Enteric Parasites in Patients Referred to Health Centers of Qom –Iran 2007-2009

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Abstract:Aim: The current study was performed to determine the prevalence of intestinal parasitic infections in patients referred to health centers of Qom province. **Materials and Methods:**This descriptive cross-sectional study was performed on stool specimens from patients referred to the health centers of Qom province.The samples were tested using formalin-ether concentration and Graham methods.**Results:**Within the 117,403 fecal samples evaluated; protozoa, *Giardia*, and then *Entamoeba coli* were the most frequently observed parasites. The lowest infection rate was related to *Oxyuris*.The three-year prevalence percentage was determined to be 6.5 %.Most infections occurred in spring and summer, in the age group below 10, and in residents of suburbs and villages. The Infection rates were almost similar in the two sexes. **Conclusion:** A significant relationship was observed between the rate of infection and age groups,season, and place of residence (P<0.005), but sex was not related to the rate of infection.
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Introduction

Parasitic diseases are among the major health problems and also barriers to the socioeconomic development of most countries, especially the developing ones. Infectious diseases should be addressed as a global concern. Ecological changes have been accompanied with changes in technological, socioeconomic, environmental, and demographic conditions. Population movement from one place to another and evolution of parasites into drug-resistant strains have made parasitic diseases a serious threat in both developing and developed countries.Climatic conditions, humidity of the area, temperature, population density, public health, and even diet are effective on the prevalence of parasitic diseases in each region. The rate of infection by intestinal protozoa is growing in different Iranian age groups,and its prevalence has increased in comparison with the prevalence of helminth infections. Considering the increased public awareness, development of health systems, and not using human waste as fertilizer; the rate of intestinal helminth infections has declined [1-3].Studying the prevalence of parasitic infection can help those in charge of health affairs provide health services on the basis of update information.

Materials and methods

This descriptive cross-sectional study used the data available in health centers of Qom province. Stool samples from all those who were referred to nine health centers (Imam, Imam Hassan Askari, Zahra, Jafarieh, Hajji Abad, Dastjerd, Mosque, Central, and Kahak) of Qom province were examined.It took fairly a long time between collection of the samples and their transfer to the laboratory, and the samples were collected in formalin. Each patient was given a package including aquestionnaire, small container, one slide, and scotch tape. The patients were asked to provide a stool sample and slide scotch tape on the next visit. Each container was marked with the name of the subject. Stool samples were examined by direct test using physiological serum or Lugol solution for three times. Stool specimens were examined for the parasite eggs,cysts, and larvae using formol-ether concentration method described earlier. Scotch tape slides were examined for Oxyure eggs [4]. The patients referred completed a short questionnaire that included their name, age, sex,season the sampling was performed,and place of residence.

Statistical analysis

Chi-squared test in SPSS software version 13.5 was performed to associate between the prevalence of intestinal parasitic infection and age, sex, seasons, Place of residence.

Results

Among the 117,403 stool samples studied, 4817 (4.1%), 1637 (1.18%), 1000 (0.85%), 308 (0.26%), 99(0.08%),52 (0.04%), and 8(0.006%) samples were positive for *Giardia lamblia*, *Entamoeba coli, Blastocystis hominis, Entamoeba histolytica, Hymenolepis nana, Taenia saginata,* and *Enterobius vermicularis*, respectively.The overall prevalence of the protozoan parasites was 6.5 %. However, the prevalence of pathogen parasites was 4.5 %. From 2007 to 2009, the number of patients referred to the health centers declined. In 2008, most positive cases of *E. coli* and *Giardia lamblia* were recorded. The highest frequency of infection was observed for protozoan infections. The number of patients was higher in spring and summer.Most cases of infection occurred in the age group under 10 and in residents of suburbs and villages. The Infection rates were almost similar in the two sexes (Table 1 and 2).

