



Influence of age and gender on salivary flow rate in completely edentulous patients

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Abstract

The denture retention and stability are dependent on saliva flow rate and quality, patients with dry mouth may have problems with the stability or comfort of maxillary complete dentures.

Dry mouth is a common feature in the elderly, but is not clear what proportion of incidences is related to functional disturbances and whether age and Gender play a role. The aim of this study is to determine the effect of age on unstimulated (Resting) whole and stimulated saliva flow rates. It was determined in 100 unmedicated, healthy individuals wearing complete dentures. The subjects were divided into two age groups: group A(< 70 years), group B(> 70 years). A significant decrease in the secretion rates of unstimulated whole saliva in relation to age was observed in the study population ($p < 0.001$).

Females had significantly lower mean flow rates than males for unstimulated (resting) whole saliva.

Key word: Complete denture, edentulous, salivary flow.

المستخلص:-

أن ثبات الطقم واستقراره يعتمد على نوعية اللعاب وسرعة جريانه . شخص بجفاف الفم يعاني مشكلة مع استقرار الطقم وثباته .

إن ظاهرة جفاف الفم هي من ظواهر الشيخوخة ولكن ليس هناك نسبة واضحة بين المسنين وهل أن هناك خلل وظيفي وهل لها علاقة بالعمر والجنس.

إن هدف هذه الدراسة هو لتحديد تأثير العمر و جنس المريض على معدل سيلان اللعاب بدون تحفيز الغدد اللعابية تم أخذ عينة مؤلفة من ١٠٠ شخص من الأصحاء بدنياً ويلبسون طقم كامل ولا يستعملون أدوية وتم تقسيمهم إلى فئتين عمريتين : (A) أكبر من ٧٠ سنة ، و (B) أصغر من ٧٠ سنة . تم تشخيص هبوط واضح في معدل إفراز اللعاب للأشخاص وبدون محفزات مع تقدم العمر ($p < 0.001$) وقد أتضح إن معدل سيلان اللعاب عند الإناث أقل من الذكور في الحالة الطبيعية (أي عدم استعمال محفزات لإفراز اللعاب).

Introduction

Saliva is a fluid secreted by three pairs of major salivary glands and many minor salivary glands which is normally found in oral cavity. It is a fluid which shows, like the other body fluids, some changes correlated with

some diseases. Saliva is regarded as one of the important factors in regulating oral health, with respect to both the volume produced and the constituents it contains⁽¹⁾.

Functional disturbances of the salivary glands can cause a reduction in salivary flow and subjective dryness which affect complete denture retention. As we know, the presence of thin salivary film layer is essential for the comfort of the mucosa beneath a denture base and for denture retention⁽²⁾. Although numerous studies on the properties and secretion of saliva have been published, the effect of aging on saliva flow remains unclear, a decrease in whole saliva flow with age and reduction in whole and parotid salivary secretion rate with age was reported^(3,4). Some of the variation in results might be due to the fact that "elderly" may be described as over 60 years of age in some studies and over 80 years in others. It appears that some studies may have included subjects on systemic medications^(5,6). A part from this conflicting observation of age-related changes in flow rates⁽⁷⁾.

The aim of this study is to determine whether there are age and gender – dependent changes in salivary flow rates of resting whole saliva in healthy completely edentulous patients receiving new pairs of complete dentures (immediately after the first wearing of the complete denture).

Materials and Methods

Hundred healthy newly wearing complete dentures elderly subjects were selected from prosthodontic clinic, each participant was given detailed and reassuring information as well as instruction on the purpose of the experiment, to dissipate apprehension and mental stress that may cause temporary mouth dryness by decreased salivary secretion to take part in this study. They were divided among the following two groups according to their age: group A (< 70 lesser than) and group B (> 70 greater than). Each patient has been asked

about name, age, address, social condition, hospitalization, medication, duration of disease, family history, habits like (smoking, alcohol). Environmental exposures were similar for all the subjects. (Patients has questioned according to health questionnaire of Boucher's, 1985).

