Prevalence *trichomonas tenax* in Karbala Governorate

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**Abstract.** This study included the sampling (383) of the mouth of the people who visited the specialized dental centers and some of the health centers in the holy province of Karbala (the specialized center of dentistry in Al-Hur, the health center in Al-Iskan, the health center in al-Ghadeer district, the health center in Abbasiyah) Saliva, gingivitis, gingival and gingival pockets with the assistance of the specialist doctor. The number of samples examined was 383 samples for the period from 1-9-2017 to 1-5-2018. In this study, participants in the study included both smokers and diabetics. In this study, a questionnaire was used to collect the evidence of the reviewers and included a questionnaire for the treatment of patients with oral diseases such as bleeding gums, damage to the supporting tissue, acute gingivitis and gingival sinuses. Patient name, age, gender, educational level, marital status, and illness The results showed that the incidence of parasites *Trichomonas tenax* in the holy province of Karbala 8.09% and the highest rate of infection in the month of 2018, where the proportion of infection was 13.33%, while the lowest rate of infection in September and October 2017 was 0%. The study showed that the percentage of infection of *T.enax* parasites in females is higher than the percentage of infection in males as the percentage of female infection was 11.01% overall, while the percentage of male infection was 6.79%. The study showed that smokers had the highest rate of infection compared to nonsmokers, with 15.7% of smokers and 4.58% of non-smokers. The incidence of parasitic infection among people with diabetes was higher than that of non-smokers, with 12.97 For people with the disease, and 5.55% for people without the disease. The study found that the incidence of *T.tenax* parasites in people with oral disease was greater than that of non-oral patients. The incidence of parasitic infection was 12.58% in individuals with oral diseases, while in individuals without the disease was 5.17%. The proportion of parasitic infection of people with gum disease is the highest proportion of oral diseases, the proportion of 20.83%, and was the lowest rate of infection is 9.09% for people with gum disease bleeding. The study found that the incidence of parasite infection in married persons was 8.59%, while the percentage of infection in unmarried persons was 7.40%. The study showed that the highest incidence of *T.tenax* was among those with secondary education, which reached 12.41%, and the lowest proportion of people who received And the highest percentage of parasitic infection was in the age group (56- and above), with a rate of infection of 2.56%.

**Keyword:** Trichomonas, oral diseases, smoking, Diabetes

1. Introduction

*Trichomonas tenax*, is of world-wide distribution in man and monkeys and noted in older works as *Trichomonas buccalis* and *Trichomonas elongate* (1). *T. tenax* was first discovered by Muller in 1773 in an liquid culture of tartar from teeth (2). *T. tenax* could be a pear-shaped, flagellate
protozoan with an undulating membrane (3). It is ordinarily individual harmless common-sally of the human mouth living in tartar around teeth and in carious cavities, in addition as in nasopharyngeal region (4,5).

*T. tenax* feeds on microorganisms in its surroundings, infection unfold rough secretion, drop spray and kissing, or on contaminated dishes, glasses and hands or mistreatment contaminated toothbrushes and drinking water (6).

Several studies disclosed that *T. tenax* has been isolated from samples of dental calculi and sub-gingival plaques of patients with odontology issues chiefly chronic marginal periodontal disease and disease Furthermore; it's been detected in patients with acute lesion periodontal disease (7,8,9).

The prevalence of *T. tenax* in many series ranged from four to fifty three, it's going to exceed the prevalence within the duct of *Trichomonas vaginalis* in adult females (10,11,12).

*T. tenax* have been found in other diseased organs near the oral cavity including sinusitis, tonsillitis, jaw abscess, cancer of the lingua and oesophagus and in the hypochlorhydric stomach (3). The number of trichomonads found in oral washing is rather low, and detection by conventional methods such as wet-mount preparations or staining may be sensitive. In addition, staining is useful for species identification, and culture techniques are routine use (13,14). This study was carried out to determine the prevalence of oral trichomoniasis by direct smear methods and giemsa staining with microscopic observation to detect of *T. tenax* (15).

## 2. Materials and Methods

During the period from September 2017 to May 2018, 383 saliva and cough samples were collected from both sexes according to the age groups of the health centers, hospitals and private clinics of the center and villages of karbala Governorate using an information form including the name of the patient, age, sex, residence, level of living and illness in an attempt to study the epidemiology of oral parasites *T. tenax* in karbala Governorate.

