Original Research

Measurement of pH level and uric acid in saliva before and after complete denture insertion

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ABSTRACT:
Background: Saliva is a clear and watery fluid that is produced by the salivary glands in the mouth. It plays an important role in the digestion of food and maintaining oral health. The present study was conducted to evaluate pH level and uric acid in saliva before and after complete denture insertion. **Materials & Methods:** 40 completely edentulous patients of both genders were divided into 2 groups of 20 each. Group I was age ranged 40-60 years contains two subgroups: group A1 for smokers and group A2 for non-smokers. Group II age ranged 61-80 years contains two subgroups: group B1 for smokers and group B2 for non-smokers. Prior to the placement of dentures, saliva samples from the participants were taken. The pH of the first container's saliva was estimated. Uric acid is estimated using a semi-automated clinical chemistry analyzer, and pH is estimated using a digital pH meter. **Results:** Out of 40 patients, males were 22 and females were 18. The mean pH of saliva before denture insertion was 6.6 and after denture insertion was 5.2. The difference was significant (P< 0.05). The mean uric of saliva before denture insertion was 4.8 and after denture insertion was 3.6. The difference was significant (P< 0.05). **Conclusion:** Salivary pH and uric acid levels in people who wear full dentures both significantly decreased.
Key words: denture wearer, pH, uric acid

INTRODUCTION
Saliva is a clear and watery fluid that is produced by the salivary glands in the mouth. It plays an important role in the digestion of food and maintaining oral health. Saliva contains various substances, including enzymes, electrolytes, mucus, and antibacterial compounds.[1] The production of saliva is mainly controlled by the autonomic nervous system, which operates involuntarily. Factors such as the presence of food, the smell or taste of food, and emotional or psychological stimuli can stimulate saliva production.[2]

The main antioxidant in saliva, uric acid, is clinically significant in assessing oral oxidative stress. Reactive oxygen species (ROS) and other highly reactive molecular species are produced in excess compared to the antioxidant defence mechanisms, and OS is a representation of this imbalance.[3] A denture's monomer release could be the source of harmful biological consequences like cytotoxicity and genotoxicity. These methacrylates have been found to alter genes in some cases. The oral cavity's cells' abilities to do certain tasks may be affected by resin monomers. Numerous studies have examined the effects of smoking and aging on salivary uric acid and pH, but none have examined changes in these levels in smokers who are entirely edentulous before and after wearing complete dentures from two different age groups.[4] The present study was conducted to evaluate pH level and uric acid in saliva before and after complete denture insertion.

MATERIALS & METHODS
The present study consisted of 40 completely edentulous patients of both genders. The written consent was obtained from all patients.
Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups of 20 each and each group was further divided into two groups of 10 each. Group I was age ranged 40-60 years contains

two subgroups: group A1 for smokers and group A2 for non-smokers. Group II age ranged 61-80 years contains two subgroups: group B1 for smokers and group B2 for non-smokers. Prior to the placement of dentures, saliva samples from the participants were taken. One month after the denture was put in, the subjects were summoned back so that their second round of saliva samples could be taken. The pH of the first container's saliva was estimated. A second container's saliva was utilized to estimate the amount of uric acid. Uric acid is estimated using a semi-automated clinical chemistry analyzer, and pH is estimated using a digital pH meter. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS
Table I Distribution of patients

Total- 40		
Gender	Males	Females
Number	22	18

Table I shows that out of 40 patients, males were 22 and females were 18.

Table II Estimation of saliva pH values before and after wearing complete dentures

| pH	Mean	P value
Pre- denture insertion	6.6	0.05
Post- denture insertion	5.2	

Table II shows that mean pH of saliva before denture insertion was 6.6 and after denture insertion was 5.2. The difference was significant (P< 0.05).

Table III Estimation of saliva uric acid values before and after wearing complete dentures

Uric acid	Mean	P value
Pre- denture insertion	4.8	0.02
Post- denture insertion	3.6	

Table III, graph I shows that mean uric of saliva before denture insertion was 4.8 and after denture insertion was 3.6. The difference was significant (P< 0.05).

