

THE POWER OF SALIVA IN DIAGNOSTIC ORAL DISEASE

Arsovski Ljupka^{1*}, Nashkova Sanja¹

¹Faculty of medical sciences, University "GoceDelcev"- Stip, Republic of North Macedonia
e- mail: ljupka.arsovski@ugd.edu.mk, sanja.naskova@ugd.edu.mk



Abstract: Saliva is an extracellular fluid produced and secreted by the salivary glands in the mouth. In humans, saliva is about 99% water, plus electrolytes, mucus, white blood cells, epithelial cells (from which DNA can be extracted), enzymes (such as lipase and amylase), antimicrobial agents (such as secretory IgA and lysozymes). Saliva is an important diagnostic method, it helps in determining certain disorders/diseases of the orofacial system. Some bad habits such as smoking increase the secretion of saliva most likely as a result of a defense mechanism of chemical irritation. Of the enzymes, amylase has a role to clean the oral cavity, and also a protective role against caries. Role of saliva in remineralization Remineralization is directly dependent on the presence of ions in saliva. Supersaturation of saliva represents a barrier to demineralization and is a necessary prerequisite for the remineralization process. Also, the degree of saliva secretion depends on the feeling of fear, damage to the salivary glands from radiation to the head and neck, tumor of these glands, thyroid gland deficiency or when using drugs that, as one of the side effects, also have an antisialogogonic effect. Supersaturation of saliva represents a barrier to demineralization and is a necessary prerequisite for the remineralization process. Buffer systems affect the possibility of neutralization of ingested or generated acids. Bicarbonate is the most important buffering system in saliva. Thanks to the physical, chemical and antibacterial properties of saliva. Saliva is an ion reservoir, a buffer and has an antimicrobial effect. It helps in digestion, dissolving food residues, acts as a solvent allowing food to interact with the gustatory papillae, maintains water balance and rinses away food residues. Physical protection - The role of saliva in the physical protection of soft tissues is based primarily on its role of lubrication, soaking the oral mucosa, and at the same time it moistens the food and helps in the formation of the bolus and its swallowing. The clearance of carbohydrates from the mouth takes place in two phases. Fast clearance in the first 6 min, then clearance is slower. The clearance of fluorides is much slower than the clearance of sugars, because fluorides have the ability to bind to hard tissues.

Key words: antimicrobial, demineralization, diagnostic, protection, saliva.

Field: Medical sciences and Health

INTRODUCTION

Saliva is a complex fluid consisting of secretions from the major, major and minor salivary glands. Saliva can be used to diagnose any disease, from the orofacial system, or any bodily disease. In humans, saliva is about 99% water, plus electrolytes, mucus, white blood cells, epithelial cells (from which DNA can be extracted), enzymes (such as lipase and amylase), antimicrobial agents (such as secretory IgA and lysozymes).

MATERIALS AND METHODS

In the past few years, new research has been done proving that salivary biomarkers are an innovation in dentistry to detect certain oral diseases. In addition to biomarkers, it is certainly necessary to apply additional non-invasive diagnostic methods to establish a more accurate diagnosis. Nowadays, liquid biopsy is widely used, which allows to detect even tumor cells and, or fragments of tumor types. With these innovative diagnostic procedures, mutations can be almost perfectly detected in patients already diagnosed with lung cancer.

RESULTS

Saliva is very important in determining oral diseases. The quality of saliva is very important in diagnosis, as well as its quantity. During diagnosis, changes in the secretion of saliva, the formation of bacteria, as well as the analysis of the role of saliva on the occurrence of caries are analyzed. The

*Corresponding author: ljupka.arsovski@ugd.edu.mk



change in saliva secretion can be reversible, but it can also be irreversible, it all depends on numerous pathological factors. In addition, the conclusion is that saliva plays an important role in maintaining the integrity of oral tissues, also saliva has a role in digesting food, as well as in controlling the occurrence of infections, that is, it has a protective role.