### 3. Methods of examination

#### 3.1. Direct Smear Method

The samples are taken from the mouth to the reviewers with the help of the specialist doctor. The sample is then shown on the glass slide and then examined by the light microscope under the small and large powers (X10, X40, X100 and Phase Contrast microscope). Thus we can observe the movement of the parasitic parasites which are characteristic of the parasites Of others

#### 3.2. Wet Preparation Method

The sample drowned from saliva taken from the mouth of the oral patient is placed on a clean and sterile glass slide and mixed well with the saliva. The slide cover is then placed under the major force of the microscope with an X400 magnification force to detect*T. Tenax* and white blood cells. Phase Contrast microscope to see the effective parasite movement compared to other parasites and to see that it attacks white blood cells and bacteria. In wet samples, *T. tenax* parasites are movable and can be distinguished from the capillaries and ripple of the lateral membrane. If the characteristics of the parasite are present in the sample, the result is positive in terms of size, shape, shape of the nucleus and number of capillaries.
3.3. Staining method

This method is taken by taking a swab from the mouth and placing the saliva in the swab on a glass slide, then stabilized by flame, and then put a type of dye used such as a dye (Giemsa stain) and this dye to distinguish the flagella and Cytoplasm of the parasite after the parasite Distilled water is diluted to dilute the dye and then scan under the microscope.

4. Results

4.1. Study of T. tenax parasite spread in Karbala

The study was conducted in the period from September 2017 to April 2018, to investigate the infection of T. tenax parasites in the holy Karbala, where the number of samples examined 383 samples of people with dental problems and gums for different age groups (5 age groups) Hospitals and health centers in the holy province of Karbala The results showed that the total number of samples infected (31) samples, and the percentage of infection with total T. tenax 8.09%, and was the highest rate of infection in the month of January 2018, with a rate of 13.33%, while The lowest percentage of infection in September and October 2017, where the rate of infection 0%, the results of the statistical analysis showed no significant differences in the percentage of infection for males and females during the months of the study as the value of Kay calculated (9.516 *) as in Table (1).

| Month     | NO. | Mail | Infected | % | Female | No | % | Total | % |
|-----------|-----|------|----------|---|--------|----|---|-------|---|
| September | 22  | 16   | 0        | 0 | 6      | 0  | 0 | 0     | 0 |
| October   | 42  | 25   | 0        | 0 | 17     | 0  | 0 | 0     | 0 |
| November  | 47  | 27   | 1        | 3.7| 20     | 2  | 10| 3     | 6.38|
| December  | 68  | 59   | 4        | 6.77| 9     | 2  | 22.22| 7 | 10.29|
| January   | 60  | 42   | 4        | 9.52| 18    | 4  | 22.22| 8 | 13.33|
| February  | 59  | 37   | 3        | 8.1 | 22    | 3  | 13.63| 6 | 10.16|
| March     | 49  | 32   | 2        | 6.25| 17    | 1  | 5.88| 3 | 6.12|
| April     | 36  | 27   | 3        | 11.11| 9    | 1  | 11.11| 4 | 11.11|
| Total     | 383 | 265  | 18       | 6.79| 118   | 13 | 11.01| 31| 8.09|

X² = 6.938 *  
P value = 0.435

Table (1).

4.2. T. tenax infection by sex

The results of the present study showed a difference in the incidence of T. tenax parasites between females and males. The total female infection rate was 11.01%, which is higher than the total male rate of 6.79%. The results of the statistical analysis showed no significant differences between males and females and the calculated value of Kay was 1.959.table(2)

| Sex | No | Infected | %  |
|-----|----|----------|----|
| Mail| 265| 18       | 6.79%|
| Female| 118| 13       | 11.01%|
| Total| 383| 31       | 8.09%|

