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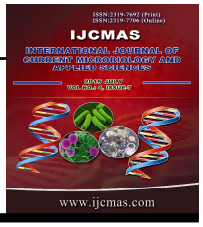

Original Research Article

Comparison of Oral Symptoms and Oral Mucosal Status in Xerostomia Patients and Healthy Individuals: A Study of 100 Subjects

Mohammad Shafi Dar[1*], Mohammad Ahsan Dar[2] and Suheel Hamid Latoo[1]

[1]Oral and maxillofacial Pathology, Govt. Dental College Srinagar, J&K, India
[2]Department of Ophthalmology, Hind Institute of Medical Sciences, Barabanki Road., U.P, India
**Corresponding author*

Keywords

Xerostomia patients, Oral symptoms and Oral mucosal status

A B S T R A C T

Objective of the study is to investigate the comparison of oral symptoms and oral mucosal status in xerostomia patients and healthy individuals. The study population included 100 subjects attending Babu Banarasi Das College of Dental Sciences Lucknow. After patient history and oral mucosal examination, major gland sialometry, and complementary tests, patients were divided into 6 groups: 1)Drug-induced salivary gland hypofunction (SGH), 2) Sjögren syndrome(SS), 3)Radiation-induced SGH, 4) Idiopathic SGH, 5) xerostomia without SGH, and 6) Control. The study population included 100 subjects: 25 male and 75 female. Alterations in Oral mucosal were more prevalent in all SGH groups than in the control group. Oral symptoms were also more frequent in all SGH groups. The post radiation group showed the highest frequency of oral mucosal alterations and of swallowing and mastication complaints. Individuals complaining of xerostomia (compared with those who did not) displayed lower major salivary gland flow rates and a higher frequency of oral mucosal alterations. Presence of oral mucosal alterations may help but are not enough to identify patients for further evaluation of SGH. Difficulties in mastication and swallowing are most specifically related to advanced SG.

Introduction

It is very critical to have normal salivary gland function for the maintenance of healthy oral mucosa, because saliva in the oral cavity provides protection owing to its cleansing, lubricating, and antimicrobial properties (Wolff *et al.,* 1990). Xerostomia (dryness of mouth) is usually caused by a decrease of at least 50% in unstimulated salivary flow rate (Sreebny and Swartz, 1986; Dawes, 1987) which can be followed and accompanied by oral soreness (Navazesh *et al.,* 1992) and burning sensations, difficulty in mastication (Gerdin *et al.,* 2005), swallowing (Rhodus *et al.,* 1995), and speech (Articulatory speech performance, 1995), and altered or diminished taste perception (Rose-Ped *et al.,* 2002). Devastating effects on oral health due to salivary gland hypofunction and may signal the presence of serious underlying

systemic diseases. A wide variety of pathologic alterations of soft and hard tissues has been associated with SGH (Sreebny and Swartz, 1986; Greenspan, 1983; Chen and Daly, 1980). These may be accompanied with Laryngeal, nasal, and ocular dryness (Shearn, 1971).

The most widely recognized reason for salivary gland hypofunction are Sjögren syndrome (SS), radiotherapy to the head and neck region, and the use of some medications (Sreebny and Schwartz, 1997; Schubert and Izutsu, 1987; van den Berg *et al.*, 2007).

Earlier, many studies have described the possibility of mucosal impairment resulting from SGH (Greenspan, 1983; Fox *et al.*, 1985). However, very few studies have directly examined the nature and extent of such alterations in relation to salivary gland function. Wolff *et al.* (1990) investigated the correlation between oral mucosal health and salivary gland flow rates in 1990 and failed to find a direct relationship between salivary output and mucosal status. The purpose of the present study was to investigate the association of oral symptoms and oral mucosal status with salivary flow rates.

