, Day–Care Centers, Yazd

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Introduction

Intestinal parasitic infections are widely spread throughout the world especially in children from developing countries [1]. These infections cause malabsorption, malnutrition and impair children's growth and development [2, 3, 4]. It is estimated that three billion people are infected with intestinal parasites and children are more susceptible and greater risk population [5]. The prevalence of intestinal parasites varies across different parts of the world [6]. Although parasitic infections are more common in developing countries they also pose a serious threat for human health in developed countries due to travel, trade, and immigration [7]. Day care centers are places where children are more susceptible to acquire intestinal parasite**s**, due to ignorance, the lower level of safety, direct contacts and sharing toys with other children [8,9]. The prevalence of intestinal parasites in children under six years old in some countries, such as; Cuba 45.2% [8], Sri Lanka 24% [10], Argentina 54% [11], children of immigrants from East Africa 50% [12], and children in day care centers of Venezuela 62%[13], as well as Iraq 72% [14] has been reported.

The prevalence of intestinal parasites among preschool children of day care centers in some cities of Iran has been reported; in Zahedan 42% [9], in southeast Tehran, 31.3% [15], in Shahrood 53.8 % [16], in Damghan 68.1% [17], in Bam 47% [18] and Babol, 44% [19]. Among the protozoa, Giardia lamblia and Entamoeba histolytica have been associated with persistent and acute diarrhea [20, 21], while Blastocysts hominis and Cryptosporidium parvum tend to cause marked symptoms primarily in immunocompromised hosts [22]. Occasionally there are cases of giardiasis outbreaks in day care centers [23, 24]. This study aims to determine the prevalence of intestinal parasites in some day-care centers in Yazd city.

Materials and Methods

This cross-sectional study was carried out from Sept. 2012 to Feb. 2013. In this survey, 180 children aged less than six years old were selected by cluster sampling from 12 day care centers of Yazd. Parents signed the free informed consent form agreeing to the participation of the children. The children, apparently in good health condition and having had no history of medication one month before the study commencement, entered the study. Each parent was given a plastic box including a small container; in addition, they were asked to provide a stool sample from their children on the next visit. Each container was marked with the name of the subject who had been enrolled in the study. At the second visit, the containers were collected and sent to the laboratory at paramedical faculty of Yazd University of Medical Sciences. Stool specimens were examined for the parasitic forms using wet mount and formol-ether concentration techniques [25]. Demographic data; socioeconomic status; job and education level of parents were recorded. The data were analyzed using SPSS statistics 16.0 software. A Pearson's Chi-square (X^2) on proportion was

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used to test the associations between each variable.

Results

A total of 180 children were included, 935 (551.7%) male, and 87 (48.3%) female. The overall intestinal parasitic infection rate was 10%. Figure 1 shows five protozoa of the parasites that were identified in the samples. The most prevalent parasites were G. lamblia and B. hominis (2.8%). There was no statistically significant relationship between age, sex, and anthropometric indicators as well as the prevalence of intestinal infections. The anthropometric measurement of children in the present study was compared with an international reference population defined by the U.S. National Centre for Health Statistics (NCHS). The indicator of weight-for age showed that 17.2% and 11.1% of children were underweight and obese respectively, and the rest were in the normal range. Parasitic infection was more prevalent in children whose parents had no high education (Table 1). The result showed a statistically significant relationship between parents' education and infection (P<0.001). A statistically significant difference was seen between infection rate and mothers' job (P<0.005) (Table 1).

