

Prevalence of self-reported xerostomia in a cross-sectional population in the western province of Saudi Arabia

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تم تحديد مدى انتشار وحدوث ظاهري جفاف الفم في الكثير من أقطار العالم. ولا يوجد معلومات موثقة عن نسبة حدوث ظاهرة جفاف الفم في المجتمع السعودي. هذه الورقة تصف حدوث هذه الأعراض والعوامل المصاحبة في المنطقة الغربية من السعودية حيث يكون الطقس شديد الحرارة والرطوبة في معظم أيام السنة. تم توزيع استبيان في المنطقة الغربية من السعودية وتم استلام ردود مجموعها ٥٥٢ رداً وتم تحليلها. أظهرت النتائج أن حدوث ظاهرة جفاف الفم كان مقارباً لما هو عليه مختلف أنحاء العالم والتي فيها حالة الطقس مختلفة. وحسب ما هو عليه في التقارير الأخرى أظهرت نتائجنا توافقاً مع الدراسات الأخرى الفموية وغير الفموية والتي سببها استعمال الأدوية والعادات الفموية الضارة مثل التدخين ومضغ التبناك.

The prevalence and incidence of xerostomia has been determined in many countries of the world. No data is available on a prevalence and incidence of xerostomia in any Saudi Arabian Population. This paper describes incidence of this symptom and associated factors in the western region of Saudi Arabia – a country with very hot and dry climate throughout most of the year. A questionnaire survey was conducted in the western region of Saudi Arabia. A total of 552 responses were received and analyzed. Results showed that the incidence of xerostomia was comparable to those reported from different parts of the world with different climatic conditions. In accordance with other reports, our results also showed an association with other oral and non-oral symptoms, the use of certain medications and mouth habits such as cigarettes and tobacco use.

INTRODUCTION

The perceived feeling of oral dryness is known as xerostomia. This sensation may occur in the presence or absence of salivary gland hypofunction.^{1,2} The most frequent causes of dry mouth include the use of certain drugs, autoimmune diseases such as sicca syndrome, Sjogren's syndrome and irradiation of the salivary glands.

Dry mouth has been associated with several oral symptoms and signs such as burning sensation of the oral mucosa and the tongue, difficulties with swallowing, speech disorder, difficulty in eating dry food and alteration of taste.^{3,4}

The prevalence of xerostomia varies in different age groups and populations all over the world. Most of the reported studies in the literature were conducted on institutionalized or aged population.⁵⁻⁷ However, Sreebny *et al.*^{3,8} showed that dry mouth could be found in all age groups

and that the symptoms of oral dryness is a valid indicator of salivary gland hypofunction.

Saudi Arabia is a country with a very hot climate most months of the year. In the western region, the weather is mostly hot and could be very humid. It is therefore conceivable that the perceived feeling of oral dryness may be more rampant in the Saudi Arabian population than in the temperate regions of the world.

The objectives of this study were to determine (1) the incidence of oral dryness in different age-groups of the adolescent and adult Saudi Arabian populations; (2) the relationship between oral dryness and other selected oral and non-oral symptoms as well as the use of medications.

MATERIALS AND METHODS

Subjects

The subjects were drawn from a pool of university students who

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were conveniently selected. Each student received information on the questionnaires and acted as the source of information collection from members of their families who were aged 18 years and above. One hundred and twenty students were recruited but only 95 returned the questionnaires.

Questionnaire

The questionnaire contained specific questions adapted from previously used questionnaires¹⁻⁴ and included the biodata of a respondent such as age and sex, the presence of selected oral and non-oral symptoms,³ the intake of drugs and medications and the presence of systemic diseases. The selected oral and non-oral symptoms were based on the study by Sreebny and Valdini³ and included the following: oral dryness, the need to consume fluid regularly, difficulty with masticating and swallowing dry food, difficulty with speech, and burning sensation in the mouth. Others questions were on dryness of the eye, throat, nasal cavities, skin and genital area, recurrent genital and oral infections, constipation and mouth breathing. Respondents were categorized into 2 groups: xerostomia and non-xerostomia based on their answers to the questions "Does your mouth feel dry constantly?"⁷

Statistical Methods

The data was analyzed with the SPSS package for descriptive statistics. Contingency table analysis was used to test association among different variables. Differences between 2 parameters and groups were tested with Chi-square test. Significance level was set at 5%.