Materials and Methods

The study subjects consisted of 100 patients attending BabuBanarasi Das College Of Dental Sciences Lucknow over a 3-year period. Patients signed a written consent form. Patients' personal records included a questionnaire with demographic and social information, past medical history, information on medications used, smoking and drinking habits, and oral complaints, particularly those related to xerostomia.

Other than these detailed physical examination was performed which included head and neck examination and oral mucosal and dental status. Consistency in diagnosis was ensured by using the same structured questionnaire over the 3-year period of the study. Patients were classified on the basis of their oral mucosal clinical presentation into 1 of the following 6 categories:

1) Drug-induced salivary gland hypofunction (SGH),
2) Sjögren syndrome(SS),
3) Radiation-induced SGH,
4) Idiopathic SGH,
5) Xerostomia without SGH, and
6) Controls

Results and Discussion

Distribution of patients and Demographic characteristics in diagnostic groups

The study population included 100 subjects: 25male and 75 female in the ratio of 1:3. The age range was 15–90 years, mean 60 years. Eight subjects were assigned to the control group: 4 males and 4 females, M:F ratio 1:1, age range 16–86 years. Mean 55 years. 07 were diagnosed as post-radiation SGH, 10 as idiopathic SGH, and 30 as xerostomia without SGH, Twenty five patients were diagnosed as drug-induced SGH, and twenty as sjogren syndrome (SS).

Status of oral mucosa

Comparison of mucosal status between diagnostic groups is presented in table 1.

There were significant differences between the groups in the frequency of mucosal changes (P _ 0.02). Overall frequency of subjects showing oral mucosal alterations was predominant among the radiated patients (85.8%). The SS group and the medicated group showed similar frequencies of oral mucosal alterations (80% each),

whereas the idiopathic SGH and control groups had the lowest frequencies of oral mucosal changes.

Frequency of oral symptoms

Comparison of oral symptoms between diagnostic groups is presented in table 2.

Comparison of the frequency of most patient-reported symptoms (dry mouth perception, sore mouth, mastication and swallowing impairment) between the diagnostic groups revealed significant differences between the groups (Table 2). Oral soreness was reported most frequently among SS patients, whereas post-radiation patients were the group complaining most frequently about mastication and swallowing impairment. Most symptoms (except oral soreness) were less frequent in the medicated group than in both SS and radiation groups but more frequent than in the control group.

Normal salivary gland function is considered to be critical for the maintenance of oral homeostasis and healthy oral mucosa.[1] predisposition of the oral mucosa to pathologic alterations is generally accepted due to salivary gland hypofunction (Greenspan *et al.,* 1983; Janket *et al.,* 2007). Still at present era measurement of salivary flow rates is considered as most important tool for evaluation of salivary gland hypofunction (SGH).

In the present study, a detailed analysis of individual glands, parotid, submandibular and sublingual under resting and stimulated conditions, was performed, and association with symptoms and condition of the oral mucosa was investigated. A number of pathologic alterations have been revealed in sjogrens syndrome (SS) patients and in patients after radiotherapy to the head and neck (Fox *et al.,* 1987; Scully *et al.,* 1986; Fox *et al.,* 1998; Silverman, 1999). In the present study, the drug-induced hyposalivation group was quite heterogeneous and not subdivided in terms of type, dose, or duration intake of the medications. Similarly, the post– head and neck radiation group were not stratified according to parameters such as dose, location, portals of the radiotherapy, years since completion of the treatment, and specific exposure of parotid and submandibular/sublingual glands. The purpose of the present study was to investigate the association oral symptoms, oral mucosal status in xerostomia patients and healthy individuals. In the present study results revealed and confirmed that a higher frequency of mucosal changes was indeed found in patients with measurable SGH of the major glands. However, at the same time more than half of the control subjects also showed some type of oral mucosal changes, suggesting that normal flow saliva is only one of a variety of factors that are needed to preserve the integrity of healthy mucosa. In an earlier study, Wolff *et al.* (1990) evaluated alterations of oral mucosa in an American patient cohort in relation to salivary gland function and failed to find severe mucosal alterations as a result of SGH. Factors which have been suggested to contribute for the preservation of integrity of healthy mucosa even in significant salivary hypofunction of major salivary glands include 1, normal secretion from minor salivary glands, 2, intrinsic defense mechanisms of the oral mucosa, or 3, a oral microbial balance which helps in preventing growth of pathogenicspecies (Wolff *et al.,* 1990; Sreebny *et al.,* 1989).