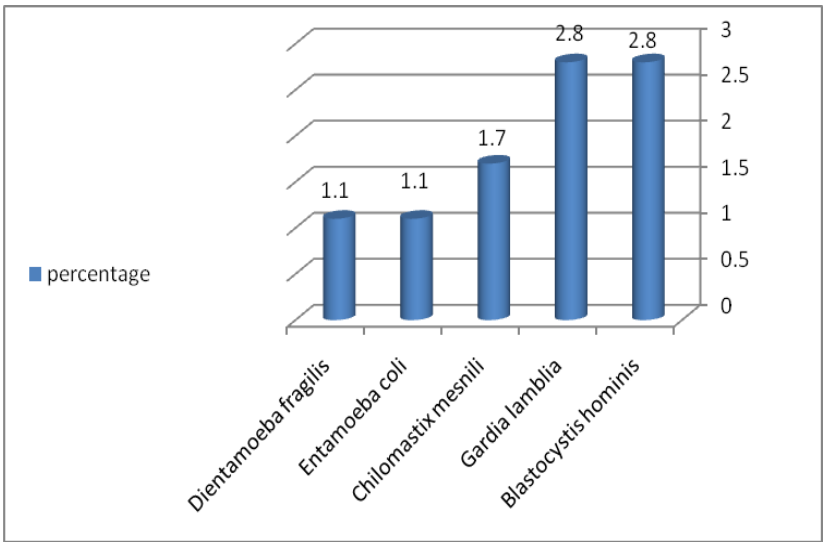

Figure 1: The prevalence of intestinal protozoan infections among children in day-care centers in Yazd-Iran

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Table 1: The prevalence of intestinal parasites among children in day-care centers in Yazd and the level of parents' education

	Prevalence		Positive		Negative	
Level of Education	Number	Percent	Number	Percent	Total No.	Total %
Primary	4	40	6	60	10	5.6
Secondary	6	24	19	76	25	13.9
Diploma	3	4.8	59	95.2	62	34.4
Academic	5	6	78	94	83	46.1
Total	18	10	162	90	180	100

χ^2=18.737 df =3 P= .000

Table 2: The prevalence of intestinal parasites among children in day-care centers in Yazd according to mothers' job

Prevalence	Positive		Negative			
Mothers' job	Number	Percent	Number	Percent	Total No.	Total %
Housewife	11	17.2	53	82.8	64	35.6
Employee	7	6	109	94	116	64.6
Total	18	10	162	90	180	100

χ^2=5.700 df =1 P= .017

Discussion

The current study provides the first study estimation of parasite prevalence among children of day-care centers in Yazd city. In comparison with the results of related studies on intestinal parasitic infection in day-care centers in other parts of Iran [15, 17, 19], the present prevalence is low. The results are in agreement with those of the study of parasitic infections in kindergartens of Zanjan city which was reported as 10.25% by Atayian et al. [26]. A review of previous studies indicates a high infection rate of intestinal parasites in different parts of the country.

The infection rate in the city of Sabzevar was 53.3% [16], in Sirjan 58.3% [27], and in Tabriz 63.8% [28], in the villages of Tonekabon and Ramsar 62.4% [29], and in rural regions of Borkhar and Meimeh 635% [30]. This study did not show any intestinal worm infections. The low rate of intestinal protozoan infection and lack of intestinal worms in the present study may be due to the hot weather, dry season, the particular climatic conditions, and improved

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environmental health [31]. Awareness raising and increasing the level of individual and public health cares in recent years may be reasons for reduction of intestinal parasitic infections. The greater frequency of intestinal parasite occurred among children whose parents had a low level of education in this study which shows a close agreement with Heidari's research [17], Kalantari's observation [19], and Machado's [24].

It is more likely that parents of children at high levels of education provide better sanitation conditions for their kids. The results of the study showed that the prevalence of intestinal parasites among children whose mothers were housewives was higher than those whose mothers were employees.

This may be related to less knowledge and awareness of housewife mothers about control and prevention of parasitic intestinal infections.

Conclusion

Finally, performing stool exam when accepting children in kindergarten, periodic tests, health education, and sanitary measures are essential to the control of intestinal parasitic diseases in these day-care centers. As a prophylactic measure, parents should keep their children's nails short and clean. Day-care centers must be provided with toilet facilities and the stool must be done on a regular basis in day-care centers every year.

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