Evaluation of the prevalence of oral parasites and some variables affecting them among students of Al-Furat Al-Awsat Technical University

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Abstract

The present study was conducted for the period from September 2024 to March 2025 to investigate the infection of oral parasites Trichomonas tenax and Entamoeba gingivalis among students of the Al-Furat Al-Awsat Technical University in Kufa.

The number of samples examined 150 saliva samples and gum swabs were collected from the students of the Technical Institute Kufa and the Medical Technical College Kufa; the samples were examined by direct smear and the preparation of wet slides in the laboratories of the Pathological Analysis Department in the Technical Institute Kufa. The prevalence of the E. gingivalis parasite was 10%, and the T. tenax parasite was 18%. The infection rate was higher in males, reaching 20%, than in females, which reached 8%. The incidence rate among students living in rural areas is 60.4%, while 39.6% of infected students are urban residents.

Key word: oral parasite, university students in Kufa.

INTRODUCTION

The parasite *T. tenax* is found in the oral cavity of humans and is anaerobic. It is most common among people with an unhealthy oral environment and people with dental and gum disease [1]. The parasite is usually transmitted by kissing and flying mist or using contaminated food and toothbrushes or through drinking. The parasite is resistant to temperature changes and can survive in drinking water from hours to many days [2].

The polycystic phase is not present in the life cycle of this parasite, so reproduction is carried out by the cellular division of the active phase [3]. The nucleus is divided into 2–8 nuclei, followed by cytoplasmic division, and eventually the parasite becomes 2–8 individuals [4] .The oral cavity of humans is home to many microorganisms and has a number of characteristics that make it a unique microbiological environment [5, 6]. *E. gingivalis* is a parasite that exists in the pits of teeth and tissue gums, causing suppuration and digging tonsillitis. Many studies suggest that there is a relationship between its presence and periodontitis infections [7]. E. gingivalis belongs to the Entamoebaidae family and the Sarcodina Division [8].

Some researchers have noted that this parasite is opportunistic because it is present in the oral cavity of healthy people but has the ability to reproduce in the oral environment with periodontal disease [9]. Noted the researcher [10] in his study that the infection parasites of oral are common among people with infections, gum Periodontal disease, the parasite transmission from one person to another by kissing, spray mist and saliva, or in combination with tools eating, and 95% of individuals with unhealthy mouth infected have *E. coli, E. gingivalis* [11].

Due to the large number of reviewers who complain of infection of teeth, gums and tonsils to hospitals, health centers and private clinics on the one hand and due to the lack of studies concerning the infection of these parasites *T. tenax* and *E. gingivalis* and If any, they are very few, so the aim of this study was to determine the incidence of the above parasites among young people represented by the students of the Technical Institute and the Technical College in Kufa and the extent of the incidence of sex.

Materials and methods

During the period from September 2024 to March 2025, 150 samples of saliva and sputum from both sexes were collected from students of Al-Furat Al-Awsat Technical University in Kufa using an information form containing the patient's name, sex, and area of residence in an attempt to study the epidemiology of oral parasites E. gingivalis and T. tenax among students of Al-Furat Al-Awsat Technical University in Kufa.

Methods of examination:

A- Microscopic examination: It is divided into- :

1-Direct Smear Method

Samples are taken from the mouth and then fixed on the glass slide and then examined under a light microscope under the forces of minor and major (X10, X40, X100), under which we can observe the movement of spiral parasites, which is one of the characteristics of the parasites, which we can distinguish from the other [12].

2-Wet Preparation Method

Put the submerged saliva sample taken from the student's mouth on a clean glass slide and sterilize and mix well with saliva, and then place the cover of the slide on it and examine under the major powers of the microscope magnification force X400 to detect the parasites of *E. gingivalis* and *T. tenax.* In wet specimens, the *T. tenax* parasite is a moving wave, and the anterior tuft of the capillaries and the lateral membrane ripple can be distinguished. If the characteristics of the parasite are present in the sample, the result is positive in terms of size, shape, nucleus shape, and number of hairs [13].