Graph I Estimation of saliva uric acid values before and after wearing complete dentures
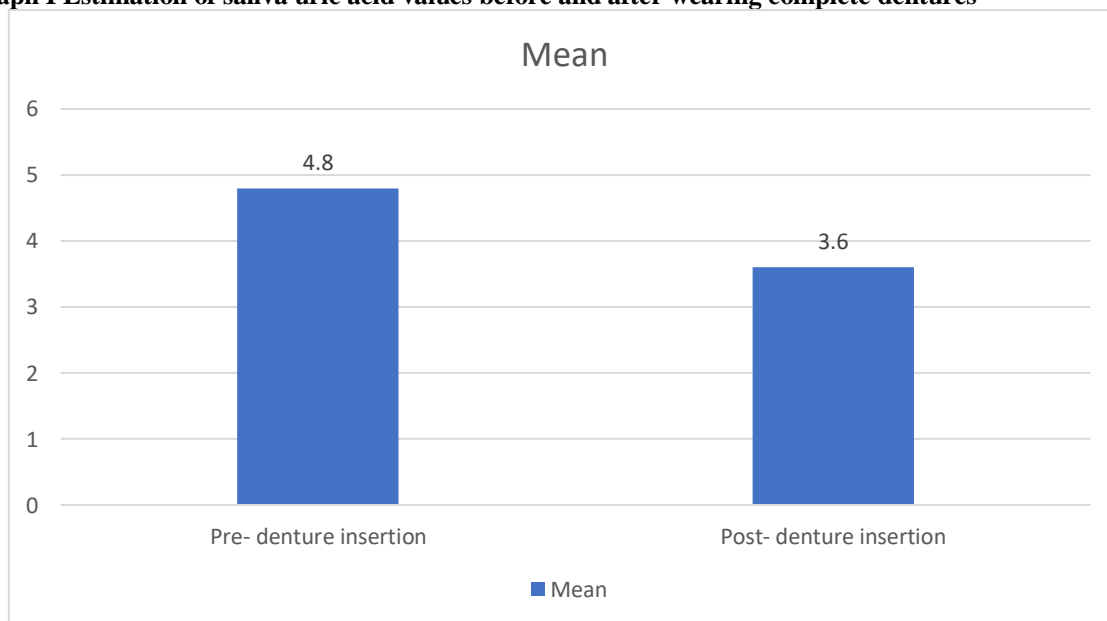
DISCUSSION
Three pairs of big glands and the smaller glands in the oral mucosa work together to make saliva. Taste, mastication, swallowing, and speaking all depend on saliva. Additionally, it preserves and safeguards the oral soft and hard tissues. Either stimulated or unstimulated (resting) secretion can be used to obtain saliva.[5] There are four ways to collect unstimulated saliva: draining, spitting, suction, and swabbing. The makeup of saliva is influenced by a variety of circumstances. Circadian rhythm dictates that the rate of secretion rises during the day and falls during sleep. These variables include flow rate, stimulation, age, diet, illnesses, medications, and hormones. Salivary pH varies from person to person. The typical range is 5.6 to 7.0, with 6.7 being the average.The

ability of saliva to act as a buffer protects the oral tissues from the pH's many influences.Saliva's pH before it is secreted into the mouth cavity is 6. Due to the loss of carbon dioxide, it becomes slightly alkaline upon expulsion from the gland.[6] High flow rates result in a higher pH because bicarbonate concentration rises with flow rate. The composition and pH of saliva vary as a result of the spontaneous loss of CO_2 after collection.As a result, the amount of time between collection and analysis affects the accuracy of various studies and pH.[7]

Saliva helps to lubricate the oral tissues, allowing the dentures to move smoothly and comfortably during speaking and chewing.[8] Adequate saliva production is important for minimizing friction and irritation between the denture and the gums.Saliva contributes to the retention of dentures by creating a thin film between the denture base and the oral tissues. This film of saliva helps to create suction, which aids in keeping the denture in place.[9] Insufficient saliva can result in decreased denture retention and stability.Saliva also contributes to the stability of dentures by enhancing their adherence to the underlying tissues. The moist environment created by saliva can improve the suction and adherence of the denture, reducing the chances of it becoming dislodged during normal oral activities.[10]The present study was conducted to evaluate pH level and uric acid in saliva before and after complete denture insertion.

We found that out of 40 patients, males were 22 and females were 18.Nikoloupoulo et al[11] measured variations in resting saliva pH in implant denture wearers before and after prosthetic treatment. Two sets of edentulous individuals who had never worn complete dentures before made up the study sample. Their ages ranged from 50 to 80. 60 patients made up the first group, all of whom were scheduled for total denture therapy. The second group included 15 patients who were scheduled for treatment with implant dentures. Each person's pH levels of unstimulated saliva were measured twice. Before and 15 days after the placement of complete dentures, the pH of the saliva was tested. The results of this investigation revealed notable statistical variations in the values of saliva's ($P< 0.001$).

We found that the mean pH of saliva before denture insertion was 6.6 and after denture insertion was 5.2. According to Duffo et al[12], the pH of saliva is a key factor in the corrosion of titanium implants. When implant sample were submerged in lower pH (5.2) as in chronic inflammatory processes (wine or drinks), a high corrosion was seen.

We observed that the mean uric of saliva before denture insertion was 4.8 and after denture insertion was 3.6. Sahu et al[13]measured the pH and uric acid levels in saliva before and after wearing full dentures. For the clinical investigation, 100 totally edentulous patients (aged between 40 and 80) are recruited. The 100 test subjects were split into two groups of 50 each, and within each group, there were two additional groups of 25. There are two subgroups within Group A (individuals between the ages of 40 and 60): group A1 for smokers and group A2 for non-smokers. There are two subgroups within Group B (aged 61 to 80): group B1 for smokers and group B2 for non-smokers. Saliva samples were taken, and the pH and uric acid levels were calculated. After wearing dentures for a month, it was discovered that salivary uric acid and pH had dramatically decreased. Age does not greatly affect pH.

The limitation of this study is small sample size.

CONCLUSION
Authors found that Salivary pH and uric acid levels in people who wear full dentures both significantly decreased.

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