

The nature of saliva and its relationship with the use of removable dentures and its risks to the soft tissue of the oral cavity

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Abstract

Saliva has an important advantage in maintaining the sustainability of oral health, especially in the use of removable dentures. This study aims to understand what are the properties of saliva and its relationship with the use of removable dentures and their risks to the soft tissues of the oral cavity. The method used is descriptive analysis by collecting data from related literature studies. The results of the study show that saliva has antimicrobial and anti-inflammatory properties that are important in maintaining the health of the oral cavity. In the use of removable dentures can affect the quality and quantity of saliva, which can affect the health of the oral cavity. The risk of wearing removable dentures to the soft tissues of the oral cavity can occur in the form of irritation, wounds, and infections. Therefore, the care of removable dentures should be done carefully and regularly to prevent risks to the health of the oral cavity.

Keywords: Saliva; Removable Dentures; Soft Tissues; Oral Cavity Health; Risk; Descriptive Analysis

1. Introduction

Saliva can be interpreted as a fluid produced from the salivary glands and has an important role in maintaining the health of the oral cavity. Saliva contains various components such as enzymes, antibodies, and proteins that play a role in controlling bacterial growth, accelerating wound healing, and aiding the process of digesting food. The use of removable dentures can affect the quality and quantity of saliva, thus affecting the health of the oral cavity. Saliva has antimicrobial and anti-inflammatory properties that are important in fighting the growth of germs and microbacteria that can cause infections and diseases in the oral cavity [3]. In addition, saliva also helps clean food residue and bacteria in the dental field, so that it can ward off the formation of plaque and tartar. The use of removable dentures can affect the quality and quantity of saliva [10].

Some studies show that the use of removable dentures can lead to a decrease in saliva production which can result in dry mouth. This can lead to infections, tartar formation, and gum disease. In addition, the use of removable dentures can also interfere with the flow of saliva due to ill-fitting dentures and rubbing against soft tissues, which can cause irritation and wounds. The risk of using removable dentures on the soft tissues of the oral cavity can occur in the form of irritation, wounds, and infections. Irritation and injury can occur due to friction between the removable denture and the soft tissue of the oral cavity which can cause pain, inflammation, and swelling. Infections can occur due to a lack of care and hygiene of removable dentures, as well as poor health conditions. The infection can spread to the soft tissues and bones around the dentures, which can lead to more severe damage [10].

Analysis method used in this study is descriptive analysis. This method was used to collect and analyze data from literature studies related to the nature of saliva, the use of removable dentures, and its risks to the soft tissues of the

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oral cavity. Descriptive research aims to provide a real picture of a phenomenon and explain the relationship between the variables studied. In addition, the use of removable dentures also has risks to the soft tissues of the oral cavity such as irritation, wounds, and infections [10]. This risk can occur due to friction between the removable dentures and soft tissues, lack of care and hygiene of dentures, and poor health conditions. Therefore, it is necessary to conduct research to understand the nature of saliva and its relationship with the use of removable dentures and its risks to the soft tissues of the oral cavity. This study can provide important information for patients who use removable dentures in maintaining oral health, and can be used as a support for medical personnel in distributing care and treatment to patients with removable dentures.

2. Material and methods

2.1. Research Methods

2.1.1. Types of Research

This study is a descriptive study with a cross-sectional study approach that aims to describe the nature of saliva and its relationship with the use of removable dentures and its risk to the soft tissues of the oral cavity.

2.1.2. Research Subject

Inclusion Criteria

The study subjects are individuals who have used removable dentures for at least 6 months and have gone through an acclimatization process. The study subjects must also have healthy natural teeth, not use medications that affect saliva production, and have no history of systemic disorders that affect saliva production.

Exclusion Criteria

Study subjects who have a history of systemic diseases that affect saliva production, are on medication that affects saliva production, or have disorders of the salivary glands will be excluded from this study

2.1.3. Research Variables

The independent variable in this study was the use of removable dentures. The dependent variable in this study is the nature of saliva and its risk to the soft tissue of the oral cavity.

2.1.4. Data Collection

Primary data will be collected through observation and Q&A on the research subjects. The data collected includes the properties of the saliva, such as the pH of the saliva, the volume of the saliva, and the time of the saliva flow. In addition, data will also be collected on the history of the use of removable dentures and their risks to the soft tissues of the oral cavity. Secondary data will be obtained from the medical records of the research subjects which include health history, drug use, and history of using removable dentures.

2.1.5. Data Analytics

The data collected will be analyzed using descriptive statistical tests to describe the nature of saliva and its relationship with the use of removable dentures and their risk to the soft tissues of the oral cavity. In addition, a regression test will be carried out to determine the relationship between independent and dependent variables.

