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# CHANGES IN SALIVA SECRETION IN THE CONTEXT OF TEETH LOSS

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## ABSTRACT

In the field of medical research there is a current trend to explore the importance and symptoms of saliva. This question, which more and more researchers in the forensic, systemic and dental fields have tried to answer and at the same time bring arguments for paying more attention, is related to the exhaustive and diagnostic role of saliva in the patient's health. Conclusions. Given the central role that saliva plays in maintaining oral health and the benefits of using saliva as a diagnostic tool, a general knowledge of the basic physiology of saliva is important from the point of view of clinical practice.

**Key words:** *saliva, dentures wearers ,dry mouth syndrome, etc*

## INTRODUCTION.

Saliva is a very valuable diagnostic fluid for both oral and systemic diseases. Its abundance in biomarkers, non-invasive harvesting and the need for small samples required for analysis recommend this amalgam of organic and inorganic substances as a means of diagnosis and monitoring for multiple pathologies[1].

In addition, the existence of correlations between serum and salivary concentrations for many biomarkers promotes the use of saliva as a remarkable alternative diagnostic fluid [2].

In recent decades, saliva has become one of the major research topics due to its advantages.

Collecting saliva samples is easy, non-invasive, so it ensures much better cooperation with patients, especially if we are referring to children or the elderly, patients who are much more reluctant to collect blood or urine. [2,3].

A wide range of studies in the literature have focused on the use of saliva for the diagnosis and monitoring of many oral and systemic conditions, including oral squamous cell carcinoma, autoimmune diseases (Sjögren syndrome), Cushing's syndrome, cardiovascular disease, viral and bacterial infections [4,5].

Saliva biomarkers are already widely used in diagnosing athletes and for application, scientific purposes: monitoring physiological tasks, assessing physical recovery, etc. [6]. It has been found that saliva reflects the state of the body's metabolism [7, 8, 9].

The determination of nitrites in saliva is recommended for use in clinical laboratories in order to control the therapeutic and hygienic effects on the microflora of the esophagus and stomach [10,11]. The informative value of oral fluid

parameters in assessing the body's immune response has been demonstrated [12].

The most promising indicator for evaluating the intensity of oxidative stress is the antioxidant activity of biological fluids, including saliva. The chronophysiological peculiarities of the dynamics of the antioxidant activity of saliva were determined, the stability of this parameter was demonstrated depending on age and gender [13].

Hyposalias is accompanied by chemical changes and changes in pH, the concentration of immunoglobulins and electrolytes changes, which leads to a significant change in the oral microflora, the patient having a dry mouth (xerostomia): saliva becomes very thick and viscous, loses much among its properties, including lubrication (remains adherent to dental surfaces), the oral mucosa becomes atrophic and swallowing and speech functions become painful [14,15].

These changes are due to a drastic decrease in serous secretion, because glandular acini that secrete serous saliva are much more sensitive to radiation than acini that secrete mucus. They are affected later.

Edentation has a number of harmful consequences for oral health and general health. The consequences at the oral level range from the well-known resorption of the residual ridge to an affected masticatory function, an unhealthy diet, social disabilities and a poor quality of life. Moreover, long-term associated drugs often found in edentulous subjects with removable dentures may be related to dental stomatitis, ulceration, and oral candidiasis [16,17].

Another common consequence of edentulousness is impaired normal salivary function, an important factor in maintaining oral health.

Reduced salivary flow, which is relatively common in geriatric patients, leads to discomfort when wearing dentures and may be a risk factor for soft tissue inflammation in response to the oral microbiota [18].

The question, which more and more researchers in the forensic, systemic and dental fields have tried to answer and at the same time bring arguments for paying more attention, is related to the exhaustive and diagnostic role of saliva in the patient's health. Although a significant number of publications have insisted on the etiology and complications of hypofunction of the salivary gland, very few health professionals collect saliva tests. As with urine and blood, the quality and quantity of saliva are affected by a variety of medical conditions and treatments, as well as being influenced by the patient's psychological state [19].

## LITERATURE REVIEW

The saliva of edentulous subjects is characterized by an increased level of protein that does not derive from the secretion of the salivary glands. Cystatines are a superfamily of proteins whose main function in saliva is to provide protection in the oral cavity by inhibiting cysteine proteinases [20].

In humans, cysteine proteinase inhibitors cystatin A and B are present in the cytoplasm of all types of moist squamous epithelia.

However, they have also been detected in human saliva and it has recently been shown that S-glutathylated, S-cysteinylated and SS 2-mer derivatives are the main proteoforms.

Over time, people have given it importance from another perspective: saliva played a helpful role in pasting envelopes, stamps or at most in reporting cases of public speakers faced with the impossibility of having a coherent speech due to the feeling of " dry mouth".

This "dry mouth", medically called xerostomia, has been used since antiquity as evidence in the detection of lies, knowing since then that the emotional inhibition of salivation that gives the feeling of "dry mouth" is caused by anxiety, so of a potential truthful incrimination.

A review of the formation, function and dysfunction of saliva can determine the

Polymedicine is the most common cause of xerostomia (dry mouth) and hypofunction of the salivary glands (objective evidence of reduced salivary flow) in the elderly. The most common types of medication with potential salivary flow inhibitor are those with anticholinergic and sympathomimetic action[21].

Hypofunction of the salivary glands is a condition that is often overlooked, so many patients taking a medication that inhibits the flow of saliva are at increased risk of oral complications such as tooth decay or fungal infections. Therefore, the absence of subjective complaints caused by dry mouth does not indicate an adequate level of saliva production [22].

Accordingly, the diagnosis of medication-induced hyposalivation requires measurements of salivary flow.

