

ORAL PROTOZOA IN LAHORE: PREVALENCE ACROSS RURAL AND URBAN COMMUNITIES

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Abstract:

Objective: The aim of the study was to know the Prevalence and role of mouth parasites in patients attending the Out Patient Department of Oral and Maxillofacial Surgery Department.

Study Design: A Retrospective Study.

Place and Duration: In the Oral and Maxillofacial Surgery Department of Mayo Hospital Lahore in Collaboration with E.N.T Department for one-year duration from December 2017 to December 2018.

Methods: A total of 150 Patients (90 males and 60 females) were screened by taking mouth swabs in a sterile tube containing normal saline solution and observing under x 100 with oil immersion.

Results: The overall infection of both *Entamoeba gingivalis* and *Trichomonas Tenax* was 60% with males showing higher prevalence (61.1%) than females (58.3%). Out of 90 positive patients 57% were harboring *Entamoeba gingivalis* and 3.3% *Trichomonas Tenax*. A positive association was found between prevalence of mouth parasites and poverty, 71% of these patients were from poor class.

Conclusion: The infection rate was common in cigarette smokers than snuff (niswar) dippers. Not a single snuff dipper was found positive for *Entamoeba gingivalis* or *Trichomonas Tenax*.

Key Words: Parasitic infections, *Trichomonas*, *Entamoeba*.

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INTRODUCTION:

Oral protozoa *Entamoeba gingivalis* and *Trichomonas tenax* occupy a rather vague place in the history of research. Barrett and Smith reported that he observed *Entamoeba gingivalis* in almost all patients with periodontitis who were examined [1]. Bass and Johns reported that in 86 patients with periodontal disease, they found *E. gingivalis* and stated that there was no organism in many normal individuals [2]. They suggested that this protozoan could be pathogenic based on evidence that emetine hydrochloride, a therapeutic drug used against parasitic assays, gave beneficial results [3]. Additional studies of Kofoid revealed that *E. gingivalis* was present in 75% or more of people over 40 years of age. In this study, it has been shown that this organism is dominant in healthy mouths [4]. Bateman discovered *Trichomonas tenax* (later called *Trichomonas buccalis*) in 26.5% of diseased mouths and in 11.4% of normal mouths and found that diseased mouths provided a more suitable region for this organism than clean and healthy mouths, however. They still suspected their pathogenesis. He also mentioned the culture methods which are superior to the wet contamination method to detect this organism [5]. In 1958, Wantland et al. Initiated a comprehensive study of oral hygiene conditions, including the incidence of these two oral protozoans [6]. The aim of this study was to determine the prevalence of oral parasites in the region.

MATERIALS AND METHODS:

This Retrospective Study was held in the Oral and Maxillofacial Surgery Department of Mayo Hospital Lahore in Collaboration with E.N.T Department for one year duration from December 2017 to December 2018.

Materials used for staining.

1. Slides 2. Curette 3. Test tube 4. Normal saline solution 5. Light 6. Methanol 7. Alcohol 8. Eosin 9.

Microscope 10. Water 11. Canadabalsum 12. Immersion 13. Xylem 14. Cotton swab 15. Glass covers 16. Nail polish 17. Dropper 18. Glycerin.

In order to determine the frequency of oral parasites, namely *Entamoeba Gingivalis* and *Trichomonas Tenax*, a total of 150 mouth swabs were collected from patients in rural and urban areas. The oral examination was performed using dental mirror, Carries probe and CPITN (Community Periodontal Treatment Needs Index). (Almas 1996) Joint inspection tools were also used, ie buccal mirror, periodontal thin probes (Iqbal 1981). Buccal extracts were examined by an indirect method to determine the presence of protozoan (buccal parasites). Mouth extract was taken from the supra and subgingival regions of the mouth with the help of the curette. After 1-2 minutes, a drop of methanol was added onto a clean slide droplet (kept in normal saline) and then a drop of 70% alcohol for 5 minutes was added drop wise. After that, we added the eosin solution and waited for a while, then placed a drop of canadaaballum in the material and then placed a coverslip. Take care to avoid the formation of air bubbles. The slides were ready for microscopic examination. Scanning was performed by immersing it in oil under x100 targets. At the time of the extraction of oral extracts, detailed information about the variables of the study was compiled. Various variables studied;