RESULTS

The results showed that about 23% of the subjects in the studied population reported the feeling of oral dryness

with no sex differences (Table 1). The prevalence increased significantly with age from about 12.5% in the 18-29 age group to 33% in the age group above 50 years (Table 2). About 20% of subjects had the symptoms for 6 years or more (Fig. 1). Of the selected drugs, only analgesics, vitamins and minerals were not positively correlated to xerostomia (Table 3). Results also showed significant differences between the two groups in many of the selected oral and non-oral signs and symptoms (Table 4).

Table 1. Prevalence of xerostomia according to gender

Gender	Yes (%)	No (%)	Total (%)
Female	60 (20.4)	234 (79.6)	294 (100)
Male	68 (26.4)	190 (73.6)	258 (100)
Total	128 (23.2)	424 (76.8)	522 (100)

P<0.15

Table 2. Prevalence of dry mouth according to age

Age	Yes (%)	No (%)	Total (%)
18 - 29	20 (12.5)	140 (87.5)	160 (100)
30 - 39	36 (23.4)	118 (76.6)	154 (100)
40 - 49	39 (28.3)	99 (71.7)	138 (100)
Above 50	33 (33.0)	67 (67.0)	100 (100)
Total	128 (23.2)	424 (76.8)	522 (100)

P<0.0001

DISCUSSION

Most studies on xerostomia have been carried out on community-dwelling or institutionalized adults.^{5,9-13} These reports have shown that the prevalence of xerostomia ranged from about 10% among 50 year olds to 40% in people aged 65 years and above. Very few studies and data are available for people under age 50 years especially in very young populations.^{3,8} The present study was a cross-sectional evaluation of prevalence of self-reported symptoms of xerostomia

Table 3. Comparison of xerostomic and non-xerostomic patients and use of medications

Symptoms	Xerostomia			Non-Xerostomia			P value
	Yes	No	Total	Yes	No	Total	
Antihistamines	22 (17.2)	106 (82.8)	128	31 (9.0)	313 (91)	344	0.05
Anti Obesity	8 (6.35)	120 (93.7)	128	6 (1.7)	338 (98.3)	344	0.006
Analgesics	60 (46.9)	68 (53.1)	128	153 (44.5)	191 (55.5)	344	0.2
Vitamins	29 (22.7)	99 (77.3)	128	82 (23.8)	262 (76.2)	344	0.3
Minerals	12 (9.4)	116 (90.6)	128	18 (5.2)	326 (97.8)	344	0.3
Hyperglyceamic	24 (18.8)	104 (81.2)	128	10 (2.9)	334 (97.1)	344	0.001
Anti-hypertensive	30 (23.4)	98 (76.6)	128	8 (5.2)	326 (94.8)	344	0.001
Diuretics	28 (21.9)	100 (78.1)	128	10 (2.9)	334 (97.1)	344	0.001

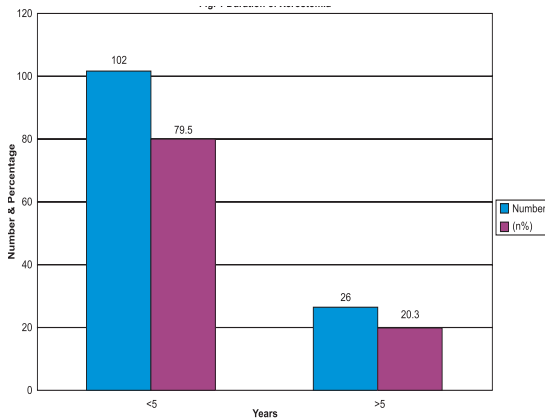


Fig. 1. Duration of xerostomia

in a wide age- range from 18 years old adolescents to adults 50 years of age and above.

The prevalence of xerostomia in this study was 23.2%, which is comparable to reports on fairly similar age groups from other parts of the world with different climatic characteristics. Nederford *et al.*¹⁴ reported a prevalence figure of 21.3% and 27.3% for Swedish men and women respectively aged between 20 - 80 years of age. Billings *et al.*¹⁵ also reported a prevalence of 18% and 24% among men and women, respectively in their study of

Table 4. Comparison of reported symptoms in xerostomia and non-xerostomic patients.