Collection of Saliva Samples

All samples were taken between 9:00 and 11:00 am. Unstimulated whole saliva was collected from all subjects by direct expectoration into a sterile container over a period of 10 min. so that the flow rate could be calculated⁽⁸⁾. The flow rates of resting whole saliva were measured by volume and expressed as ml/min. The participants were kept as quite as possible to allow saliva flow into the mouth as normal as possible. All patients are seated in an armed dental chair with a standard head rest position with slight forward position of the head to prevent saliva swallowing and help in collection behind lightly closed lips. The patient was instructed to do initial swallowing to remove the excess of the deionized water (pre – sampling period was 1 min). Patients were asked to refrain from smoking, eating and drinking for 2 hours prior to the test session, to avoid swallowing and to make as few movements as possible during the procedure. Spitting method for collection of saliva samples was used. The participants were allowed to spit in large graduated test tubes. Then the tubes were covered well and held in crushed ice container for flow rate calculation⁽⁹⁾.

Results

* Saliva flow rate according to gender :

The mean and S.D for Saliva flow rate in sample (50 male) was $(0.4300 \pm 0.3700 \text{ ml/min})$ while for (50 Female)

was (0.03420 ± 0.02580 ml/min) as shown in table (2) and Fig (1).

* Saliva flow rate according to age:

The mean age and S.D in year of <70 years (50) was (0.5300 ± 0.21500 ml/min) while for >70 years (50) was (0.4200 ± 0.14400 ml/min) as shown in table (3) and Fig.(2) .

Discussion

Results of this study showed that Salivary flow in males was significantly higher than in females and this could be explained on the basis of that female Salivary glands being smaller than that , of male according to Scott (1975)⁽¹¹⁾ . Another factor contributing to this reduction of flow rate might be hormonal status in female and this agrees with Ship et al (1995)⁽¹²⁾ as they stated that women in post menapausal age had been reported to have a decreased Salivary flow rates , but this loss of estrogens would not be sufficient to account for reduced flow in female as Parvinen and Larmas (1982)⁽¹³⁾ suggested that , age is more important factor with respect to the parotid saliva flow rate .

Also results indicated that the change in flow rate of whole Saliva was related to age factor and this was in agreement with Al-Shimmary (2003)⁽¹⁴⁾ and Marton and Boros (2004)⁽¹⁵⁾ who measured the salivary secretion in 57 people aged between (50-60) years and found that the mean values were (0.19 ± 0.36 ml/min) and in 35 people aged between (59-75) years , the mean values were (0.36 ± 0.33 ml/min) , he found a correlation between the rate of secretion and age in the group of (50-75) years elderly people.

In conclusion, this study revealed that salivary flow in males was significantly higher than in females

and the change in flow rate of whole Saliva was related to age factor.

References

- 1- Baum BJ. Evaluation of unstimulated parotid salivary flow rate in different age groups . J. Dent Res. 1981; 60:1292.
- 2- Yurdukuru et al. Assessment of whole Saliva rate in denture wearing patients. J. oral Rehabilitation 2001; 38:109-112.
- 3- Heintze U, Birkhed D, Bjorn H. Secretion rate and buffer effect resting and stimulated Saliva as function of age and sex. Swed Dent. J. 1983; 7:227-238.
- 4- Helfm W, Baum BJ. Unstimulated and stimulated parotid salivary flow rate in individuals of different ages. J Dent Res. 1984; 63:1182-1185.
- 5- Gutman D and Ben H. The influence of the age on Salivary content and rate of flow. Int. J of oral surge. 1974; 3:314-317.
- 6- Makila E. Oral health among the in mates of old people's homes. The Salivary secretion , Proceedings of the finish dental society 37, 64. 1977.
- 7- Mandel ID, Wotman S. The Salivary secretions in health and disease. Oral science revue 1976; 8,25.
- 8- Narhi TO. et al. Association between Salivary flow rate and the use of systemic medication among 76, 81 and 86 year old inhabitants in Helsinki . Finland J Dent Res. 1992; 71:1875-1880.
- 9- Dawes C. Physiological factors affecting Salivary flow rate , oral sugar clearance, and the sensation of dry mouth in man. J Dental Res. 1987; 66:648-653.
- 10- Dodds M, Suddick R. Caries risk assessment for determination of focus and intensity of prevention in dental school clinic. J of Dental education 1995; 59:945-956.
- 11- Scott J. Age, Sex and contra lateral differences in the volumes of human submandibular Salivary glands. Arch Oral Boil 1975; 20:885.
- 12- Ship JA, Nolan NE, Puckett SA. Longitudinal analysis of parotid and submandibular Salivary flow rates in healthy different aged adults. J Gerontol Abiol Sci med 1995; 50:285-289.
- 13- Parvinen T, Larmas M. Age decency of stimulated Salivary flow rate , PH and Lactobacillus and yeast concentrations. J Dent. Res. 1982; 61:1052-1055.
- 14- Al-Shammary (2003): Some Saliva properties in dentate, edentulous and

denture wearers , Thesis for master degree.
15- Marton K, Boros I. Evaluation of unstimulated flow rates of whole and

palatal Saliva in healthy patients wearing complete dentures and in patients with Sjogren's Syndrom. J Prosthet. Dent. 2004 June; 91(6): 577-581.