3-Staining method

This method was done by taking a swab from the mouth and putting the swab on a glass slide, then fixing it by flame, and then putting a type of dye, such as Giemsa stain, on it. This dye works on discrimination.The flagella and cytoplasm of the parasite were then washed with distilled water to dilute the dye and then examined under a microscope. There are many dyes used, including Giemsa staining, methylene blue, and Gram stain [14].

Statistical analysis

Statistical analysis was carried out using chi-square under a significant level (0.05) [15].

Results

1. Parasite infection rate, *Entamoeba gingivalis* and *Trichomonas tenax*:

The results of the present study showed that the total infection rate was 28% for both parasites, The infection of *Trichomonas tenax*, was 18% while the infection rate of *Entamoeba gingivalis* was10% as in Table (1) and Figure (1).

Table 1: Parasitic infection rates, *Entamoeba gingivalis*, *Trichomonas tenax*

Parasite Type	Number of Infected	Percentage
Entamoeba gingivalis	**15**	**10%**
Trichomonas tenax	**27**	**18%**
Total	**42**	**%28**

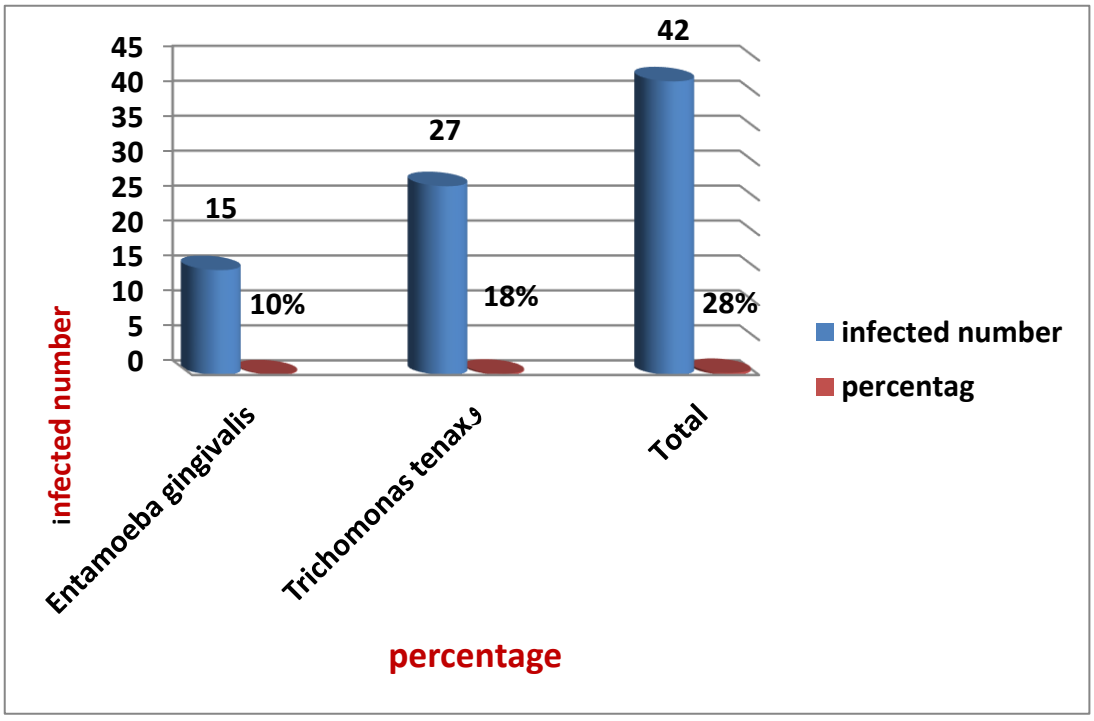

Figure (1): Parasitic infection rates, *Entamoeba gingivalis*, *Trichomonas tenax*

