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High Prevalence of *Entamoeba histolytica*/*Entamoeba dispar* and *Enterobius vermicularis* Among Elderly and Mentally Retarded Residence in Golabchi Center, Kashan, Iran, 2006-2007

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ABSTRACT

Background: *Entamoeba histolytica*/*Entamoeba dispar* and *Enterobius vermicularis* are the major health problems in the developing countries especially in Iran. The prevalence of infection is variable among different social groups in the world.

Objectives: Since elderly and mentally retarded are high risk group, the present survey was carried out in order to determine the prevalence of intestinal parasites especially these parasites in elderly and mentally retarded residence in Golabchi Center, Kashan, Iran.

Materials and Methods: In this Cross-sectional study a total of 243 stool samples and 279 Scotch tapes from elderly and mentally retarded people were collected. Intestinal parasitic infections especially *E.histolytica*/*E.dispar* was determined by Stool examination. Scotch tape was used for diagnosis of *Enterobius vermicularis*. The demographic data were recorded by questionnaire and were analyzed by SPSS and X².

Results: The overall infection rate of intestinal parasite was 78.7% (191 out of 243 subjects). The prevalence of *E.histolytica*/*E.dispar* and *E.vermicularis* in elderly were 16.8%, 25.5% and in mentally retarded 15%, 49.1% respectively. Prevalence of pathogenic parasites was: *Taenia spp.* 1.6%, *Hymenolepis nana* 0.8%, one case of *Strongyloides stercoralis*, *Blastocystis hominis* 33.3%, *Giardia lamblia* 4.5%, *Dientamoeba fragilis* 1.6%. The rate of infection in mentally retarded was higher than elderly ($P < 0.001$). The prevalence of *E.vermicularis* in the male was 2.5 times more than female ($P < 0.001$). There was significant relation between annual itching and nail chewing and Enterobiasis ($P < 0.05$).

Conclusions: This study showed that infection with intestinal parasites especially *E.histolytica*/*E.dispar* and *E.vermicularis* was higher than expected in elderly and mentally retarded. Due to importance of these parasites and some risk factors such as population density and an immunosuppressive background in elderly, health education and mass medication for control of disease is emphasized.

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► Implication for health policy/practice/research/medical education:

The results of this study showed high prevalence of pathogenic intestinal parasitic infection in the center, due to its spread to family members of infected persons, parasite control strategies are recommended.

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1. Background

Intestinal parasitic infection is highly prevalent throughout the developing countries of the world. High prevalence of parasitic infection is because of poverty, elderly, malnutrition, illiteracy, population density, lack of health equipment that it can be led to financial cost. Annually, 16 million deaths occurs due to the parasitic disease in the world (1, 2). Amoebiasis is caused by the protozoan *Entamoeba histolytica* worldwide, approximately, 40 to 50 million people develop colitis or extra intestinal disease annually, up to 40000-110000 deaths (2, 3). Amoebiasis has been the cause of death in elderly at general hospital of Mexico in 60 century (4). *E. histolytica* caused intestinal infection, but extra intestinal amoebiasis such as liver abscess, thoracic, genital amoebiasis, acute appendicitis and brain abscess have also been reported (2, 5-8).

Enterobius vermicularis is one of the most common intestinal parasites found in humans (1, 2). Extra intestinal migration of worms, may lead to severe health disorders or even death (1, 2, 9). Appendicitis, vulvoginitis, endometritis, ear, eye and kidney problems caused of *E. vermicularis* have been reported (1, 2, 9-11). Autoinfection and re-infection of *E. vermicularis* is common, especially in population dense areas and instituted (2). The prevalence of intestinal parasites has been reported variable among different groups of people. In Kashan, Iran, about 50% to 70% (12). The prevalence of *E. histolytica/E. dispar* among the elderly and mentally retarded persons in the world has been reported 19.7% and 1.1-38% respectively (13-15). According to a statistical report in Iran in 1997 at least 6.6% of population up to 60 years are geriatric and it is estimated that it is rising to 10 million persons until 2011 (16). The first step to achieve health of elderly and mentally retarded people is based on the identification of parasitic infection and then, proper treatment and health education for prevention of re-infection.

2. Objectives

Since parasitic disease is one of the major health problems among the elderly and mentally retarded people and little is known about the prevalence of parasitic infection in these groups, this study was carried out in Kashan, Iran.

3. Materials and Methods

In this Cross-sectional study via census method, a total of 243 stool samples, (155 from elderly and 88 from mentally retarded people) and 279 Scotch tapes (165 from elderly and 114 from mentally retarded people), all inhabitant of Golabchi Geriatric Center of Kashan and

54 from official personnel were collected during 2006-2007. Personal data such as age, sex, population density and sings of disease were recorded in questionnaires. Stool samples were sent to the parasitology laboratory of Kashan University of Medical Sciences. Stool samples were examined by three methods; including wet smear, lugol's staining and formalin - ether concentration. Diagnosis of intestinal parasites is confirmed by the recovery of protozoan trophozoites and cysts, eggs and larvae of helminthes. Scotch tape method was used for diagnosis of *E. vermicularis* (1). The results were recorded in data forms and were analyzed by SPSS software and X2. This study has been approved by Ethic Committee of Kashan University of Medical Sciences.

