

Prevalence of oral mucosal lesions in elderly people in Santiago, Chile

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Abstract

Background: Oral prevalence studies are important to know the state of health and the needs of treatment. Our aim was to determine the prevalence of oral mucosal lesions and associated factors among aging Chileans.

Methods: A random sample by age, gender, and socioeconomic status was obtained, comprising 889 individuals older than 65 years. Individuals were interviewed and examined in Santiago, the capital of Chile, according to the World Health Organization guidelines.

Results: The prevalence of one or more oral mucosal lesions in the sample was 53%. Logistic regression model revealed that denture use increased the probability of one or more oral mucosal lesions by threefold, while age, gender, smoking, medication use, xerostomia, and social or cultural factors had no effect. The most common lesion was denture stomatitis (22.3%), followed by irritative hyperplasia (9.4%), oral mucosal varicosities (9%), solitary pigmented lesions (4%), traumatic ulcer (3.5%), angular cheilitis (2.9%), multiple pigmented lesions (2.8%), hemangioma (2.3%), lichen planus (2.1%), leukoplakia (1.7%), recurrent aphthous stomatitis (1.4%), nicotine stomatitis (1.3%), median rhomboid glossitis (0.9%), actinic cheilitis (0.9%), pyogenic granuloma (0.7%), oral squamous papiloma (0.6%), and mucocele (0.2%). One case of oral cancer was observed. Different factors increased the probability of specific oral mucosal pathologies.

Conclusions: We can conclude that oral mucosal lesions are common in elderly people in Santiago, suggesting the necessity for improved standards of prevention, and diagnostic and opportune treatment of these lesions.

Key words: epidemiology; oral; oral mucosal lesions; prevalence

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Oral health survey data are essential for governmental decisions about dental care and prevention programs. Data on oral mucosal lesions in adults in Chile are scarce, only one epidemiological survey of oral mucosal lesions has been published (1963), but this describes only oral anomalies (1). The present survey was undertaken to assess the prevalence of oral mucosal lesions among citizens of Santiago older than 65 years. Age, gender, smoking, medical status, medication, use of denture, xerostomia, and social or cultural factors were associated with the prevalence of oral mucosal lesions.

Materials and methods

Sampling and sample sizes

The Chilean population is 13 425 320, of which 5 257 937 reside in Santiago; this includes the capital city and 22 other districts. The urban population constitutes 96.52% of the metropolitan region population (2). The study sample was calculated according to the method described by Cochrane, at 95% confidence interval with a 0.03% range of error (3), and consisted of 889 individuals. The prevalence of denture stomatitis was described by Vigild (4); 29.6% was used to determine the sample size. This percentage is close to the average of the prevalence of these lesions described in the literature concerning elderly people (4–8).

The participants in the study were selected using a random stratified sample by age, gender, and socioeconomic status and covering the program for those over 65 years existing in the public and private health system in Santiago. The participants were randomly selected from the list of those people over 65 years registered with the public and the private health systems. The study protocol was approved by the local Committee of Ethics of the University of Chile, Santiago.

Examiner

The examination was carried out by only one well-trained and calibrated examiner (EI). On successive days, groups of 20 photographs were examined that exhibited the full range of oral mucosal lesions expected to be assessed during the survey. Examinations of these photographs were repeated until acceptable consistency was achieved. Results were between 0.61 and 0.80, as assessed by Kappa statistic. The examiner reliability was in the range considered to be good-to-excellent as assessed by Kappa statistic (9). Informed consent was obtained and the patients were informed about their status of oral health, and they were sent for dental treatment if necessary. No biopsies, cytology, or other tests were included in these results.

Criteria for oral mucosal lesions

An oral mucosal lesion was defined as any abnormal change on the oral mucosal surface (red, pigmented, or ulcerative) or any swelling. Developmental defects such as sublingual varix, geographic and fissured tongue, and Fordyce granules were not included. The diagnosis of specific oral mucosal lesions was made on the clinical features according to World Health Organization

(WHO; 10–12). We used the Axéll definitions for lesions without published WHO diagnosis criteria (13).