1 Distribution of patients by gender.

2 The patients Socioeconomic status.

3 Social Habits a. Smokeless tobacco consumption b. Smoking habit (Niswar)

RESULTS:

Of the 150 oral swabs collected from rural and urban areas, 90 were positive for moth parasites, and the overall incidence of parasitic infections was 60% (Table 1 and Figure 1).

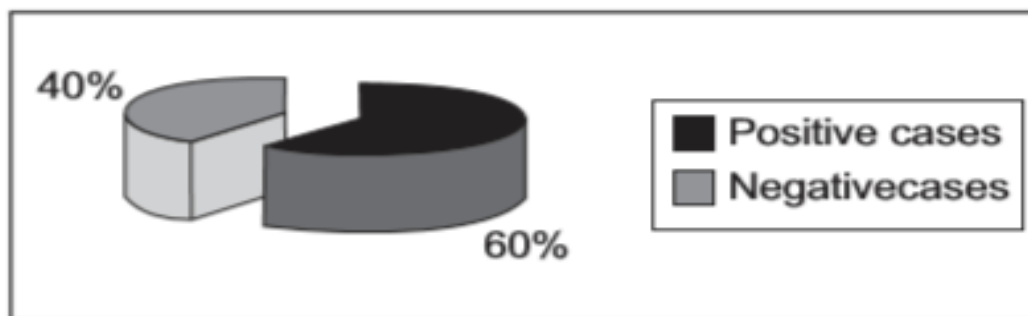


Fig. 1. Overall incidence of mouth parasites

85 of 90 positive cases were found positive. Although 5 of the cases were positive for protozoan parasites, *Trichomonas tenax*, ie 3.3%(Table 1), 61.1% of the parasites were positive for the protozoan mouth.

Total sample	Total positive	E gingivalis	%	T tenax	%
150	90	85	57%	5	3.3%

TABLE 1. SPECIESWISE INFECTION

Of the 60 female patients, 58.3% were positive. This shows a 3% higher incidence in females than in males. (Table 3) A positive relationship was found between the incidence of oral parasites and poverty. In the subclass group, a high rate of 71% was observed (Table 2).

Socioeconomic class	Total number of cases	Number of positive class	Percent positive
Upper	30	10	33.3%
Middle	50	25	50%
Lower	70	55	71%

TABLE 2. SOCIOECONOMIC DISTRIBUTION OF PATIENTS

22 of the 40 smokers were found to be positive 55%, ie 40% higher than the non-smokers. (Table 3).

No	Contents	Total no of cases	No of Positive cases	Percent positive
1)	Male	90	55	61.1%
	Female	60	35	58.3%
2)	Smokers	40	22	55%
	Non Smokers	50	20	40%
3)	Snuffdippers	30	Nil	Nil
	Non snuffdippers	60	60	50%
4)	Tooth brush users	60	25	42%
	Non- users	90	60	67%
5)	Miswak users	50	25	50%
	Non users	40	30	75%

TABLE 3: INFECTION IN DIFFERENT GROUPS OF INDIVIDUALS

Among the 30 tobacco patients, gingivalis E and T-tenax were not positive. It is interesting to note that a single protozoan parasite is not present in the mouth of tobacco-dependent patients. (Table 3). Among the 60 toothbrush user examples, 25 were positive, ie, 42%. Of the 90 people who did not use toothbrushes, 60 were found positive (67%). (Table 3). Among the

50 examples of Miswak users, 25 are positive, ie 50%. Those who did not use Miswak were 75% (Table 3).

DISCUSSION:

Studies on oral and dental parasites are very limited and have been performed only in some countries.