Table1. Characteristics of samples during 2007-2009

Year	2007	2008	2009
Number of patients referred	40505	39290	37608
Parasite species			
Giardia	1269	1975	1573
E. coli	539	840	258
B. hominis	600	300	100
E.histolytica	75	91	142
H.nana	19	47	33
T.saginata	30	10	10
Oxyuris	4	3	1
Season			
Spring	1500	1000	500
Summer	1800	500	500
Autumn	820	300	320
Winter	300	200	180
residence			
Urban areas	1500	900	600
Surroundings and outskirt villages	3000	1000	919

Table2. Distribution of infected individuals according to age and sex over the three years ofstudy.

Gender / Age	Male	Female
Under 10	2300	2400
10–20	900	700
Above 20	620	999
Total	3820	4099

A significant relationship was observed between the rate of infection and age groups, season, and place of residence ($P<0.005$), but sex was not related to the rate of infection.

Discussion

Epidemiological data on the rate of parasitic infections in recent years are not available in Qom province.The frequency and severity of the infection is much higher in undeveloped countries in comparison with the industrialized ones. In the Kermanshah Health and Disease Program, carried out by the Ministry of Health, the prevalence of *Giardia lamblia* and *Ascaris* were the highest.According to studies performed in Kermanshah, from 45,160 individuals referred for laboratory evaluation, 26,705were infected; 94% and 6% with protozoa and helminths, respectively.*Giardia* was the main cause of infections.In another study in Bandar-Abbas, Southern Iran, the commonest protozoan parasites were *Blastocystis hominis* (25.53%), *Giardia lamblia* (17.2%), and *Entamoeba coli* (15.95%).According to studies performed in Tehran,the rate of intestinal parasites, especially helminthic infections have decreased during recent years.In the USA, the most prevalent parasite is *Giardia*, and asymptomatic carriers comprise 3-7% of the population.In China, the prevalence rates of *Ascaris*,*Trichocephalus*, and *Taenia* were reported to be 47%, 18.8%, and 17.2%, respectively. In Brazil,the most frequent parasitic infection was *Giardiasis*.The frequency of protozoan and helminth parasites were found to be 34.1% (47/138) and 2.9% (4/138) in the fecal samples examined, respectively. In the studies performed in Turkey, the prevalence rates of protozoan and helminth parasites were reported as 34.1% (47/138) and 2.9% (4/138) in the fecal samples examined, respectively [5-11]. In the studies carried out in Khuzestan and Hamadan provinces, and also in most studies in other parts of the world, most cases of parasitic infections occur in early years of life. The higher frequency of parasitic infections in the age group below 10 can be related to their susceptibility to parasitic infections, poor health conditions, and more social contacts with their peers, which facilitate the parasite transmission.In most studies, there is not a statistically significant relationship between sex and the risk of parasitic infection.In this study, most infected individuals lived in out skirt villages and surroundings of Qom. In the study conducted in Haiti, it was shown that the prevalence of parasitic infections was higher in rural population, and there was not a significant relationship between the rate of parasitic infections on the one hand, and age and sex on the other hand.In the studies carried out in the United States,prevalence of infection was the lowest (22-27%) in winter. The high number of infection cases in spring and summer is probably due to

consumption of contaminated vegetables and fruits in late spring and early summer, which leads to higher number of patients referred for laboratory examination of parasitic infections.The overall decrease in the prevalence of soil-borne parasitic infections in Iran in recent years is related to improved health status,not using human waste as fertilizer, and following food and personal health measures. The high frequency of the protozoan infections can be attributed to their ease of transmission, their rapid propagation, highly resistant protozoan cysts, which can resist outside the body for months, unsanitary water supplies,and probable increase in the population of arthropods and their role as the mechanical vectors of the parasite.

Owing to different climate condition, diet, health status, the population density, and the immune system condition of different individuals; frequency of parasitic infections is different in various areas[12-17].However, regardless of the ecological differences between areas of different studies, the differences in the results of studies can be due to lack of trained staff for diagnosis of parasitic diseases in all studies.

Conclusion

In general, the prevalence of parasitic infections was low in Qom province. This can be due to the warm and dry climate of the region, not using human waste as fertilizer, using chemical fertilizers instead of human and animal waste in agriculture, improved public awareness, and following personal health measures.

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