4. Results

Out of 243 samples, 121 elderly (78.1 %) and 71 mentally retarded persons (80.7 %) were positive for at least one intestinal parasite. The prevalence of pathogenic parasites in elderly and mentally retarded ones has been presented in Figure. The rate of pathogenic parasites among mentally retarded was higher than the elderly ($P < 0.001$). The prevalence of *E. histolytica/E. dispar* among elderly was higher than mentally retarded ($P > 0.05$) (Table 1). The prevalence of other pathogenic protozoa among elderly and mentally retarded people was: *Blastocystis hominis* 81 (33.3%), *Giardia lamblia* 11 (4.5%), *Dientamoeba fragilis* 4 (1.6%). The prevalence of nonpathogenic protozoa was: *Entamoeba coli* 49.4%, *Chilomastix mesnili* 23.5%, *Entamoeba hartmanni* 23.9%, *Endolimax nana* 11.5%, *Iodamoeba butschlii* 6.6% respectively. Distribution of *E. histolytica/E.*

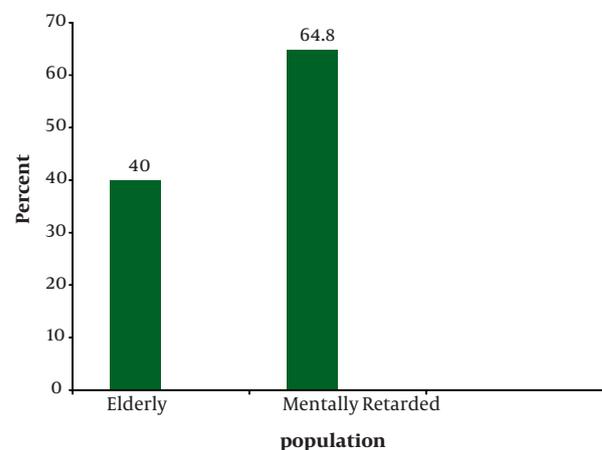


Figure. Distribution of Pathogenic Intestinal Parasites among Elderly and Mentally Retarded People at Geriatric Center in Kashan, Iran, 2006-2007

Table 1. Prevalence of *E. histolytica/E. dispar* and *E. vermicularis* Between Elderly and Mentally Retarded Persons at Geriatric Center in Kashan, Iran

	Examined, No.		Infected, No. (%)		Statistical Analysis
	Elderly	Mentally Retarded	Elderly	Mentally Retarded	
<i>E. histolytica/E. dispar</i>	155	88	26 (16.8)	14 (15.9)	$P > 0.05$
<i>E. vermicularis</i>	165	114	42 (25.5)	56 (49.1)	$P < 0.001$

Table 2. Prevalence of *E. histolytica/E. dispar* by to Sex and Age Among Elderly and Mentally Retarded Persons at Geriatric Center in Kashan, Iran

	Examined, No.	Prevalence Rate, No. (%)	P value
Sex			
Male	111	22 (19.8)	$P > 0.05$
Female	132	18 (13.6)	
Age Group, y			
15-39	78	13 (16.7)	$P > 0.05$
40-59	78	14 (17.9)	
60-79	52	8 (15.4)	
80-110	35	5 (14.30)	
Total	243	40 (16.5)	

dispar according to the sex and age has been presented in Table 2. The prevalence of this parasite among men was higher than women, and among more than 60 years old was lower than the younger, but the difference was non-significant ($P > 0.05$). Majority of infected people were asymptomatic (73.9%) and 15.7% had diarrhea. The highest clinical signs of *E. histolytica/E. dispar* were constipation 23%, abdominal pain 20%, anorexia 17.9%, weight loss 15%, and the lowest was nausea 5%.

The rate of helminthic infections by formalin ether method were: *Taenia spp.* 1.6%, *Hymenolepis nana* 0.8% and *E. vermicularis* 1.6%. Rhabditoid larva of *Strongyloides stercoralis* was observed in an 18 years old woman with the mentally retardation, that immediately treated with Tiabendazole. The overall prevalence of *E. vermicularis* by Scotch tape was 35.1%, and among elderly and mentally retarded people were 25.5% and 49.1% respectively ($P < 0.001$). Frequency distribution of *E. vermicularis* according to the sex and age has been presented in (Table 3). The prevalence of *E. vermicularis* among men was higher than women and in lower than 60 years old group, was higher than elderlies respectively ($P < 0.001$, $P < 0.05$). There was significant relation between annual itching and teeth chewing and *E. vermicularis* infection ($P < 0.05$). The prevalence of intestinal parasites in official people was 46.3% and no pathogenic protozoan was seen. Prevalence of *E. vermicularis* was 8.5%. From 131 infected people, 41 (31.3%) infected to one parasite, 26 (19.8%) two parasites, 34 (26%) three parasites and 30 (22.9%) with up to four parasites.