In the present study frequency of other oral symptoms was seen higher in SS and post radiation patients compared with the control group and similar toother groups with SGH, such as soreness (similar infrequency to the radiation and idiopathic SGH groups),

mastication impairment (similar to idiopathic SGH), and swallowing impairment (similar to SS group). There are a number of possible reasons for the perceived dryness in the absence of major gland hypofunction 1) unstimulated parotid flow rate, 2) Minor salivary gland function, which has not been assessed in this study, Tabak *et al.* (1982) have emphasized the prominent role in oral lubrication plaid by mucins, 70% of which are secreted by minor salivary glands. 3) Changes in chemical composition or physical characteristics of saliva.

Table.1 Comparison of mucosal status between diagnostic groups

Group	Normal mucosa N (%)	Oral mucosal alterations N (%)
Medicated (N=25)	05 (20%)	20 (80%)
SS (N=20)	04 (20%)	16(80%)
Radiation (N=07)	01 (14.2%)	06 (85.8%)
Idiopathic (N=10)	04 (40%)	06 (60%)
Xerostomia (N=30)	09 (30%)	21 (70%)
Control (N=08)	03 (37.5%)	05 (62.5)

Table.2 Comparison of oral symptoms between diagnostic groups

Group	*Dryness N*	*Soreness N*	*Speech impairment*	*Mastication impairment*	*Swallowing impairment*
Medicated (N=25)	20 (80%)	6 (24%)	2(08%)	6(24%)	5(20%)
SS (N=20)	18(90%)	7(35%)	3(15%)	8(40%)	8(40%)
Radiation (N=07)	6(86%)	1(14%)	1(14%)	4(57%)	5(71%)
Idiopathic (N=10)	8 (80%)	2(20%)	1(10%)	2(20%)	2(20%)
Xerostomia (N=30)	30(100%)	7(23%)	2(6.6%)	3(10%)	4(13%)
Control (N=08)	0 (0%)	1(12.5%)	1(12.5%)	1(12.5%)	1(12.5%)
Pearson chi-square	P<0.001	P<0.02	NS	P<0.001	P<0.001

Further investigation is required in order to find other multiple factors associated with xerostomia when salivary flow is apparently normal. Sore mouth or pain is a possible complication of dryness, (Longman *et al.*, 1996) though it is not considered only one or major one. Within the groups in the present study, painful or sore mouth was reported most frequently by SS patients (35%) and the medicated group (24%) but only in 14% of the radiation group, in which salivary gland function was the lowest.

In the present study, mastication and swallowing impairment were reported more predominant in xerostomia affected groups than in healthy individuals thus confirming that these impairments can also help in assessing salivary gland hypoplasia (SGH). Furthermore, the particularly high frequency of mastication and swallowing difficulties in the most severely affected groups (radiation and SS) may suggest those symptoms as an important tool to assist clinicians in the detection of advanced SGH. On the other

hand, speech impairment appeared to be less specific, because there was no significant difference among all groups.

Higher frequency of alterations of the oral mucosa was seen in Patients with SGH than healthy individuals. The presence of these findings together with xerostomia-related complaints may help to identify patients for further evaluation of salivary gland functions. Symptoms of soreness and difficulties in mastication and swallowing are most specifically related with SGH, whereas speech impairment is a nonspecific complaint. Complaints of mastication and swallowing impairment may indicate the existence of advanced SGH.

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