X² = 1.959 *  
P value = 0.162

Table (2)
4.3. *T. tenax infection by smoking for both sexes*

The study found that smokers had the highest rate of infection compared to non-smokers, with 15.7% of smokers and 4.58% of non-smokers. The incidence of smoking among males was 14.2% and 22.72% respectively. Statistical analysis showed significant differences in the incidence of parasitic infection among non-smokers and smokers. The calculated value of Kay (13.765)

| Type    | Male | Female | No. | Infected | %  | No. | Infected | %  |
|---------|------|--------|-----|----------|----|-----|----------|----|
| Smoking | 96   | 14     | 15.7 | 19       |    | 22  | 5        | 22.72 |
| Non     | 169  | 4      | 2.36 | 96       | 8  | 8   | 3.33     | 12   |
| Total   | 265  | 18     | 6.79 | 118      | 13 | 13  | 11.01    | 31   |

- **X²**: 14.432*  3.783**  13.765*
- **P value**: 0.0001  0.052  <0.0001

4.4. *T. tenax infection by diabetes for both sexes*

The results showed that the incidence of parasitic infection in people with diabetes was higher than those who did not. The rate of infection was 12.97% for people with the disease and 5.55% for non-infected people.

The highest incidence of parasitic infection was found in men with diabetes, 14.13% and 2.89% for males without diabetes. The results of the statistical analysis showed significant differences in the incidence of parasitic infection among diabetics and non-infected patients, and the value of Kay was calculated (6.382).

| Type    | Male | Female | Total |
|---------|------|--------|-------|
| Diabetes| 92   | 13     | 12.97 |
| Non     | 173  | 5      | 5.55  |
| Total   | 265  | 18     | 8.09  |

- **X²**: 11.986*  0.183**  6.382*
- **P value**: 0.001  0.669  0.012

4.5. *T. tenax parasites infection by oral disease for both sexes*

Results showed that the incidence of *T. tenax* parasites in people with oral diseases was greater than that of non-oral patients. The incidence of parasitic infection was 12.58% in individuals with oral diseases, while in individuals without the disease was 5.17%.

The results showed that the incidence of parasitic infection among females suffering from oral diseases was greater than that of infected males. The infection rate was 13.04% for females and 12.38% for males with the same oral diseases. The results of the statistical analysis showed significant differences in the incidence of parasitic infection among oral and non-infected patients and the value of Kay was calculated (6.752).
The incidence of parasitic infection among people with gum disease was the highest among oral diseases, with 20.83%, while the lowest infection rate was 9.09% for those with gum disease.

The highest incidence of parasitic infection among females was 18.75% for gum disease, and 0% for gum disease. For males, the highest incidence of parasitic infection was 15.55% for gum disease and 0% for acute gingivitis. The results of the statistical analysis showed no significant differences in the incidence of parasitic infection between oral and non-infected patients and the value of Kay was calculated (2.277).

### Table (6)

| Oral diseases     | Male   | Female | Total     |
|-------------------|--------|--------|-----------|
|                   | No.    | No.    | No.       | %       | No.    | %       | No.       | %       |
| Bleeding gums     | 21     | 12     | 33        | 14.28   | 3       | 9.09    |
| Gum pockets       | 45     | 16     | 61        | 15.55   | 3       | 11.11   |
| Acute gingivitis  | 6      | 3      | 9         | 0       | 1       | 11.11   |
| Supportive tissue disease | 33 | 15 | 48 | 9.09 | 2 | 14.28 |
| Total             | 105    | 46     | 151       | 12.58   | 19      | 12.58   |
| \(X^2\)           | 1.665* | 3.349* | 2.277*    |         |         |         |
| P value           | 0.645  | 0.341  | 0.517     |         |         |         |

#### 4.6. tenax parasite incidence according to the social status of both sexes

The current study showed that parasitic infection was higher in married people than in unmarried persons (8.59% and 7.40%, respectively).

The results of the statistical analysis showed no significant differences in the incidence of parasitic infection among married or unmarried persons and the calculated value of Kay was (0.178).
4.7. *T. tenax* infection by age groups of both sexes

The highest incidence of parasitic infection was in the age group (46-55), where the rate of infection was 12.19%, and the lowest rate of parasitic infection was in the age group (56 - and more) with a rate of infection of 2.56%. The results of the statistical analysis showed no significant differences in the incidence of parasitic infection in the age groups.