Satisfaction with dentures has a multivariate character and many factors are associated with the function of the prosthesis, as well as with personal satisfaction factors. Functional disorders of the salivary glands can cause a reduction in salivary flow and subjective dryness that affect the complete retention of the denture. As we know, the presence of a thin layer of salivary film is essential for the comfort of the mucosa under the prosthesis and for the retention of the denture [23,21].

But,first of all, especially a complete upper prosthesis must have a good retention without causing pain in the oral mucosa. This is provided mainly by saliva.

Although numerous studies have been published on the properties and secretion of saliva, the effect of aging on saliva flow remains unclear, a decrease in whole saliva flow has been reported with age and the rate of total and parotid salivary secretion with age [23].

Part of the variation in results may be due to the fact that "older people" can be described as over 60 years of age in some studies and over 80 years of age in others. It seems that some studies could have included subjects with systemic drugs. Part of this conflicting observation of age-related changes in debt [24].

Ship et al. [25], because they claimed that postmenopausal women were reported to have a decrease in salivary flow, but this loss of estrogen would not be sufficient to explain the reduced flow in women such as Parvinen and Larmas suggested that age is a more important factor in parotid saliva flow [26].

The results also indicated that the change in total salivary flow was related to the age factor and this was in agreement with Al-Shimmary [27] and Marton and Boros [28] who measured the secretion. salivary glands in 57 people aged (50-60) years and found that the mean values were ($0.19 \pm 0.36$ ml / min) and in 35 people aged (59-75) years, the mean values were ($0.36 \pm 0.33$ ml / min), he found a correlation between the secretion rate and age in the elderly group (50-75) years.

Bertram's research concludes that men in the age group over 65 have a significantly lower secretion rate than those in the age group under 65. The values of secretion rates for women in these two age groups indicate the same change in secretion, but the difference is not statistically significant.

Mason and Chisholm measured salivary flows in different age groups by stimulating the parotid with citric acid [29].Flow rates decreased with age in both men and women, although the differences were significant only for the female group.

Also, the concentration of some of the constituents, for example amylase and electrolytes, varies with age. Meyer et al. recorded a 75% decrease in enzyme activity in the saliva of subjects over 60 years of age, both at rest and after stimulation. Studies on electrolyte saliva concentrations in old and young subjects are few, and their results are sometimes contradictory; however, these studies indicate a general trend towards increased concentrations of electrolytes in mixed saliva at rest in elderly individuals.

The incidence of marked saliva depletion in older populations is unknown. Epidemiological studies of groups aged about 70 years indicate that a reduction in the rate of saliva stimulated by half affects

about 10-15 percent and a reduced flow of three quarters (less than 0.5 ml /min) affects 2-4 percent, the incidence being higher in women than in men.

In the denture-wearers population, the wetting mechanism of saliva is necessary to create adhesion, cohesion, and surface tension to ultimately lead to increased maintenance of the dentures.

Clinical experience suggests that wearers of complete dentures with xerostomia have more intense painful areas than patients with normal salivary flow. In studies, xerostomic patients wearing a removable denture reported pain while eating and talking.

Ikebe et al. reported that there is no association between salivary flow and number of teeth, but added that perceived salivary flow was significantly lower in people with fewer teeth [30].

Previous studies have suggested that with tooth loss, bacteria associated with hard surfaces (e.g., Strep. Mutans), strict anaerobes that are generally found in periodontal pockets (Gram anaerobes - black pigmented genera P.ginigivalis and Prevotella and Spirochetes) and organisms tend to disappear from the oral cavity.

On the other hand, Staph. aureus are found in the saliva of healthy subjects over the age of 70 , as well as in the oral mucosa of denture wearers. Several studies indicate that the level of Lactobacillus in the saliva of the edentulous mouth is very low. It constitutes less than 1% of the total flora.

But he also notes that these microorganisms return to the same level or rise even higher than in the dentate mouth when the prostheses are worn.

Prevotella spp. Black pigmented bacteriosis also appears to be a preferable inhabitant of the oral mucosa and is considered the normal oral flora of edentulous subjects wearing dentures. Prevotella intermedia was recovered in complete denture wearers for a longer period of time (on average 20 years) and was not detected in subjects with a period of 6.6 years.

This suggested that the absence of Prevotella intermedia shortly after extraction may reflect only a temporary event . Kulekci et al. identifies black Gram-ve anaerobes pigmented in the saliva of both edentulous patients with or without dentures[31].

Candida albicans is usually a minor component of the oral flower. It is elevated in dental stomatitis and in the compromised medical patient. Candida albicans adheres to mucosal surfaces, plastic and acrylate.

It seems that the prevalence of oral flora in edentulous patients has shown great variation in the location and method of sample collection, the selective environment and the cultivation and interpretation of enrichment. It is also affected by the time of day and the period of use of the denture and the period of hours worn per day.

Newly edentulous patients after a period of one month of functional use of dentures showed no significant difference in the type of microorganisms except before insertion.

Staphylococcus auros, Diphtheroids, Veillonella and Acinetobacter were part of the normal flora of the edentulous patient unchanged by wearing dentures. While E coli, Klebsiella, Moraxella "Branhamella" began to be observed after wearing the dentures. Other microorganisms including Streptococcs and Candida were reduced and eventually Neisseria disappeared.

## CONCLUSIONS

Changes in salivary flow, pH, and salivary buffer capacity are relatively common in elderly patients with removable dentures, compromised general condition, and associated multi-medication. These changes may have implications for oral structures, their functional and supporting capabilities, the balance and tolerance of dentures, may be a risk factor for prosthetic stomatitis, oral candidiasis and some traumatic injuries caused by dentures.

Given the central role that saliva plays in maintaining oral health and the benefits of using saliva as a diagnostic tool, a general

knowledge of the basic physiology of saliva is important from the point of view of clinical practice.

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