Symptoms	Xerostomia				Non Xerostomia				P Value
	Yes	No	Unsure	Total	Yes	No	Unsure	Total	
Feeling thirsty	82 (64.1)	38 (29.7)	8 (6.5)	128 (100)	56 (16.5)	262 (77.1)	22 (6.5)	340	0.0001
Mouth moisture use	62 (49.2)	64 (50.8)	-	126 (100)	47 (13.9)	291 (86.1)	-	338	0.0001
Drinks beside bed	58 (46)	68 (54)	-	126	65 (19.7)	265 (80.3)	-	330	0.0001
Dry when speaking	60 (47.2)	46 (16.5)	1 (16.54)	127	47 (14)	260 (77.2)	30 (9)	337	0.0001
Difficulty in swallowing	35 (27.8)	78 (61.9)	13 (10.3)	126	11 (3.3)	310 (91.7)	17 (5)	338	0.0001
Mouth breathing	54 (42.9)	72 (54.1)	-	126	70 (20.6)	270 (79.4)	-	340	0.0001
Burning tongue	24 (19.1)	90 (71.4)	12 (9.5)	126	9 (2.64)	315 (92.4)	17 (5)	341	0.0001
Dry throat	62 (50.4)	14 (34.2)	19 (15.5)	123	43 (12.8)	264 (78.3)	30 (9)	337	0.0001
Dry nose	49 (39.8)	65 (52.9)	9 (7.3)	123	56 (16.6)	266 (78.7)	16 (4.7)	338	0.0001
Dry nkin	51 (41.5)	66 (53.7)	6 (4.9)	123	97 (28.8)	216 (64.1)	24 (7.1)	337	0.0001
Constipation	42 (33.9)	3 (58.97)	9 (7.3)	124	5 (19.23)	254 (75.2)	19 (5.6)	338	0.0003
Cigarette/Tobacco	33 (27.5)	87 (72.5)	-	120	44 (13.3)	287 (86.7)	-	331	0.0002
Eye dryness	29 (23.4)	87 (70.2)	8 (6.5)	124	27 (8.6)	294 (87.8)	14 (4.2)	335	0.0001

710 adults aged 19 - 88 years of age in New York area of USA. Therefore, climatic differences may not play a major role in the feeling of oral dryness.

In this study there was no significant difference in prevalence rates between male and females. This however is in contrast to many studies which reported a significantly higher prevalence among women.^{7,14,15} Billings observed that this difference became apparent after 50 years of age. Our study covered a much younger age group than most of these studies and may have accounted for the lack of difference between the sexes at this age range.

The relationship between increasing age, salivary gland hypofunction and xerostomia has also been well documented. Many studies, including the present report, suggested an increase in xerostomia with age although there is controversy as to whether there is concomitant reduction in salivary secretion with age.¹⁶⁻¹⁸ According to Sreebny,² it is doubtful whether this age effect may be sufficient to induce xerostomia. Dawes¹⁹ suggested that salivary flow rate has to be reduced by 50% before the feeling of oral dryness could occur. We observed a significant increase in prevalence with age ranging from 12.5% in the 12 - 29 age group to 33 % in the 50 year olds. About 80% of the xerostomic subjects reported a duration of 5 years and below, with the remaining 20% reporting a duration of 6 years and above.

A comparative analysis of selected oral and non-oral symptoms showed that there were significant differences between xerostomic and non-xerostomic subjects. Xerostomia was strongly associated with oral symptoms such as feeling thirsty, keeping mouth moist constantly, keeping fluid by the bedside for night use, difficulty in speech and swallowing, mouth-breathing, recurrent oral infections and

burning sensation of the tongue. This accords with many studies, which showed that these symptoms could be used for diagnostic criteria of oral dehydration and salivary gland hypo-function.^{3,8} However, Dawes¹⁹ opined that the sensation of dry mouth could be triggered by localized areas of dryness since saliva wetting varies from site to site. Therefore, while dry mouth often results from salivary gland hypofunction, it could also be felt by subjects with apparently sufficient amount of saliva.⁷

The use of certain drugs had also been associated with xerostomia. In the present study, the feeling of oral dryness was strongly associated with anti-histamines, anti-obesity, anti-hypertensive, diuretics and hypoglycemic drugs but not with the use of vitamins, minerals and analgesics. We also observed a significant association with the use of cigarette and tobacco.

It was interesting to note that none of those who reported the feeling of oral dryness had actually gone for dental consultation for the condition. This may be due to the fact that in most cases it is not a serious condition as such and subjects can manage the condition on their own. However, as the oral effect of containing oral dehydration may not be known to most people, it is essential that the dental profession includes this symptom in public dental education program for all communities.

CONCLUSION

Xerostomia is a relatively common symptom among a convenient population of 18-50 year old subjects studied in Jeddah Saudi Arabia affecting 1 in every 5 subjects. The prevalence increased with age with no significant sex differences. It is also strongly associated with many oral, non-oral conditions, symptoms and social habits such as the use of cigarettes and tobacco.

Despite this prevalence, none in the xerostomic group had reported dental consultation and management. An awareness dental education program is recommended in all ages and communities.

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