Statistical analysis

Logistic regression models* were used to assess the influence of the variables, age, gender, denture, smoking, medication use, xerostomia, and social or cultural factors. Risk ratios were calculated with 95% confidence intervals. Statistical significance was defined as $P < 0.05$.

Results

By the design, which is proportional for age and gender to the pattern population, the distribution of demographic characteristics was 551 (62%) women, 338 (37%) men, 560 (63%) individuals who were 65–74 years old, and 329 (37%) individuals who were 75 years and older. Table 1 shows the distribution of the characteristics of the sample by gender.

Over half of the cases (471 individuals (53%)) had one or more oral mucosal lesions (95% confidence interval 49.7–56.3). The most frequent lesions were denture stomatitis (22.3%) and irritative hyperplasia (9.4%). In the 574 denture wearers, the true population in risk of denture stomatitis, the prevalence was 34%. In our sample, 65% of the subjects were denture wearers. Women (27.8%) more frequently had these lesions than men (13.3%). The distribution of all mucosal disorders observed in the sample is shown in Table 2.

Logistic regression model was constructed to analyze the variables associated with more probability of having one or more oral mucosal lesions: age, gender, less than 6 years in formal education, medication, smoking, denture use, xerostomia and no dentist visit in the past year. Only denture use significantly increased the probability of having lesions (Odds ratio (OR) = 3.26, confidence interval 2.42–4.38).

We determined variables associated with an estimated increased risk of having leukoplakia, lichen planus, and lesions associated to *Candida* infection. The stepwise logistic regression model for denture stomatitis contained independent variables relating to age, gender, education level, diabetes, smoking, xerostomia, cleanliness, habits of denture use and denture age (old

*Stata Statistical Software Release 6.0. Stata Corporation, College Station, TX.

Table 1. Characteristics of the sample in both genders

Characteristics	Female (N = 551)		Male (N = 338)		Total (N = 889)	
	n	%	n	%	n	%
General factors						
Systemic disease	466	85	288	85	754	85
Medication use	435	79	257	76	692	78
Low education level (<6 years)	299	54	152	45	451	51
Attention in the public health system	689	80	423	80	711	80
Visited the dentist in the past year	156	28	99	29	255	29
Smoking (daily)	54	10	65	19	119	14
Smoked in the past	181	33	196	58	377	42
Oral status						
Edentulous	156	28	69	20	266	25
Denture use	395	72	179	53	574	65
Variables associated with denture use						
Old denture (were those more than 5 years old)	280	72	101	59	381	68
Unclean dentures	295	76	127	75	422	75
Sleeping with dentures	275	71	113	63	388	69

denture were those that were more than 5 years old). The factors that significantly increased risk of denture stomatitis were female gender (OR = 1.74, confidence interval 1.13–2.68), adherent plaque in prosthesis (OR = 2.73, confidence interval 1.66–4.5), and sleeping with denture (OR = 2.25, confidence interval 1.46–3.47). The logistic regression model for angular cheilitis included the same independent variables plus denture stomatitis. These lesions increased the risk of having angular cheilitis (OR = 3.92, confidence interval 1.46–10.12). Median rhomboid glossitis and angular cheilitis were not analyzed because of their low frequency. The model for leukoplakia and lichen planus included the independent variables age, gender, education level, and smoking. The only risk factor for leukoplakia was smoking (OR = 14.4, confidence interval 4.6–45.05) and for lichen planus was female gender (OR = 5.98, 1.36–26.23). The only type of

lichen planus observed in our sample was the reticular type, and any of the patients revealed to have recurrent lesions in the skin.