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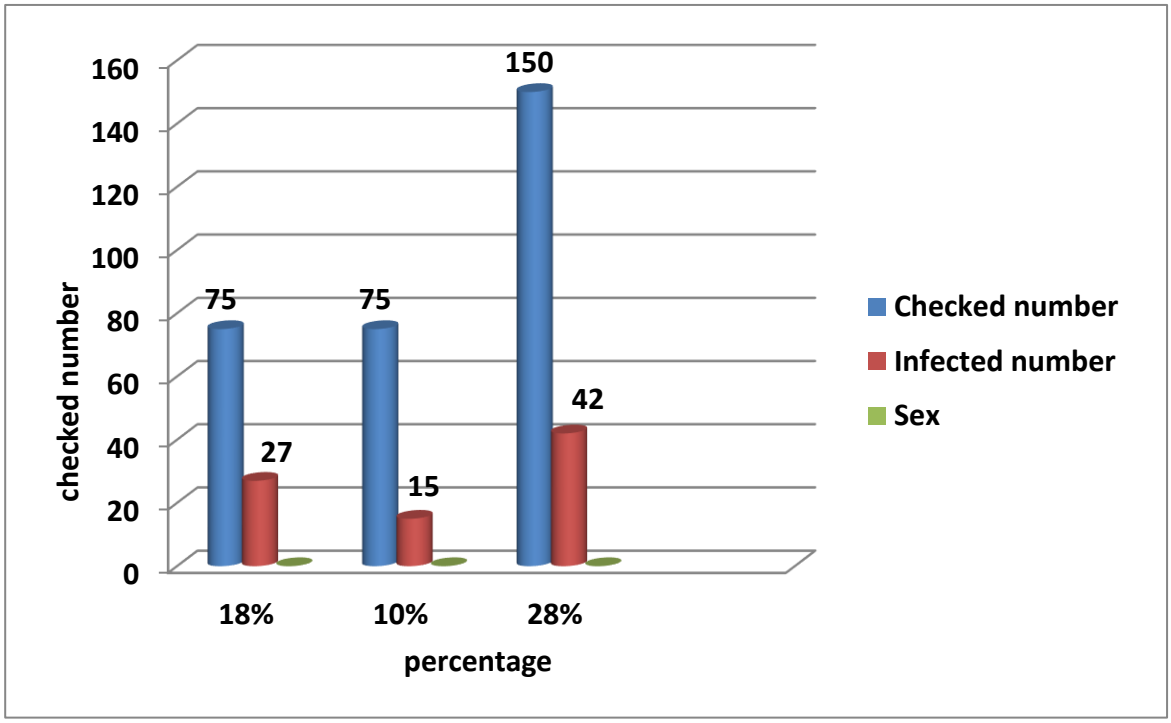
2. The relationship between infection rate and sex of the infected:

The results of the current study show the high proportion of males with mouth infection parasites as 18% compared with females' infection, which accounted for 10% of the total proportion of the infection (Table 2) and Figure (2).

Table (2): The relationship between the incidence of parasites of the mouth and the sex of the patient.

Sex	Infected number	Checked number	Percentage
Male	27	75	%18
Female	15	75	%10
Total	42	150	%28



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3 – The relationship between the proportion of infection and housing area of the infected:

The results of the study showed that there were significant differences in the incidence rates among the infected students according to their areas of residence. The incidence rate was high among students with rural incidence, where it was 59.6%, compared with the proportion of injury among students living in cities, where it was 40.4%, as shown in Table (3) and Figure (3).

Table (3): The relationship between infection rate and housing area for the infected.