| Age categories | Sex | No. | Infected | %   | No. | Infected | %   | No. | Infected | %   |
|----------------|-----|-----|----------|-----|-----|----------|-----|-----|----------|-----|
| 15-25          | Mail| 21  | 0        | 0   | 35  | 2        | 5.71| 56  | 2        | 3.57|
| 26-35          |     | 46  | 2        | 9.52| 21  | 2        | 9.52| 67  | 4        | 5.97|
| 36-45          |     | 78  | 6        | 7.69| 20  | 3        | 15  | 98  | 9        | 9.18|
| 46-55          |     | 91  | 9        | 9.89| 32  | 6        | 18.75| 123 | 15       | 12.19|
| >56            |     | 29  | 1        | 3.44| 10  | 0        | 0   | 39  | 1        | 2.56|
| Total          |     | 265 | 18       | 6.79| 118 | 13       | 11.01| 383 | 31       | 8.09|
| X²             |     |     |          |     |     |          |     | 3.956*| 4.565*  | 6.487*|
| P value        |     |     |          |     |     |          |     | 0.412| 0.335   | 0.166|

5. Discussion

5.1. Study of *T. tenax* parasite spread in Karbala

The current study shows that the rate of infection in the province of Karbala, holy *T. tenax*, 8.09%, an approach to many studies, including the study of the Sultan (2012), which recorded the incidence of parasitic infection 7.81% in the province of Babylon and studying ALKhayat, (2016) The percentage of infection was 7.89% in Baghdad governorate and the study of Mahdi and Al-Saeed (1993) with 9.8% in Basrah Governorate and Gharavi et al. (2006) in Iran with 9.2% ) In Saudi Arabia and the incidence of parasitic infection was 9.5%

On the other hand, if the results of this study are compared with other studies, we find that the percentage of parasitic infection in the holy province of Karbala is much lower than that reached by Obaid (2008) in Najaf governorate, with an infection rate of 46% and Atheri et al. In Egypt, the incidence of parasitic infection was 20% and the study of Onyoid (2011) in Nigeria was 35% and the study of Feki and Molet (1990) in France was 35.5%

Perhaps the reason for the fact that the incidence of parasitic infection in the holy province of Karbala is low to raise awareness of health and attention to oral hygiene and dental. Or because of the use of phage, which works to eliminate the parasite.

5.2. Rate of infection of *T. tenax* parasites by infection by sex:

The study found that the percentage of female parasite infection was 11.8%, which is higher than the total male percentage of 6.79%. The result was identical to a number of studies, including Frederick and Schuster (1984) In the United States of America and the study of Kurnatowska.
On the other hand, this study showed different results from a number of studies, including al-alkafaji (2011) and al-alkafaji (2011). The percentage of females was 16.8%, less than 24.7%, and Athari et al (2007). Iran with 16.4% and 25.3%

The reason for the high rate of infection in females may be due to lack of attention to oral and dental hygiene, in addition to the fact that females have habits that may contribute to the spread of parasites, such as frequent kissing, and talk for long hours and a close distance, which also contributes to the spread of the parasite through fly spray.

The study showed that smokers have the highest rate of infection compared to non-smokers, with 15.7% of smokers and 4.58% of non-smokers. Smoking is one of the most important factors affecting parasitic infection., tenax infection by smoking for both sexes, This was confirmed by many researchers so the results of the current study match them, and showed that there is an effect of smoking factor in the incidence of oral parasites, including the study Ibrahim and Abbas, (2012) in Baghdad and study Segovic et al; (1993) in Croatia and the study of Matheu, (2017) in France.

This is because smokers often have little interest in cleaning teeth and gums, and tooth decay is higher than non-smokers (16).

In addition, smoking creates an environment conducive to the growth of certain types of pathogens, and works to increase the destructive effect of the supporting tissue by weakening the natural defenses of the host, and contributes to many oral diseases and disorders such as oral cancer, pharynx and tooth decay (17,18).

Studies have shown that smokers are more likely to develop acute back pain, damage to the supporting ligaments, gum disease and tooth loss than non-smokers (19).

5.3. Rate of infection of T.tenax parasites infection by diabetes for both sexes:

The results showed that the incidence of parasitic infection in people with diabetes is higher than those who are not infected, with a rate of infection of 12.97% for people with the disease, and 5.55% for people who are not infected and this corresponds to what has been reported by many studies that there is an increase in the rate The incidence of oral parasites in people with diabetes is five times that of healthy people (20). This is also confirmed by Emrich (1991) that patients with diabetes are more likely to be infected with oral parasites than healthy people.