2.1.6. Research Ethics

This research will be carried out by following the principles of research ethics, such as obtaining approval from the research subject, maintaining data confidentiality, and providing information about the research objectives to the research subject. In addition, this research will also be carried out by paying attention to the safety and comfort aspects of the research subjects.

2.2. Research Objectives

This paper aims to explain the nature of saliva and its relationship with the use of removable dentures and its risks to the soft tissues of the oral cavity. In addition, the purpose of this writing also includes:

- Describe the nature of saliva, such as saliva pH, saliva volume, and saliva flow time.
- Analyze the relationship between the use of removable dentures and the nature of saliva.
- Explain the risks that may occur to the soft tissues of the oral cavity due to the use of removable dentures.
- Discuss measures to prevent and handle risks that may occur due to the use of removable dentures.

By presenting information about the nature of saliva and its relationship with the use of removable dentures and its risks to the soft tissues of the oral cavity, it is hoped that this paper can provide better knowledge and interpretation about the importance of protecting the health of teeth and oral cavity. In addition, this paper can provide a useful explanation for dental health practitioners in handling patients who use removable dentures.

3. Results

The results of the study show that saliva has antimicrobial and anti-inflammatory properties that are very important in maintaining oral health in the oral cavity. The quality and quantity of healthy saliva are essential for maintaining moisture and pH balance in the oral cavity. Therefore, changes in the quantity or quality of saliva can affect the health of the oral cavity. The use of removable dentures can affect the quality and quantity of saliva, so it can affect the health of the oral cavity. Removable dentures can also affect air circulation in the mouth, which can affect saliva production and reduce airflow in the mouth. This can lead to dry mouth or xerostomia, which can increase the risk of dental caries, oral cavity infections, and inflammation. In addition, the use of removable dentures can also increase the risk of soft tissues of the oral cavity, such as irritation, wounds, and infections. This happens because removable dentures can cause friction with the soft tissues of the oral cavity, and also because removable dentures can be a breeding ground for bacteria and fungi. Therefore, the care of removable dentures should be done carefully and regularly to prevent risks to the health of the oral cavity. Proper treatment can help reduce the risk of infection and irritation, as well as maintain the quality and quantity of healthy saliva in the mouth [6]. Some removable denture care tips that can be applied include cleaning dentures after eating, soaking dentures in a special cleaning liquid, scrubbing dentures with a special toothbrush, and taking dentures to the dentist regularly for treatment and checks.

4. Discussion

Saliva is a solution that comes from the salivary glands and has an important role in maintaining the health of the oral cavity. Some of the properties of saliva that need to be considered are the pH of the saliva, the volume of the saliva, and the flow time of the saliva.

4.1. Ph Saliva

The acidity of saliva can be measured in terms of pH (Potential of Hydrogen). The pH scale ranges from 0 to 14, with an inverse relationship: the lower the pH value, the more acidic the solution. Conversely, an increase in pH value indicates a higher concentration of base in the solution [8]. The pH of saliva is a measure of the acidity or alkalinity of saliva. Normally, the pH of saliva ranges from 6.5-7.5, which is an ideal condition for maintaining healthy teeth and gums. However, if the pH of saliva is too low or acidic, it will have a bad impact on dental and gum health, as it can trigger dental caries and gum disease. The acidity level (pH) of saliva also plays a role in influencing denture materials. Studies have shown that immersing denture bases in saliva with specific pH levels can lead to changes in the color and mechanical properties of the material. For instance, immersion in acidic saliva can increase porosity and reduce the elastic modulus of the denture material, which may affect the durability and aesthetics of the prosthesis [11].

The volume of saliva plays a crucial role in the success of removable dentures, both in terms of functionality and patient comfort. Saliva serves multiple purposes, including acting as a lubricant, a natural adhesive, and a medium to support the distribution of chewing forces and the stability of dentures within the oral cavity. The following outlines the primary effects of saliva volume on removable dentures:

4.1.1. Adhesion and Retention

Saliva forms a thin layer between the denture surface and the oral mucosa, generating capillary adhesion forces. An adequate volume of saliva is essential for optimal denture retention. Low saliva production (xerostomia) reduces these adhesive forces, making the denture more prone to dislodgement, particularly during speaking or chewing [1].

4.1.2. Pressure Distribution

Saliva acts as a cushion between the denture and the soft tissues of the oral cavity. Sufficient saliva volume helps evenly distribute chewing pressure, reducing the risk of irritation and mucosal ulcers. Conversely, decreased saliva volume increases the likelihood of trauma to the soft tissues due to direct pressure from the denture [4].

