

The prevalence of *Trichomonas tenax* and *Entamoeba gingivalis* in mental disabilities children at Ahvaz welfare centers, Iran, in 2016

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ABSTRACT

Entamoeba gingivalis and *Trichomonas tenax* are the most common oral cavity protozoans that may cause periodontitis and gingivitis. The aim of this research was to compare the frequency of these two oral cavity protozoans in children with mental disabilities, kept in welfare centers of Ahvaz, Iran, in 2016. In this cross-sectional study, samples were collected from the mouth of 118 children, kept in welfare centers of Ahvaz, using sterile swabs and a questionnaire was filled for each child. The samples were placed in sterile normal saline and on slides, were sent to a laboratory for further examination. The samples were then examined with wet-mount, Giemsa, and Trichrome staining methods. Out of 118 cases, 68 (57%) were male and 50 (43%) were female. All of the cases were in the 6-14 age range. 38 (32.2%) had gingivitis and 80 (67.8%) didn't. 6 (15.7%) of those who had gingivitis, were infected with one of the aforementioned protozoans; four cases (66%) with *Entamoeba gingivalis* and two cases (34%) with *Trichomonas tenax*. No case of infection with these parasites was detected among those who didn't have gingivitis. The results of this study indicated that all the cases infected with these parasites, were among those who had gingivitis. Therefore, gingivitis can be an influential factor in the survival of these parasites.

Keywords: Ahvaz, *Entamoeba gingivalis*, gingivitis, mental disabilities, *Trichomonas tenax*.

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Introduction

Gingivitis or the inflammation of the gum tissue happens when dental plaque forms along the gum line and causes irritation, redness, inflammation and sometimes bleeding. Gingivitis is among the common oral and dental diseases and is usually caused by microorganisms such as bacteria, viruses, fungi, parasites and their secretions (1).

The commonest parasite causing gingivitis is *Trichomonas tenax*, the quantity of which increases in this disease. The probability of the presence of this parasite in the oral cavity of those with gingivitis or periodontitis fluctuates between 4% and 53% (2).

Entamoeba gingivalis is another oral cavity protozoan which can be found in interdental

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spaces, abscessed gum or tonsil grooves. The quantity of this amoeba multiplies in patients with tooth decay, inflammation of the dental pulp and oral necrotic diseases (3). The probability of the presence of this parasite in the oral cavity of those with gingivitis or periodontitis fluctuates between 17% and 94% (4).

Examining oral hygiene in mentally-handicapped people is of great importance because unlike ordinary people, they cannot spot their own oral diseases except in the advanced stages (5). For many years, researches have been conducted on the oral hygiene of people with various handicaps, their comparison with healthy people in this regard and detection of the causes of the differences between these two groups for the purpose of making plans to reduce the problems (6-10).

Considering the fact that no precise information was available about the frequency of *Trichomonas tenax* and *Entamoeba gingivalis* in mentally-handicapped children kept in welfare centers of Ahvaz, Iran, the present research was planned and conducted in order to determine the frequency of these two protozoans in this group of people.

Material and Methods

A total of 118 learning-disabled children kept in welfare centers of Ahvaz, from May to December 2016 were included in the study. At first a questionnaire, containing personal information, was filled for each child.

All the cases were first clinically examined by dental specialists to find out whether they had periodontal diseases or not. Then, samples of saliva and dental plaque were collected using sterile swabs and forceps. Three samples were collected

from each child and taken immediately to the laboratory of the Infectious and Tropical Diseases Research Center, of Ahvaz Jundishapur University of Medical Sciences, for examination. The first group of samples was placed in sterile normal saline and was examined with the wet-mount method; they were observed under a microscope to find out about the movement of the protozoans. The second group of samples was examined with Giemsa and Trichrome staining methods; they were observed under a microscope with 100x immersion oil lens. The third group of samples was cultured in Dorset medium, kept in an incubator with a temperature of 35 degrees centigrade, and examined under a microscope after 72 hours.

Results

Out of 118 cases, 68 (57%) were male and 50 (43%) were female. All of the cases were in the 6-14 age range. 38 (32.2%) had gingivitis and 80 (67.8%) didn't. Out of 118 cases, 6 (5%) were infected with one of the aforementioned parasites; 4 cases with *Entamoeba gingivalis* and 2 cases with *Trichomonas tenax*. Out of the 4 cases infected with *Entamoeba gingivalis*, 3 (75%) were male and 1 (25%) was female while the 2 cases (100%) infected with *Trichomonas tenax* were both male. 39.5% of the cases who had gingivitis and 50% of the cases infected with these parasites were in the 8-10 age range, showing the highest frequency. Furthermore, all of the cases infected with these parasites (100%), also had gingivitis. It's noteworthy that all those infected with one of these parasites showed high levels of learning difficulties and didn't brush their teeth. No case of infection with these parasites was detected among those who didn't have gingivitis (Table 1 and 2).

