Original Research Article

Evaluation of the Effect of Xerostomia and Hyposalivation on Oral Health Related Quality of Life among Polymedicated Patients

ABSTRACT

Aim: To evaluate the effect of xerostomia & hyposalivation on oral health related quality of life among polymedicated patients.
Study Design: A descriptive cross sectional study.
Place and Duration of Study: Saliva samples were obtained from the participants and Questionnaires were answered in the Department of Oral Medicine & Radiology, Lenora Institute of Dental Sciences, Andhra Pradesh, from 12th Oct 2021 to 25th Nov 2021.
Methodology: A total of 62 polymedicated subjects who are regularly administered with any two of the following medications: anticonvulsants, antidepressants, oral hypoglycemics, antihypertensives, antihistamines for more than 1 year were randomly selected. The stimulated and unstimulated salivary flow rates of subjects were recorded using sialometry. The subjects further answered Oral Health Impact Profile Questionnaire (OHIP-14sp) and all the obtained values were analyzed using Spearman correlation test with a significant P value of 0.05 and SPSS version 23. **Results:** The presence of hyposalivation and xerostomia was observed in majority of the study population. Patients with hyposalivation revealed a mean score of 9.50±3.25 and 15.0 ± 6.8 with the OHIP and SXI questionnaires respectively, with a P value of .10 which was considered statistically significant.
Conclusion: The correlation of SXI and OHIP-14sp scores with the prevalence of xerostomia and hyposalivation suggests the need for preventive measures related to oral health among polymedicated patients.

Keywords: Hyposalivation, Oral health, Polymedication, Questionnaires

1. INTRODUCTION

Saliva is a biochemically complex fluid containing proteins, lipids, electrolytes, and buffers which play a vital role in maintaining the oral health. It preserves dentition, inhibits the growth of microorganisms, lubricates and protects the oral mucosa from trauma, and facilitates mastication, deglutition, and speech. [1] Hyposalivation and xerostomia are the most common features associated with polymedication. Consequently, the oral signs and symptoms of hyposalivation and xerostomia extend far beyond those of simple dryness, with a negative impact on patients' quality of life. [2]

The oral signs and symptoms of hyposalivation and xerostomia may exert a negative impact on patients' quality of life. [3] Thus, the present study was aimed to evaluate the effect of xerostomia & hyposalivation on oral health-related quality of life among polymedicated patientsowing to the increased use of polymedication in the population worldwide and the consequent effect on salivation.

2. MATERIAL AND METHODS

The study was conducted in the Department of Oral Medicine and Radiology, Lenora Institute of Dental Sciences, Rajahmundry, East Godavari district, Andhra Pradesh for a period of 2 months. The study protocol was approved by the institutional ethical committee, following the Helsinki rule of declaration, and informed consent was obtained from the participants. A pilot study was conducted andsample size was calculated by purposive sampling to determine the confidence level. A total of 62 polymedicated patients were included in the study that were regularly administered at least two of the following medications: anticonvulsants, antidepressants, oral hypoglycemics, antihypertensives, and H1

antihistamines and who were willing to participate in the study. Subjects under use of any medication other than anticonvulsants, antidepressants, oral hypoglycemics, antihypertensives and antihistamines or under irregular medication for the above mentioned conditions, with history of radiation therapy or chemotherapy and the subjects who were not willing to participate in the study were excluded from the study.The aim of this study was to evaluate the effect of xerostomia & hyposalivation on oral health related quality of life among polymedicated patients. Four objectives were formulated. The first objective was to assess the salivary flow rate among polymedicated patients. A second objective was to subject the patients to Oral Health Impact Profile and Summated Xerostomia Inventory questionnaires for evaluating the oral health quality. The third objective was to correlate prevalence of hyposalivation and xerostomia with oral health related quality of life among the subjects.
1% citric acid solution for the stimulation of saliva, graduated test tubes for measurement of saliva secretion, latex gloves and funnel were used for the saliva collection procedure. SPSS software version 23 was used for the data analysis.