Housing Area	Number of Infected	Number of Examiners	Percentage
Rural	25	75	% 59.6
Town	17	75	% 40.4
Total	42	150	%100

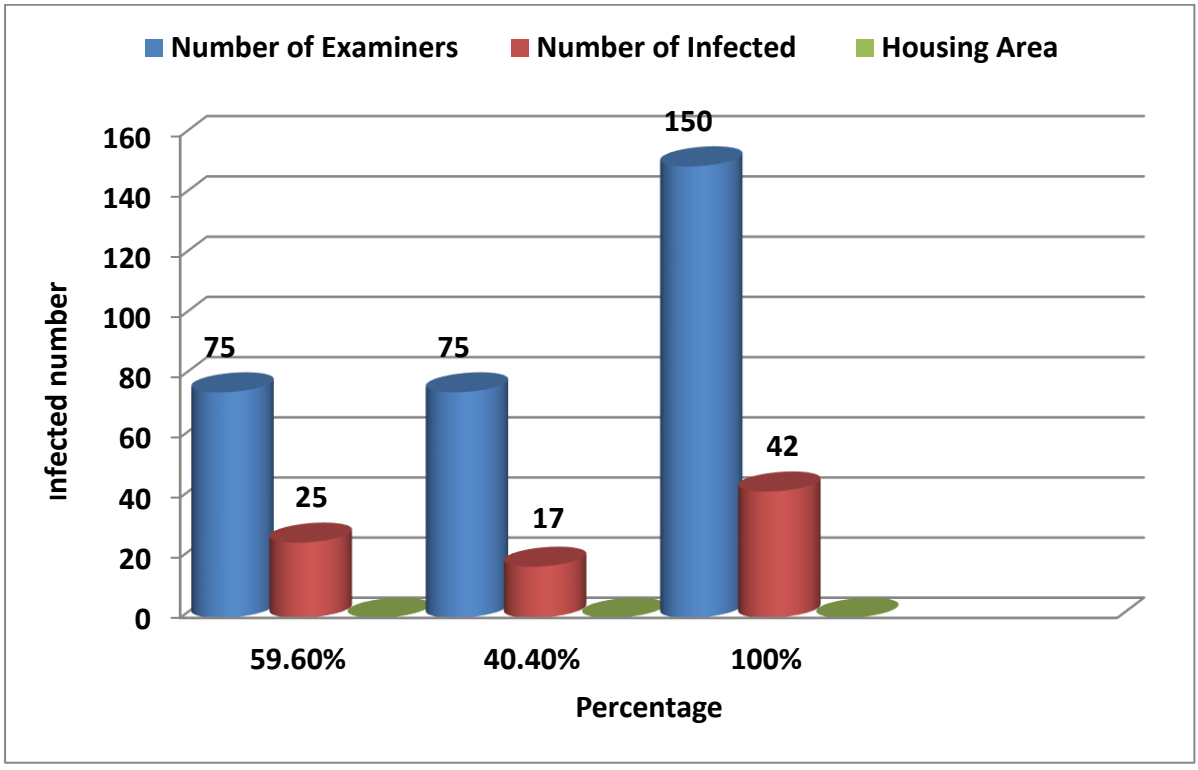

Figure (3): The relationship between infection rate and housing area for the infected.

Discussion

The presence of oral parasites E. gingivalis and T. tenax in the oral cavity is a sign of a lack of attention to oral hygiene, dental care, and gum disease, and the method of spreading is similar in both parasites through kissing and volatile spray or the common use of eating and drinking tools [16] .Previously, people believed these parasites had no obvious pathological symptoms, but recent studies confirm that the presence of these parasites is associated with a poor oral environment as well as supportive tissue disease and gum bleeding [17].

The results of this study showed that the total infection rate of oral parasites was 28%, distributed to 10% for E. gingivalis and 18% for T. tenax. These rates are comparable to several studies [18, 19], which recorded ratios ranging from 12% to 32%.