These studies revealed the presence of two parasitic protozoa called *E. gingivalis* and *T. tenax*. *E. gingivalis* belongs to the Entamoebidae family and Tubulinae subgroup [7]. This parasite is only found in the form of trophozoites ranging from 5-35 μm . Morphologically, this protozoan is similar to *E. histolytica*, and diagnosis requires sufficient attention to distinguish this protozoan from *E. histolytica* released from pulmonary abscesses [8]. The vagina and uterus are considered as sufficient growth media for the organism. Different forms of contamination include close contact, dirty food, dishes and mouth drops. The prevalence rate in periodontitis patients varies between 55% and 86%. The prevalence rate depends on age and gender [9-10]. The prevalence reported in Japan and the Czech Republic is 9% and 8-30%, respectively. According to some studies, this amoeba is considered an important cause of periodontal diseases [11-12]. It causes itching of the gums, palate pain, unpleasant smell of mouth, fatigue, severe headache and periodontal tissue damage. *T. tenax* is one of the members of the Trichomonadidae family. The flagellated organism is present only in the form of trophozoite and its size ranges from 5 to 12 μm . *T. tenax* and *E. gingivalis* are inhabitants of the mouth, but *T. tenax* is more active. *T. tenax* and *E. gingivalis* are transmitted in the same way, but *T. tenax* can survive for several hours to several days in water [13]. The infection rate for *T. tenax* ranges from 0 to 20% according to the hygienic condition of the mouth. The prevalence of *E. gingivalis*, *T. tenax* and mixed infection was 39%, 23% and 17.7%, respectively. We also have a report of pulmonary Trichomonas. Epithelial cells are broken down due to red blood cells and leucocyte parasites. The prevalence of dental caries and gum diseases is due to poor oral hygiene standards, diet regimen, lack of dental education, socioeconomic status, ignorance of the value of toothbrushes, or a wooden stick (Miswak). Only 10% go to the treatment of dentists [14]. Most of their income is difficult for people who spend on food, private dental health, even emergency dental treatment is not possible (Iqbal 1981). The present questionnaire reveals that the previous statement is not only true but also has a greater density. Muslims use different devices for the protection of oral hygiene. Miswak is one of them. Miswak is derived from the Arak plant (Salvador Persia), which grows mainly in Saudi Arabia and other parts of the Middle East. It is used by the Muslim communities in the world as traditions and spiritual habits. One should educate people living in the most remote areas of Pakistan about how and why to use Miswak in the teeth. Due to the use of miswak, calcium and chloride content increases and phosphate falls [15]. Another method for protecting

oral health is the manufacture of toothbrushes that are common in most industrialized countries. Unfortunately, oral hygiene and oral diseases are neglected by most people. Biological changes occur in the mouth of tobacco addicts. Chewed tobacco in the oral cavity. In our opinion, the pH of the mouth of the tobacco addict was deteriorated in such a way that the protozoan could not live there. It is interesting to note that there is no single protozoan parasite in the mouth of tobacco addicts. According to Crossner and Holm (1975), the socio-economic factor of a particular population directly affects oral health. The effect of protozoan on different socioeconomic groups was also observed in the study. The highest incidence is found in the subgroup.

CONCLUSION:

According to WHO, the toothbrush and chewing rod (Miswak) may be effective mechanical means for removing the plaque; because both instructions are necessary to ensure that they are used correctly to effectively remove the plaque without traumatizing the oral tissue. This questionnaire is consistent with the previous expression and people who brush their teeth with toothpaste 4 times a day for 4 minutes make their gums healthy. Therefore, for the preparation of every required prayer, it should include the use of Miswak for cleaning of teeth and the removal of the bad smell. According to Pervaiz, many people use Miswak or brush, but oral hygiene is very bad. This is because many people do not understand the correct use of the toothbrush or wooden stick Miswak.