Table 1. Comparison of gingivitis index, positive infection to *E. gingivalis* and *T. tenax* between male and female.

	Sex	Examined individual	Gingivitis index		Parasitic infections	
			Positive	Negative	Positive for <i>Entamoeba gingivalis</i>	Positive for <i>Trichomonas tenax</i>
Study group	male	68	23	45	3	2
	female	50	15	35	1	0
	total	118	38	80	4	2

Table 2. Comparison of gingivitis index, positive infection to *E. gingivalis* and *T. tenax* between age groups

	Age group	Examined individual	Gingivitis index		Parasitic infections	
			Positive	Negative	Positive for <i>Entamoeba gingivalis</i>	Positive for <i>Trichomonas tenax</i>
Study group	6-8	23	8	15	0	1
	8-10	43	11	32	2	1
	10-12	25	9	16	1	0
	12-14	27	10	17	1	0
	total	118	38	80	4	2

Discussion and Results

According to the obtained results, only 5% of the cases under examination showed infection with one of these parasites, whereas Daqiq-Afkar et al. (2008) reported 18% infection with these protozoans in Shiraz (11). Based on the results of another research conducted by Kashefi-Mehr et al. (2014) on patients with Down syndrome in Tabriz, 18.8% of those who had periodontitis and 3% of the control group were infected with *Trichomonas tenax* (12). Still, in another research, Gharavi et al. reported 41.7% infection with *Entamoeba gingivalis* and 9.2% with *Trichomonas tenax* (13), showing a higher frequency in comparison with the results of the present research. However, in another research conducted by Maraghi et al. (2009) on 200 patients with gingivitis and periodontitis in Ahvaz, only one case of infection with *Entamoeba gingivalis* was found (14), showing a lower frequency in comparison with the results of the present research. The differences between the results of these researches (the frequencies of the parasites) may be due to the fact that they were conducted in different cities with different climatic conditions, or the cases under examination were different and in different age ranges.

Based on the results obtained from the present research, there was a meaningful relation between the frequency of infection with the aforementioned protozoans and the age of the cases under examination; the children in 8-10 age range had the highest frequency in regard to infection with gingivitis (28.9%) and the parasites (50%). However, Gharavi et al reported patients in

the 21-30 age range (13) and Kurnatowska reported patients in the 23-50 age range as the most frequent in this regard (15), in Iran and Poland respectively. Therefore, the results of the present study did not accord with the results obtained from previous researches.

The results of the present research showed a meaningful relation between sex and the probability of infection with the aforementioned protozoans; all the cases (100%) infected with *Trichomonas tenax* and 75% of the cases infected with *Entamoeba gingivalis* were male. Similar results were obtained in the research conducted by Gharavi et al. and a meaningful relation was found between the patients' sex and the probability of infection with these protozoans; the probability was proved to be higher in males (13). However, in another similar research conducted by Athari et al in Tehran, no meaningful relation was found between sex and the probability of infection with these protozoans (16).

Based on the results of this research, all of the cases infected with one of these protozoans were among those suffering from gingivitis (15.7% of those who had gingivitis, were also infected with one of these protozoans). According to the results of the researches done by Athari et al in Tehran (16), Kashefi-Mehr et al. in Tabriz (12), and Daqiq-Afkar in Shiraz (11), respectively 20.6%, 18.8% and 18% of the patients who had gingivitis or periodontitis, were also infected with one of these oral cavity protozoans; however, respectively 1.9%, 3% and 2% of the control groups in these researches were infected with these protozoans. Therefore, the results of these researches accord

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with the results of the present research in this regard. The results of this research also indicated that there is a direct relation between the degree of patients' learning difficulties and the level of their oral and dental hygiene; those with higher degrees of learning difficulties were proved to have lower levels of oral and dental hygiene and to be more susceptible to gingivitis.

Conclusion

The higher frequency of these parasites in those who have gingivitis or periodontitis in comparison with those who do not, underlines the point that gum diseases such as gingivitis can provide a suitable condition for the survival of these parasites.

Therefore, it is hoped that this research can be a step forward in raising these children's families' and welfare centers' officials' awareness of the importance of improving the level of these children's oral and dental hygiene and can help them in this regard.

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Conflict of Interests

Authors have no conflict of interests.

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