2.1Methodology

All the subjects participating in the study have been explained about the study in their known language;Informed consent was obtained from the subjects and were asked to have breakfast 2 hours before the sample collection abstain from eating for 2 hours before sample collection. Saliva was collected using spit technique where the subject spits the saliva into a graduated test tube using a broad funnel. First, unstimulated saliva was collected and the subjects were instructed to spit in a sterile graduated test tube for one minute and the rate of unstimulated salivary flow was measured. Then, salivary flow was stimulated with 1% citric acid solution. Two drops of solution was poured onto the dorsum of the tongue and the patients were asked to swallow immediately. The patients were then instructed to spit in a sterile graduated container for the next one minute.(Figures 1 and 2)Hyposalivation was considered if the unstimulated salivary flow rate was <0.1ml/min and stimulated salivary flow rate was <0.7ml/min. [4]

Further, the subjects were asked to answer the Oral Health Impact Profile(OHIP-14sp) questionnaire which was given by University of North Carolina and the Summative Xerostomia Inventory questionnaire given by W.M Thomas and the responses were recorded accordingly. The short form of Oral Health Impact Profile questionnaire is the OHIP-14sp developed by Slade in the year 1997 which constitutes 14 questions which are divided into seven dimensions: functional limitation, physical discomfort, psychological discomfort, physical disability, psychological disability, social disability and handicaps which has validity, reliability and precession. Summative Xerostomia Inventory questionnaire comprises of five questions and the scoring is given in three categories.

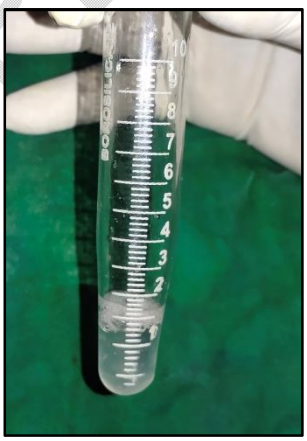


Figure 1: Graduated test tube showing normal salivation (>0.7ml stimulated saliva)

Figure 2: Graduated test tube showing hyposalivation (<0.1ml unstimulated saliva)

The obtained values were tabulated and statistically analyzed with SPSS software version 23.0 (IBM, Chicago, USA) using Spearman correlation test for correlation between xerostomia, hyposalivation and oral health related quality of life, where P<.05 was considered statistically significant

3. RESULTS

The sample included 62 subjects, among which 43% were males with a mean age of 44.18 years and 67% were females with a mean age of 38.72 years, and 33% were males with a mean age of 39.7 years which reflected a slight female predilection which was a similar observation to the study conducted by Joao Pedro et al. [9] and found a female predominance of 88.3% in the study population.

The prevalence of hyposalivation was 69.4% based on the unstimulated saliva and 56.5% based on the stimulated saliva in the study population. On observation of unstimulated saliva, hyposalivation was found in 43 subjects (69.4%) and on examination of stimulated saliva, hyposalivation was found in 35 subjects (56.5%).

The overall SXI-PL scores ranged from 2 to 8 with a mean of 7.95±3.87. The mean score of SXI-PL was higher in patients with hyposalivation (9.50±3.25). The results demonstrate a statistically significant correlation between SXI-PL scores and hyposalivation (*P*=.0126) (Table 1). The symptom that indicated higher severity of xerostomia was “My mouth feels dry”(73%), followed by “I have difficulty swallowing certain foods”(68%).

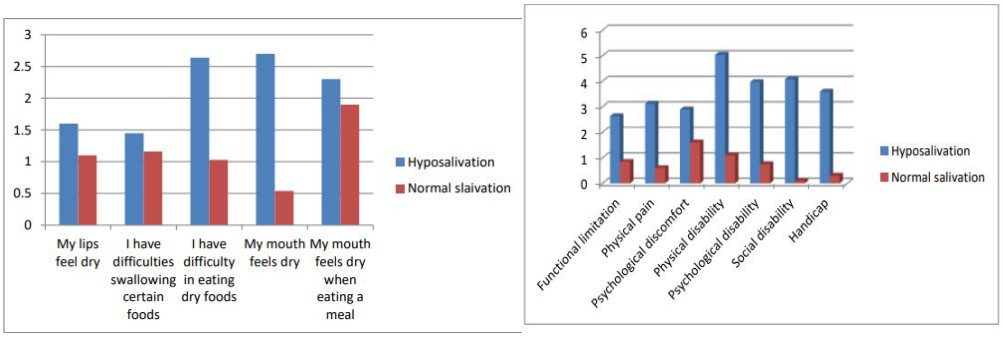
The overall OHIP-14sp scores ranged from 25 to 40, with a mean of (10.20 ±7.35). The mean score of OHIP-14sp was higher in patients with hyposalivation (15.0±6.8). The results demonstrate a statistically significant correlation between OHIP-14sp scores and hyposalivation (*P* = .061) (Table 1). The dimension of OHIP-14sp with higher impact was “Physical Disability”, with diet being unsatisfactory and having had to interrupt meals because of problems with teeth, mouth or dentures.