5. Discussion

Parasitic infections especially Amoebiasis remain an important cause of morbidity and mortality in developing countries (2). Our study assessed the high prevalence of intestinal parasites especially *E. histolytica/E. dispar* and *E. vermicularis* infections in an under-studied population group in Kashan, Iran. It is important to note that in this study, the prevalence of intestinal parasites among mentally retarded was 80%, which is outside the range of 26.2% and 55.9% among the students of rehabilitation center of Mazandaran and Esfahan, Iran (17, 18) and other countries such as; handicappeds in Korea 35.7% (19). However, other investigators reported a prevalence of 50.8% of intestinal parasites among the elderlies in Nepal (15) and 7.3% among mentally retarded people in the U.S.A respectively (20).

The comparison of the results of intestinal parasites especially *E. vermicularis* and *E. histolytica/E. dispar* between investigations was performed in other countries and the present study clearly showed that, intestinal parasites are the major problem in population study and probably related to the life style and sanitary management.

The prevalence of *E. histolytica/E. dispar* was 16.8% among elderlies and 15.9% among mentally retarded people. The results of investigations in Asian countries showed that the prevalence of *E. histolytica/E. dispar* among handicappeds was 1.8% in Korea (19), in Taiwan 1.1% (13) and in Wayampi Indians from French Guiana 17% (21). 38% of

Table 3. Prevalence of *E. vermicularis* by Sex and Age Among Elderly and Mentally Retarded Persons at Geriatric Center in Kashan, Iran

	Examined, No.	Prevalence Rate, No. (%)	P value
Sex			
Male	141	69 (48.9)	$P < 0.001$
Female	138	29 (21.1)	
Age Group, y			
15-39	104	55 (52.9)	$P < 0.05$
40-59	79	25 (31.6)	
60-79	56	15 (26.8)	
80-110	40	3 (7.5)	
Total	279	98 (35.1)	

mentally disabled individuals at rehabilitation institutions in Philippines and Japan (14, 22) and 19.7 % of elderlies in Nepal were positive for *E.histolytica/E.dispar* (15). The prevalence of *E.histolytica/E.dispar* was 33.7% in mentally retarded people in Italy (23). The prevalence of *E.histolytica/E.dispar* in our study was almost similar to that found in French Guiana and Nepal (15, 21), but was higher than the reports from Asia and the U.S.A (13, 19, 20) and lower than what reported in Philippines, Japan, Italy (14, 22, 23). The prevalence of *E.vermicularis* in our study was twice to that found in Korea 20.6% [19], but was very higher than reported in the U.S.A 4.5% (20). The reasons of high prevalence of *E.histolytica/E.dispar* and *E.vermicularis* in geriatric and especially mentally retarded were malnutrition, illiteracy, population density (10 person/room), insufficiency of health equipment and poor sanitary, consumption of untreated water, an immunosuppressive background and simple life cycle, oral-fecal and direct transmitted disease (1, 2, 22). The Prevalence of *E.vermicularis* in 15-39 years old was higher than the others ($P < 0.001$). This age group was mentally retarded; due to the poor sanitation, the rate of infection was high. It is consistent with findings of other studies (19, 24). Gender significantly affected the prevalence of intestinal parasitic infections. The rate of *E.vermicularis* in men was 2.5 times than women ($P < 0.0001$). According finding of Lee *et al.* 25.7% of males and 9.6 % of females among handicappeds instituted had been infected with *E.vermicularis* (19), this is in support of our findings. Majority of infected people with *E.histolytica/E.dispar* was asymptomatic (carrier) and can transmitted disease to others (1, 2). Annual itching and teeth chewing are more prevalent in Enterobiasis ($P < 0.005$). This symptoms and behaviors are pathogonomic and can guide for diagnosis of the disease (1, 2). The high prevalence of infection among personnel is referring to the direct contact to inhabitants of this center and lack of knowledge of transmission of diseases. In total, this study showed that intestinal parasitic infections especially *E.histolytica/E.dispar* and *E.vermicularis* were high in geriatric and mentally retarded of Kashan Golabchi Center, that represents the lack of personal hygiene. Due to serious complications of these diseases and its spread to the family members of the infected persons, treatment and prevention measurement are necessary for solving the problem (1, 2, 25). High prevalence of pathogenic parasites; *E.histolytica/E.dispar* and *E.vermicularis* in the study population must be considered as a major public health problem, therefore planning future research and parasite control strategies especially mass treatment and health education are recommended.

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