The results were not identical to the study [20], which recorded an infection rate of 4.9% for T. tenax and 11.3% for E. gingivalis, and [21], which had an infection rate of 41.7% for E. gingivalis and 9.2% for T. tenax, as well as a study [22] in which the infection rate of E. gingivalis was 31.37%, higher than 22.53% for T. tenax, and in a study [23] the prevalence of E. gingivalis was 10%, while T. tenax was 2%.The reason is due to neglect of oral hygiene and teeth and its impact on many diseases, including oral infection of parasites. It is mentioned that there is increasing lack of hygiene and vice versa, but excessive hygiene has a negative impact on many diseases due to lack of immunity because of the inefficiency of the immune system and the lack of exposure to such parasites previously [24].

The results of the present study showed that there is a relationship and influence of the sex factor in the incidence of both parasites, where the total infection rate in males was 18%, which is higher than the infection rate in females recorded at 10%, and the total infection rate for females was 7.63% for T. tenax, less than the total For males, 8.07%; these results were consistent with several studies, including [25], which found that the prevalence of E. gingivalis in females is lower, probably due to more dental care in females than in males, and the study of [26] found that infection with E. gingivalis is more prevalent in males, and the lower infection rate in females is attributed to being more concerned with oral health than males.

This is identical to the results of the current study and may be the reason for this decrease in the infection rate of both parasites in females due to health awareness and much care of the

mouth and teeth as a cleaner and elegance and the availability of the factor of time and comfort and presence in the home when compared to males. On the other hand, the reason may be attributed to it considering itself sex. Gentle, therefore, take care of her oral hygiene more than males, and also, high immunity in women against the incidence of many diseases is more than in men.

If we take this study from another perspective, we find it different and far from the results of many studies, and this characteristic is contained in the results of scientific research, where the reason for this is due to the time, conditions, and samples of research taken with the nature and level of social, cultural, and economic factors of society, including the study of [26], which reached The sex factor was not significant in the infection rate of both parasites, and the differences in infection rate between males and females were not statistically significant in all studied cases.

In this study, data were collected from the students, taking into account the environmental degradation of these students and the extent of its impact on the incidence of oral parasites *E. gingivalis* and *T. tenax*, where it was found that the overall incidence of oral parasites among students with rural environmental decline was the highest at 60.4% of the rates of injury among students from the city's residents and from various Iraqi provinces, which recorded 39.6%.

These ratios are comparable to several studies [10, 20, 21]. Perhaps the reason for the lower rate of infection in the city center than in the villages is the increased health awareness of people and their knowledge of the importance of oral hygiene and dental health and gum health, the quality of water used, and the lack of these in the villages and the impact of educational level on the infection rate of parasites in the study. In other words, there is an inverse relationship between educational level and infection rates; they are high among non-educated people.

This is attributed to the cultural and scientific awareness and the correct health guidance followed in the advanced stages of the study and to the recognition of the importance of oral care and teeth and serious consideration of oral diseases spread among persons, while we note the opposite in people from the initial stages of education and the type of work they do and the lack of adequate health guidance to them. And oral hygiene and bad habits led to the infection and spread of oral parasites, and this was evident in the results of our study.

The decrease in the infection rate of oral parasites in this study is attributed to the cultural and scientific awareness and the correct health guidance followed in the advanced stages of study

(university) and to the recognition of the importance of oral care and teeth and the serious consideration of the prevalence of oral diseases among people, while we note the opposite in people in the early stages of education and lack of access to adequate health guidance about oral hygiene and bad habits led to the infection and spread of oral parasites, and this was evident in the results of our study.

This may also be attributed to the critical conditions that Iraqi society has been going through, such as the deterioration of health services, the lack of medicines, and the high cost and lack of availability in health centers and hospitals, especially those related to dental centers. Therefore, it is difficult for people with low living standards to consult private dentist clinics because of the high cost. Therefore, these conditions combined led to an increase in the infection rate of oral parasites, which led to the deterioration of their health, while the low infection in people with a high level of living is due to the availability of good conditions that enable them to visit private clinics with high health care, which is rarely available in some centers of Health and Hospitals.

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