Table (1): Unstimulated saliva flow rate determination Dodds and Suddik (1995)⁽¹⁰⁾

1.	The patient must not have had any type of Salivary stimulus during the preceding two hours ie: food , drink , gum , mint , dental treatment etc.
2.	The patient should sit quietly without any conversation or oral activity for six minutes , allowing any saliva to passively collect in the mouth .
3.	Every two minutes or so during this time the patient should spit into a small funnel leading into a small milliliter graduated cylinder .
4.	After six minutes measure the fluid , not the foam on top and record the volume .
5.	Divide the volume by six to determine the flow rate in milliliters / minute.

Table (2): Distribution of secretions rate of resting whole saliva (male and females)

Type	Gender	N	Mean	SD	Sig.
SFR	Male	50	0.4300	0.3700	0.000
	Female	50	0.03420	0.02580	H.S

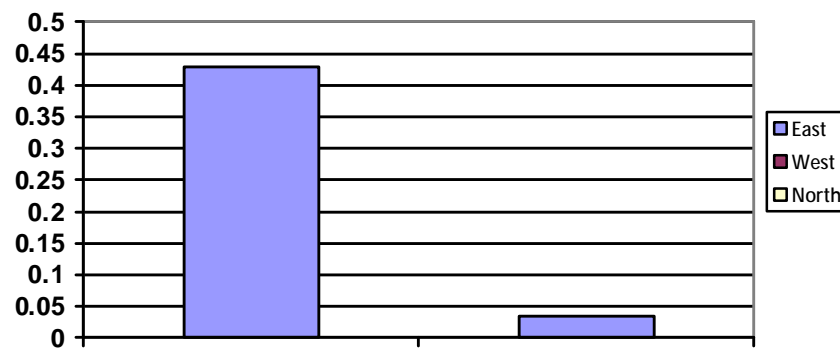


Figure (1) : Mean of saliva rate

Table (3): Distribution of age (years) for male and females of the Saliva flow rate

Type	Age groups	N	Mean	SD	F. value	Sig.
SFR	Male	50	0.5300	0.21500	52.315	0.000
	Female	50	0.4200	0.14400		H.S

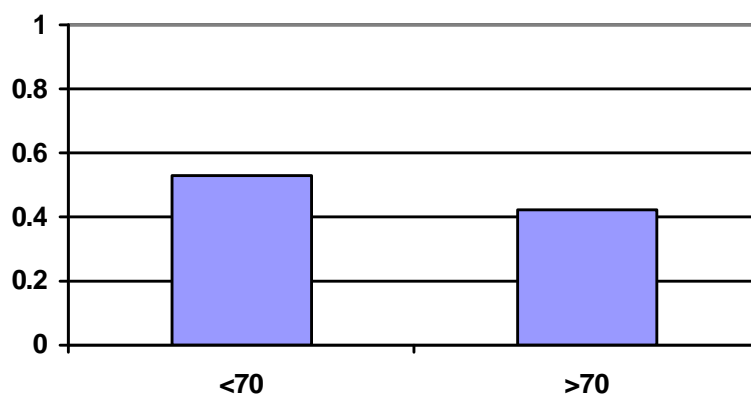


Figure (2) : Age group of the Saliva flow rate

Appendix
Sample of the Health
Questionnaire
Boucher's 1985

Name :

Age :

Sex :

Address :

Phone :

Occupation :

When was your last visit to your physician and why ?

Do you take Any medication (how much & why) ?

	كلا		نعم
	كلا		نعم
	كلا		نعم
	كلا		نعم
	كلا		نعم
	كلا		نعم
	كلا		نعم

١. تشرب ماء قبل الفطور صباحاً
٢. تمضغ الطعام ببطء
٣. هل اللقمة صغيرة
٤. هل تشرب الماء مع الطعام
٥. هل تشرب الماء بعد الطعام
٦. هل تشرب الماء قبل الطعام
٧. مرتاح بلبس طقم الأسنان