



Protozoan Infections of Restaurant Workers in Tabriz, Iran

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Abstract

Objective: The aim of the present study was to determine the rate of contamination with intestinal protozoan parasites among restaurant workers in Tabriz (center of East Azerbaijan province), Iran.

Materials and Methods: To identify intestinal protozoan parasites among restaurant workers in Tabriz (East Azerbaijan province), Iran, in 2013, stool specimens were collected and examined from a total of 100 restaurant workers at the School of Veterinary Medicine, Islamic Azad University, Tabriz Branch. In the present study, the direct-smear examination, saline sedimentation, and Trichrome staining techniques were used.

Results: The positivity in the majority of them was single infection; however, 4 cases were double infection that constituted 1% of the prevalence. The prevalence of *Entamoeba histolytica*/dispor was 47.22%, *Giardia lamblia* 16.66%, and *Entamoeba coli* 36.11%. The double infection was only observed with *E. histolytica*/dispor and *Giardia*. The infection caused by these parasites was also accompanied by abdominal troubles, diarrhea, constipation, nausea, and vomiting.

Conclusion: These results lead to the understanding that sanitary measurements are not effective, and these hazardous situations facilitate the distribution of parasitic agents among consumers. The current pre-employment screening policies must be performed annually in order to be effective and systematic surveillance is needed in addition to health education.

Keywords: Protozoan Infections, Restaurant Workers, Tabriz

Introduction

Surveys on intestinal parasites among restaurant workers have been performed all around the world (1-3). Shojaei et al. have shown the effectiveness of hand washing by Iranian restaurant workers in decreasing food microbial infection (4). The aim of the present study was the determination of the rate of contamination with intestinal protozoan parasites among restaurant workers (foodhandlers) in Tabriz (center of East Azerbaijan province), Iran. This group of restaurant workers has a very important role in the distribution of parasitic agents due to their direct contact with different classes of society.

Materials and Methods

This was a cross-sectional study performed from February 2012 to February 2013 in Tabriz, Iran, in

order to determine the rate of contamination with intestinal protozoan parasites among restaurants workers. A total of 100 restaurant workers were submitted to answer the survey questionnaire. This questionnaire consisted of valid hygiene certificate, and questions on symptoms of parasitic disease, education level, workers literacy, and etcetera. They were delivered to restaurant workers for completing. Moreover, the participants were examined by one clinical doctor, and then, some fresh fecal samples were collected from them. All 100 (100%) restaurant workers cooperated. All fecal samples were examined by 3 fecal examination methods (direct-smear examination, saline sedimentation, and Trichrome staining) in the parasitology laboratory of the School of Veterinary Medicine of Islamic Azad University, Tabriz Branch (5).

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Results

Table 1 demonstrates the prevalence rate of intestinal protozoan parasites among restaurant workers in Tabriz. The highest contamination rate was that of *Entamoeba histolytica* with 47.22%. Table 2 shows the education level of the participants.

Discussion

Parasitic infections are of great importance due to the threat and danger they pose to human life. The World Health Organization (WHO) has reported that diseases caused by infected food are one of largest hygienic problems in the world (6). Multilateral identification of parasites, especially their distribution agents (eggs and cysts), is a secure way of determining the prevalence rate of parasites in societies. Restaurant workers are prone to distributing parasitic infections because they have direct contact with restaurant customers. The individuals infected with intestinal parasites can greatly influence the general hygiene of a society, especially if they work in a shopping center; therefore, they are considered as a reservoir and source for parasitic infections (7).

Intestinal parasites have been reported in restaurant workers of many countries (8,9). In Brazil, Saudi Arabia, and Yamane a prevalence rate of 44.9, 31.4, and 28.7 percent have been reported, respectively. In Tabriz, a 33% rate of intestinal parasites has been reported in restaurant workers (10). The prevalence rate of intestinal parasites in restaurant workers of Tabriz, in comparison with previous studies, is average. Furthermore, in this study, many parasites in restaurant workers were not identified. *Entamoeba histolytica*/dispor and *Entamoeba coli* had the highest infestation rate in this study and the most observed clinical signs of these parasites are abdominal disorders and diarrhea. Incidentally, nausea and vomiting were observed in all of these infections (11).

The majority of infected restaurant workers were symptomatic, but they had not reported this for unknown personal reasons, and thus, they may be considered as infection carriers.

Infected restaurant workers, with or without clinical signs, are risk factors for public health of a society. Contaminated food plays a major role in the occurrence of diarrhea (12).

In this survey, all restaurant workers with diarrhea had been infected with *Entamoeba histolytica*/dispor and *Giardia*. These two parasites were transmitted to restaurant customers through direct contact. However, however their prevalence rate was decreased from 62.3% to 29% through hand washing by workers (4,13,14).

The aim of this study was to determine the contamination rate of intestinal parasites among restaurant workers who have valid employment certificates (they had been working in restaurants). This will help the authorities to review their laws of employment. Considering the increase in the rate of diseases transmitted through food, it can be concluded that attention has not been paid to the complete health and hygiene of food by hygienic managers and restaurant workers (15).

It is to be known that hygienic measurements concerning restaurant workers, as food handlers, must be considered in the first category of control measurements, and the periodical supplement of health performance must be obligatory for each worker. Most restaurant workers are illiterate or have primary school education and without any attention to hygienic standards transmit parasitic agents to other individuals and this will cause an increase in hygienic and health risks in society (Table 2). It is the responsibility of the Ministry of Health to implement all the hygiene rules in restaurants, and school canteens in every city, in order to minimize the distribution of intestinal parasitic agents.

Conclusion

Food safety education is a critical prerequisite, and health education in general should be increased to raise the awareness of the society about intestinal parasitic problems (16). Therefore, we are in need of constant epidemiological surveillance through periodical surveys and the development of healthcare towards resolving the problem of parasitic infections.

Ethical issues

We have no ethical issues to declare.

Conflict of interests

We declare that we have no conflict of interests.

Table 1. Prevalence of intestinal protozoan parasites in stool examination of restaurant workers

Type of parasites	Number infected	Parasites (%)	Prevalence (%)
<i>Entamoeba histolytica</i> /dispor	34	29	47.22
<i>Entamoeba coli</i>	26	17	36.11
<i>Giardia lamblia</i>	12	8	16.66
Total	72	54	63.88

Table 2. Education levels of restaurant workers

Education level	Number	Percentage
Illiterate	15	15
Primary school	63	63
Secondary school	22	22
Total	100	100

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