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Abstract

Background: Intestinal parasitic infections are among the most common public health problems in populations with poor hygiene. Consequently, mental retardation increases the risk of infection.

Aims: The aim of this study was to investigate the prevalence of intestinal parasitic infections among mentally disabled young people in Hamadan, western Islamic Republic of Iran.

Methods: This descriptive cross-sectional study was conducted on 318 students in 9 special schools in 2017. Triplicate faecal specimens for each student were subjected to stool analysis using direct wet mount, sedimentation concentration, and permanent staining technique. Chi-squared or Fisher's exact test were used for statistical analysis.

Results: Out of 318 students, 135 (42.5%, 95% CI: 37.1–47.9) were infected with intestinal parasites. Prevalence rates for females and males were 45.2% (61/135) and 40.4% (74/183) respectively. Protozoan infections (42.5%, 135) were more numerous than helminthiasis (0.6%, 2). Blastocystis hominis (28%, 89) was the most common parasite, followed by Giardia lamblia (9.7%, 31), Entamoeba coli (9.1%, 29) and Trichomonas hominis (6%, 19).

Conclusions: The high prevalence rate of intestinal protozoan infection reflects poor personal hygiene among the students and inappropriate environmental conditions. Therefore, specific

public health measures are required for the mentally handicapped students in special schools.

Keywords: intestinal parasitic infections, mentally disabled persons, students, prevalence, Iran

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Introduction

Parasite infection still strongly influences the lives of humans. Their major impact is seen in developing countries, and especially in vulnerable groups. It is estimated that 3.5 billion people are affected and 450 million are sick worldwide as a result of intestinal parasitic infections (IPIs) (1). The economic burden is significant: they are responsible for a loss of around 35.4 million disability adjusted life years annually. In addition to gastrointestinal symptoms and digestive disorders, IPIs can cause micronutrient deficiency, mental and physical growth retardation and other serious health problems in children (2–4). Nonpathogenic parasites do not cause sickness and some parasitic pathogens may cause asymptomatic or mildly symptomatic infection in immunocompetent hosts. Therefore, these infections have been overlooked in high-risk groups (5).

Intestinal parasites are transmitted via the faecal–oral route, through unsafe drinking water and food and direct contact with contaminated soil and infected people. Low socioeconomic conditions and poor personal hygiene are believed to be the main epidemiological factors in the spread of IPIs in a society (4,6,7). The high incidence of infections among mentally disabled persons is predictable owing to inadequate personal hygiene. Indeed, IPIs are one of the major problems in the management of rehabilitation centres for mentally disabled persons, and mental disability can be considered another risk factor for intestinal infections, especially for parasitic infections (8).

There have been several reports of IPIs in people with disabilities from different parts of the country (9–13), but to our knowledge, there is little information about the infections in people with disabilities in Hamadan province. Therefore, considering the importance of IPIs in school-aged individuals with disabilities, this study was conducted to evaluate the prevalence of IPIs and their epidemiological associations among the students in special schools in Hamadan.

Methods

Patients and study area

Hamadan, the capital city of Hamadan province, is located in the western region of the country, with a population of over 676 105 and an area of 2831 square kilometres. This city lies at 48°32' E and 34°51' N and at an altitude of 1850 metres. The region has an average annual temperature of 13.4 ºC and average annual precipitation is 308 mm (data from the Statistical Centre of Iran: https://www.amar.org.ir).

This cross-sectional study was conducted in 9 special schools for students with intellectual disability, including primary and high schools, from January to July 2017 in Hamadan. All of the students, 530 individuals, were enrolled in the study.

Ethical considerations

Before the start of the study, informed consent was obtained from the students' parents. This study was approved by the research ethics committee of the Hamadan University of Medical Sciences (Ref. Number: 16.35.1.5168).

Sample collection and examination

Interviews were conducted by trained teachers. Parents answered sociodemographic questions regarding age, sex, parents' education, residence status, and method of washing vegetables. Then, stool specimens were collected every other day (total 3 specimens) because of the intermittent nature of parasite shedding (14). The stool specimens were transferred to the parasitology research laboratory of Hamadan University of Medical Sciences and tested by complete ova and parasite examination (15). After macroscopic examination, the samples were subjected to microscopic examination: direct wet smear (saline and Lugol's iodine preparation), formalin–ethyl acetate concentration, and trichrome permanent stained smear (15). Those students found to be infected were referred to health centres for treatment.

Statistical analysis

Statistical data analysis was performed using SPSS, version 16, and chi-squared ($\chi 2$) or Fisher's exact tests. P-value