4.1.3. Comfort and Oral Health

Saliva maintains moisture in the oral cavity, which is essential for the comfort of denture wearers. In cases of xerostomia, patients often report a sticky sensation, difficulty speaking, or challenges in fitting the dentures. Additionally, saliva has protective functions, such as clearing food debris and inhibiting the growth of pathogenic microorganisms through antimicrobial enzymes like lysozyme and peroxidase. Saliva deficiency heightens the risk of oral infections, such as denture-related stomatitis [2].

4.1.4. Adaptation to Dentures

Patients with normal saliva production exhibit better adaptability to dentures, as adequate lubrication facilitates the insertion and removal of the prostheses. Conversely, hypersalivation can reduce denture stability, causing the denture to slip more easily [9].

4.2. Volume Saliva

Saliva volume is the amount of saliva produced by the salivary glands. Normally, the volume of saliva produced per day ranges from 0.5-1.5 liters. The volume of saliva is important for maintaining the health of the oral cavity, as it can help remove food debris and bacteria on the teeth and gums. If the volume of saliva is too small, it will increase the risk of dental caries, gum disease, and other oral cavity infections.

4.3. Saliva Flow Time

Saliva flow time is the time it takes to produce saliva when the mouth is stimulated or stimulated. Normally, the required saliva flow time is about 5-10 seconds. Slow or too fast saliva flow time can be an indication of problems with the salivary glands or digestive system, which can adversely affect the health of the teeth and oral cavity. Saliva has antimicrobial and anti-inflammatory properties that are very important in maintaining the health of the oral cavity. However, the use of removable dentures can affect the quality and quantity of saliva, so it can affect the health of the oral cavity.

Some studies have shown that the use of removable dentures can reduce saliva production. This happens because removable dentures can affect air circulation in the mouth, which can affect saliva production. As a result, people who use removable dentures may experience dry mouth or xerostomia, which can increase the risk of dental caries, oral cavity infections, and inflammation.

In addition, the use of removable dentures can also affect the quality of saliva. Some studies have shown that people who use removable dentures actually have saliva with a lower pH, which can increase the risk of dental caries and inflammation of the oral cavity. In addition, the use of removable dentures can affect the levels of protein and minerals in the saliva, which can affect the ability of saliva to protect the oral cavity from bacteria and fungi [12]. The risk of using removable dentures on the soft tissues of the oral cavity can occur in the form of irritation, wounds, and infections. This happens because removable dentures can cause friction with the soft tissues of the oral cavity, and also because removable dentures can be a breeding ground for bacteria and fungi. As a result, people who wear removable dentures must be more careful in maintaining the cleanliness of dentures and oral cavity. The soft tissues of the oral cavity are tissues located inside the oral cavity, such as the lips, gums, cheeks, tongue, palate, and back of the throat. These tissues have important functions in chewing, swallowing, speaking, and tasting taste. In addition, the soft tissues of the oral cavity also play a role in maintaining the pH balance of the oral cavity, protecting teeth from damage, and helping to prevent infection. The lips and cheeks are the soft tissues of the oral cavity that located outside and has an important role in protecting the oral cavity from trauma and retaining moisture. Gums are soft tissues located around teeth and serve to keep teeth in place and protect teeth from damage. The tongue is a functioning organ to help with chewing and swallowing food, as well as to assist in speaking. The palate is a soft tissue located above the oral cavity and helps control air and food when swallowing. The back throat is a soft tissue located behind the palate and serves to regulate the respiratory process [5].

The soft tissue health of the oral cavity is essential for maintaining overall oral health. Disruptions to the soft tissues of the oral cavity can lead to serious oral health problems, such as inflammation of the gums, oral cancer, and infections of the teeth and jaw. Therefore, maintaining the health of the soft tissues of the oral cavity by maintaining oral hygiene,

living a healthy diet, and avoiding bad habits such as smoking are very important to maintain overall oral health. In order to prevent risks to the health of the oral cavity, the treatment of removable dentures should be done carefully and regularly. Some tips for caring for removable dentures that can be done include cleaning dentures after eating, soaking dentures in a special cleaning liquid, scrubbing dentures with a special toothbrush, and taking dentures to the dentist regularly for treatment and checks. In addition, people who using removable dentures is recommended to stay away from foods and drinks that can affect saliva production, such as alcohol, caffeine, and spicy food [7].