The correlation between OHIP-14sp mean scores and unstimulated saliva scores obtained a Rho value of -.705 and *P* value .021 and with stimulated saliva resulted in Rho value of -.661 and *P* value .010 which was considered statistically significant. The distribution of mean scores of SXI and OHIP symptoms for normal and hyposalivation have been depicted in the Figures 3a and 3b.

Table1: Distribution of mean scores of SXI-PL and OHIP-14sp for various salivary flow conditions.

Questionnaires	Hyposalivation	Normal salivation	Total	*P* value
SXI-PL	9.50±3.25	4.10±1.25	6.53±2.65	.0126
OHIP-14sp	15.0 ± 6.8	15.0 ± 6.8	5.40±9.60	.010

*p<0.05 was considered statistically significant.



(a) (b)

Figure3:(a) Distribution of mean scores of SXI-PL symptoms for various salivary flow conditions.

(b) Distribution of mean scores of OHIP-14sp symptoms for various salivary flow conditions.

3.1 Discussion

Salivary flow rate is altered with administration of various drugs like antidepressants, oral hypoglycemics, antihypertensives and antihistamines, etc. [5]But knowledge on the effect of drugs on salivary flow rate remains equivocal in spite of several studies which have been conducted in this regards. Hence, the present study investigated whether the salivary flow rate would be altered with the use of polymedication among patients and assessed the prevalence of xerostomia, which was conducted on the basis of limited evidence of studies investigating the effect of both xerostomia and hyposalivation on the oral health related quality of life especially among the Indian population.
Several studies which were done on salivary flow rate estimated hyposalivation in 60% of population. [6] The present study showed a significant decrease in salivary flow rate among 69% of the population. In various studies which are done to determine the association between xerostomia, hyposalivation and medications, significant association is seemed to be common. [2,4,8]

Studies done to assess the oral health-related quality of life appraised by OHIP-14 illustrate that physical disability components of the OHRQoL are the major problems associated with polymedication. [7]The present study illustrated that the dimension of OHIP-14sp with higher impact was “physical disability”. Thus, it was proved that hyposalivation also leads to social, nutritional and behavioral changes which not only affect the oral quality of life but also the general quality of life. Putten et al. [4] reported that the most severe symptom of xerostomia in a Dutch population was “my mouth feels dry” which was in accordance to the findings of Summated Xerostomia Inventory Questionnaire in the present study which showed a significant association was observed with the symptom “my mouth feels dry” among 73% of the subjects.

It has been proved that age could be a risk factor in developing xerostomia or dry mouth since people with old age have decreased salivary gland function due to atrophy of the salivary glands.[10] The findings of the present study justify this statement which showed increased hyposalivation and xerostomia among elderly people. Age may be a risk factor in and of itself; however medication use is a better indicator of xerostomia development.[11] The present study showed the prevalence of xerostomia and hyposalivation among elder and even the younger age groups under polymedication, which proves the effect of polymedication on patients regardless the age.

The importance of oral health education is further supported by Papanaioannou et al,[14] research, which demonstrates that individuals who have received it have better oral health compared to those who have not received any. This suggests that oral health education at a higher level aids in increasing theknowledge of oral health.[12,15] The simplified Xerostomia Inventory (SXI), a 5-item variant of the original questionnaire, was first published in 2011 [13] This was done because several XI questions probed beyond xerostomia alone, and also because a condensed form would be more practical for clinical application.

4. CONCLUSION

The present study suggests that, xerostomia and hyposalivation have an effect on oral health related quality of life.

Subjective feeling of dry mouth and objective salivary flow rate were independently associated with oral health related quality of life. The present study further revealed that, a decrease in resting saliva, high prevalence of xerostomia, have a negative impact on oral health related quality of life among polymedicated patients.

Continuous oral health education and preventive/interventional measures such as frequent drinking of water, fluoride application treatments should be promoted among polymedicated patients to prevent the occurrence of hyposalivation.

CONSENT

All authors declare that written informed consent was obtained from the patient (or other approved parties) for publication of this research work and accompanying images. A copy of the written consent is available for review by the Editorial office/Chief Editor/Editorial Board members of this journal.

ETHICAL APPROVAL

"All authors hereby declare that all experiments have been examined and approved by the appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki."

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