REFERENCES:

1. Patel, N. (2019). *The Prevalence of Protozoa During Canine Periodontal Disease* (Doctoral dissertation, Department of Infection, Immunity and Inflammation).
2. Sigurdson, G. T., & Giusti, M. M. (2019). The Stability and Absorption of Anthocyanins in the Mouth. In *Anthocyanins from Natural Sources* (pp. 186-215). Sigurdson, G. T., and M. M. Giusti. "The Stability and Absorption of Anthocyanins in the Mouth." In *Anthocyanins from Natural Sources*, pp. 186-215. 2019.
3. Khan, A., & Rao, T. S. (2019). Molecular Evolution of Xenobiotic Degrading Genes and Mobile DNA Elements in Soil Bacteria. In *Microbial Diversity in the Genomic Era* (pp. 657-678). Academic Press.
4. Hakeem, Khalid Rehman, Waseem Mohammed Abdul, Mohd Muzzammil Hussain, and Syed Shueb Iqbal Razvi. "Traditional Information About Herbal Medicine of Oral Activity."

- In *Oral Health and Herbal Medicine*, pp. 17-18. Springer, Cham, 2019.
5. Alagoa, K. J., P. Adigwe, and P. S. Daworiye. "A Survey of Zooplankton Community Structure in Taylor Creek, Zarama Axes, Bayelsa State, Nigeria." (2019).
 6. Zou, Gang, Ralf Altmeyer, and W. A. N. G. Yizhuo. "Composition and combined medication method for treating enterovirus infection." U.S. Patent Application 16/073,487, filed January 31, 2019.
 7. Nasreen, Hasina, and Mahtabuddin Hassan. "Nitazoxanide—A New Option in Biliary Ascariasis." *ABC Research Alert* 7, no. 1 (2019). Nasreen, H., & Hassan, M. (2019). Nitazoxanide—A New Option in Biliary Ascariasis. *ABC Research Alert*, 7(1).
 8. Kern, T., & Nielsen, T. (2019). Oral Microbiota and Liver Disease. In *The Human Gut-Liver-Axis in Health and Disease*(pp. 105-120). Springer, Cham.
 9. Zingel, Priit, Helen Agasild, Katrit Karus, Linda Buholce, and Tiina Nõges. "Importance of ciliates as food for fish larvae in a shallow sea bay and a large shallow lake." *European journal of protistology* 67 (2019): 59-70.
 10. Zhao, Zhipeng, Dong Ren, and Chungkun Shih. "Termitoidae—Termites." *Rhythms of Evolution: Insect Fossils from the Mid Mesozoic of Northeastern China* (2019).
 11. Yamada, Taihei, Takaaki Osako, Atsuyoshi Iida, Tetsuya Yumoto, Kohei Tsukahara, Akihiro Watanabe, Hiromichi Naito, and Atsunori Nakao. "Increase in the incidence of dermatitis after flood disaster in Kurashiki area possibly due to calcium hydroxide." *Acute Medicine & Surgery*.
 12. Kay, Jason G., Jill M. Kramer, and Michelle B. Visser. "Danger signals in oral cavity-related diseases." *Journal of leukocyte biology* (2019). Kay, J. G., Kramer, J. M., & Visser, M. B. (2019). Danger signals in oral cavity-related diseases. *Journal of leukocyte biology*.
 13. Ombugadu, A., Echor, B. O., Jibril, A. B., Angbalaga, G. A., Lapang, M. P., & Micah, E. (2019). Impact of Parasites in Captive Birds: A Review. *Current Research in Environment and Biodiversity*, 2019(01), 2.
 14. Belanche, Alejandro, Juan M. Palma-Hidalgo, Ibtissam Nejjam, Rosa Serrano, Elisabeth Jiménez, Ignacio Martín-García, and David R. Yáñez-Ruiz. "In vitro assessment of the factors that determine the activity of the rumen microbiota for further applications as inoculum." *Journal of the Science of Food and Agriculture* 99, no. 1 (2019): 163-172.
 15. Guo, Congcong, and Henglong Xu. "Use of functional distinctness of periphytic ciliates for monitoring water quality in coastal ecosystems." *Ecological Indicators* 96 (2019): 213-218.