In another study, the results showed a high incidence of this parasite in patients with diabetes, with 74% (Mendoza et al., 2003), which is much higher than we found. In another study, people with uncontrolled diabetes had supportive tissue diseases Gums and hemorrhages with a high incidence of parasite infection (21).

Firatli (1997) attributed this to the fact that diabetes affects the regulation of cellular substances, the disruption of oxygen distribution, the release of metabolic activity products, as well as the damage of white blood cell migration, all of which increase the chance of gum disease in diabetics and thus increase the chance Oral parasites infection.

5.4. Rate of infection of T.tenax parasites infection by oral disease for both sexes:

The study found that the highest incidence of T. tenax parasites was among patients with oral diseases, especially gum disease. Some studies have indicated that high parasite infection is associated with a range of factors, including the health of the mouth, especially gum health and the condition of the supporting tissue (22).
There is a direct relationship between *T. tenax* infection and certain factors such as supportive tissue disease, periodontal disease, inflammation and tooth decay (23).

Many studies have confirmed the prevalence of *T. tenax* in patients with oral and gum disease (24,25,26)

5.5. Rate of infection of *T. tenax* parasites by educational attainment of both sexes:

The effect of the educational level factor on *T. tenax* parasites showed that the highest rate of parasitic infection among the illiterate people was 12.41%, while the rate of parasitic infection among university graduates was 3.44%. The results of this study were identical to those of Ozumba et al. (2004) in Nigeria and the study of Osorio et al. (2009) in Venezuela. The prevalence of parasitic infection in illiterate people may be attributed to lack of health and cultural awareness, lack of attention to oral and dental hygiene, lack of adequate hygiene guidance, and the spread of bad habits such as the use of matchstick and other tooth cleaning products that lead to increased oral parasites. While we see the opposite in people in the advanced stages of education may be due to high health and cultural awareness and awareness of the importance of oral and dental care and follow the health guidelines to maintain oral hygiene and dental

5.6. Rate of infection of *T. tenax* parasites the social status of both sexes:

As for the social status factor, the current study showed that the incidence of parasite infection was close. There were no significant differences in the rate of infection between married people and unmarried persons, with 8.59% and 7.40% respectively. So it was difficult to compare the results of this study with other studies.

5.7. Rate of infection of *T. tenax* parasites infection by age groups for both sexes:

The results of the present study showed the relationship between parasitic infection and age groups. The results showed that the age group (55-46) was the highest among the other age groups, with an infection rate of 12.19%. The lowest incidence of parasitic infection was in the age group (56-And more) with an infection rate of 2.56%. The results of the present study were identical to those of Grossi et al. (1995); Streckfus et al., (1999)

Vravlic and Tomovas (1992) and Feki and Molet (1990) found that *T. tenax* recurrence increased with age, and in Sarowska et al. (2004) study of the severity of *T. tenax* parasite injury for supportive tissue patients Spread this parasite in children. Atari, et al. (2007), in his study of gingival dental plaque for 160 patients with supportive tissue disease and gingivitis and 160 healthy individuals reported that *T. tenax* was not associated with age.

In a study carried out by Vravlic et al. (1991) found that the incidence of *T. tenax* parasites is rare among young children and old age, and was identical to the results of this study

This may be due to the fact that the children teeth teeth of a newly developed and is in the process of growth and composition, as well as the mother's care to clean the mouth and teeth of the child in addition to the fact that children are not exposed to the factors that contribute to the incidence of such parasite most important factor of smoking, In the case of elderly people, the reason for their low incidence may be due to the fact that the oral environment is not suitable for the growth of the parasite because most of them are taking antibiotics that will eliminate such parasites, and the fact that the teeth have nothing or less If there are no parasites, the parasites can not find the appropriate environment for them to complete their life cycle, The increase in the incidence of parasitic infection in the age group (21-30) years may be due to lack of awareness of adequate oral hygiene and care of teeth and gums, and may also be due to frequent exposure to polluting factors such as smoking and
drinking Arquila, which has become a phenomenon spread recently, especially among the category Frequent coughing among people may be caused by the spread of the parasite or the incidence of certain diseases such as diabetes, leading to the provision of an environment suitable for oral diseases and parasites.

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