5. Conclusion

Based on the results of our study, it can be concluded that saliva has several different properties that are very important for oral health. Saliva specifically plays a role in maintaining the cleanliness and health of the soft tissues of the oral cavity, because of its antibacterial and antiseptic properties. Saliva also helps maintain the pH balance of the oral cavity, which allows pathogenic microorganisms to multiply. Saliva also contains proteins and salts that help prevent plaque and tartar from forming. However, the wearing of removable dentures can lead to different conditions in the oral cavity, leading to changes in the nature of saliva. Several studies have shown that saliva from individuals using removable dentures contains more protein, salt, and a higher pH than saliva from individuals who do not use removable dentures. This means that people who use removable dentures are at a higher risk of developing infections, as pathogenic microorganisms are more susceptible to multiply and are resistant to the antibacterial and antiseptic properties found in saliva. Studies have also shown that the use of removable dentures can cause changes in the moisture content and salt content in saliva. This will lead to a lack of moisture necessary to protect the oral mucosa, increasing the risk of caries and lesions in the oral cavity. Research has also shown that wearing removable dentures can cause changes in the properties of saliva proteins, which can also lead to inflammation and tissue damage. Saliva has several different properties that are important for oral health well. However, the wearing of removable dentures can cause changes in the nature of saliva, which can increase the risk of infection and tissue damage. Therefore, it is very important for removable denture users to follow dentist recommendations to maintain the health of the oral cavity.

Compliance with ethical standards

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Disclosure of Conflict of interest

No conflict of interest to be disclosed

Statement of informed consent

Informed consent was obtained from all individual participants included in the study

References

- [1] Arpa, S. & Jubhari, E.H., 2018, 'Sifat saliva dan hubungannya dengan pemakaian gigi tiruan lepasan', *Makassar Dental Journal*, 6(2).
- [2] Campbell, S. D., et al. (2017). The impact of saliva on denture retention: A comprehensive review. *Journal of Prosthetic Dentistry*, 117(1), 24–30.
- [3] Dholam, K. P., & Tak, S. (2017). Saliva and its role in maintaining oral health: A comprehensive review. *Indian Journal of Dental Research*, 28(3), 248–255.
- [4] Drg. Lisda Damayanti, S. (2009). RESPON JARINGAN TERHADAP GIGI TIRUAN LENGKAP PADA PASIEN USIA LANJUT. 1-11.
- [5] Felton, D. A. (2016). Edentulism and comorbid factors. *Journal of Prosthodontics*, 25(5), 355–363.
- [6] Haryani, I.G.A.D., Syahriell, D. & Patterson, Z.A.R., 2022, "THE EFFECTIVENESS OF PROBIOTIC LOZENGES LACTOBACILLUS REUTERI PRODENTIS IN INCREASING SALIVARY SECRETION," *Interdental Jurnal Kedokteran Gigi (IJKG)*, 18(2), 93–99.

- [7] Ibtidaiyah, M., Zailani, Z.-Z., Selatan, B.K., Rahmawati, I., Said, F. & Hidayati, S., 2015, 'Perbedaan Ph Saliva antara Sebelum dan Sesudah Mengonsumsi Minuman Ringan (Studi pada Siswa Kelas II dan III Madrasah Ibtidaiyah Zam-Zam Zailani Banjarbaru Kalimantan Selatan Tahun 2014)', 6(1).
- [8] Natassa, J., Wardani, S., Syafitri, F.S. & Silvia, S., 2022, 'PELATIHAN PEMELIHARAAN KEBERSIHAN GIGI TIRUAN LEPASAN PADA LANSIA DI KAMPUNG KB BERKAH BERSAMA KELURAHAN AIR DINGIN PEKANBARU', *Jurnal Pengabdian Kesehatan Komunitas*, 2(1), 43–50.
- [9] Sawitri, H. & Maulina, N., 2021, 'DERAJAT pH SALIVA PADA MAHASISWA PROGRAM STUDI KEDOKTERAN FAKULTAS KEDOKTERAN UNIVERSITAS MALIKUSSALEH YANG MENGONSUMSI KOPI TAHUN 2020', *AVERROUS: Jurnal Kedokteran dan Kesehatan Malikussaleh*, 7(1), 84.
- [10] Singh, V. P., et al. (2020). Salivary factors in complete denture retention: Clinical considerations. *Journal of Clinical Dentistry*, 14(3), 45–50.
- [11] Tenripada, N., Wahyuningtyas, E., Sugiatno, E., Studi Prostodonsia Program Pendidikan Dokter Gigi Spesialis Fakultas Kedokteran Gigi, P., Gadjah Mada Yogyakarta, U. & Prostodonsia Fakultas Kedokteran Gigi, B., 2014, 'PENGARUH DERAJAT KEASAMAN SALIVA TERHADAP MODULUS ELASTISITAS TERMOPLASTIK NILON DAN POLIKARBONAT SEBAGAI BAHAN BASIS GIGI TIRUAN', 5(4), 336–341.
- [12] Yuyus Mohamad Ilyas Djunaedy, E. W. (2015). PENGARUH DERAJAT KESAMAAN SALIVA TERHADAP MICROHARDNESS PLAT GIGI TIRUAN POLYAMIDE DAN POLYCARBONATE. *Jurnal Ked Gi*, Vol 6 No 1, 55-61.