DISCUSSIONS

Early detection of the disease is vital for a more successful therapy and a successful outcome of the therapy for a certain oral disease. Of course, early detection has an impact on preventing complications. Saliva is a method for diagnosis and early detection of disease in the orofacial system. Biomarkers, as well as genetic material and proteins, help further in diagnosing diseases. Apart from diagnosing oral diseases, saliva can be used as a diagnostic method for diagnosing other diseases, bodily, autoimmune, for example Sjögren's syndrome, cystic fibrosis, cardiovascular diseases, HIV, diabetes mellitus, caries, periodontopathy and early detection of oral cancer. Today, diagnostic tests are often used in the clinics themselves, and they are very accurate, precise, easy and efficient to use.

CONCLUSIONS

Saliva is a complex fluid consisting of secretions from the major, major and minor salivary glands. Saliva can be used to diagnose any disease, from the orofacial system, or any bodily disease. In humans, saliva is about 99% water, plus electrolytes, mucus, white blood cells, epithelial cells (from which DNA can be extracted), enzymes (such as lipase and amylase), antimicrobial agents (such as secretory IgA and lysozymes).

REFERENCES

- Ahmadi Badi S., Bruno S. P., Moshiri A., Tarashi S., Siadat S. D., Masotti A. (2020). Small RNAs in Outer Membrane Vesicles and Their Function in Host-Microbe Interactions. *Front. Microbiol.* 11:1209. 10.3389/fmicb.2020.01209 - DOI - PMC - PubMed
- Akerman L., Casas R., Ludvigsson J., Tavira B., Skoglund C. (2018). Serum miRNA levels are related to glucose homeostasis and islet autoantibodies in children with high risk for type 1 diabetes. *PLoS One* 13:e0191067. 10.1371/journal.pone.0191067 - DOI - PMC - PubMed
- Bhardwaj N., Sena M., Ghaffari G., Ishmael F. (2020). MiR-4668 as a Novel Potential Biomarker for Eosinophilic Esophagitis. *Allergy Rhinol.* 11:2152656720953378. 10.1177/2152656720953378 - DOI - PMC - PubMed
- Hikkaduwa Withanage MH, Gomez Hernandez MP, Starman EE, Davis AB, Zeng E, Lieberman SM. (2021) Dataset – chemokines, cytokines, and biomarkers in the saliva of children with Sjögren's syndrome. *Data Brief* - PMC - PubMed
- Ilea A., Andrei V., Feurdean C.N., Băbțan A.M., Petrescu N.B., Câmpian R.S., et al. (2019) Saliva, a magic biofluid available for multilevel assessment and a mirror of general health-A systematic review. *Biosensors.* 9(1): 10.3390/bios9010027 - DOI - PMC - PubMed
- Mofors J., Arkema E.V., Bjork A. et al. (2019) Infections increase the risk of developing Sjögren's syndrome. *J Intern Med.* 285:670–80. - PubMed
- Sultan A.S., Kong E.F., Jabra-Rizk M.A. (2018) The oral microbiome: A lesson in co-existence. *PLoS Pathog.* 14(1):e1006719 10.1371/journal.ppat.1006719 - DOI - PMC - PubMed
- Sroussi H.Y., Epstein J.B., Bensadoun R.J., Saunders D.P., Lalla R.V., Migliorati C.A., et al. (2017) Common oral complications of head and neck cancer radiation therapy: mucositis, infections, saliva change, fibrosis, sensory dysfunctions, dental caries, periodontal disease, and osteoradionecrosis. *Cancer Med.* 6(12):2918–31. 10.1002/cam4.1221 - DOI - PMC - PubMed
- Shah S. (2018) Salivaomics: The current scenario. *J Oral Maxillofac Pathol.* 22(3):375–81. 10.4103/jomfp.JOMFP_171_18 - DOI - PMC - PubMed
- Vivino F., Bunya V.Y., Massaro-Giordano G., Johr C.R., Giattino S.L., Schorpion A., et al. (2019) Sjogren's syndrome: An update on disease pathogenesis, clinical manifestations and treatment. *Clin Immunol.* 22: 10.1016/j.clim.2019.04.009 - DOI - PubMed