Discussion

The comparison of the findings obtained in this study with other similar epidemiological surveys in elderly people reveals that the prevalence of one or more oral mucosal lesions (53%) corresponds to the range of expectations (22.8–61.4%; 4–7, 14–18), but close to the highest prevalence observed by Fleishman et al. (61.4%; 19), and recently by Kovac-kavcic & Skaleric in elderly individuals (61.6%; 18). However, the comparison between epidemiological surveys is difficult as methodologies have not been uniform. Some authors have examined institutionalized individuals (4, 16, 17), the sample size has been smaller than our sample (4, 6, 7, 16, 19), except in the Reichart (14) and Mallo survey (17) in Canadian and Spanish populations, respectively, and finally, the diagnosis criteria for describing one or more oral mucosal lesions have not been clearly established.

We found that denture use raised the probability of having one or more oral mucosal lesions in elderly people (OR = 3.26), but not age, gender, education level, smoking, medication use and xerostomia. However, some of these factors increased the probability of having specific oral mucosal lesions in the sample. It is known that denture wearing is associated with a higher prevalence of oral mucosal lesions (6, 7, 17), but this association has not been observed in populations where the use of denture wearing is low (5).

Table 2. Prevalence of oral mucosal lesions in 889 individuals older than 65 years in Santiago city

Oral mucosal lesions	N	%	95% Confidence interval
Denture stomatitis	198	22.3	19.6–25.0
Irritative hyperplasia	84	9.4	7.5–11.3
Oral mucosal varicosities	80	9.0	7.1–10.9
Frictional keratosis	53	6.0	4.4–7.6
Solitary pigmented lesions	36	4.0	2.7–7.3
Traumatic ulcerations	31	3.5	2.3–4.7
Angular cheilitis	26	2.9	1.8–4.0
Multiple-pigmented lesions	25	2.8	1.7–3.9
Hemangioma	20	2.3	1.3–3.3
Lichen planus	19	2.1	1.2–3.0
Leukoplakia	15	1.7	0.8–2.6
Recurrent aphthous stomatitis	12	1.4	1.0–1.8
Nicotine stomatitis	12	1.3	0.6–2.0
Median rhomboid glossitis	8	0.9	0.3–1.5
Actinic cheilitis	8	0.9	0.3–1.5
Pyogenic granuloma	6	0.7	0.1–1.3
Oral squamous papilloma	5	0.6	0.1–1.1
Mucocele	2	0.2	0.17–0.23

Leukoplakia

The prevalence of specific lesions like leukoplakia in the Chilean population was 1.7%, which is in the expected range of 1–5% (20), only slightly lower than the results obtained from older people in Spain 2.8% (17), Denmark 2.5% (4), Finland 3% (16), and China 2.6% (21). This percentage is really different than the results obtained in India 11.7% (22), and recently in Italy 13% (23) and Taiwan 17.6% (24). The lowest prevalence of leukoplakia in our population could be as a result of the lower frequency of tobacco use in our sample (14%), although the percentage of people who smoked in the past was high (42%). The prevalence of this lesion was higher in populations where this habit was more common (23, 24).

Lichen planus

The prevalence of lichen planus in our sample was 2.1%, which is slightly higher than the prevalence described in Germany 1.0% (14), Spain 1.1% (17), or Denmark 0.2% (4), but is lower than those observed in China 4.1% (21) and Slovenia in individuals over 65 years 4.1% (18). Lichen planus was more frequently observed among women than among men (3.1 and 0.6%, respectively). Female gender increased the probability of having lichen planus by five times; similar to the results obtained by Axéll & Rundquist (25).

Lesions associated to *Candida* infection

Denture stomatitis was observed in 198 cases (22.3%). The higher prevalence of denture stomatitis among women was similar to the findings of Axéll et al. (12) and Kovac-kavcic & Skaleric (18). Unclean dentures (visible adherent plaque in dentures) and sleeping with dentures were associated with a major probability of having this lesion. It is important to remember that the swallowing or aspiration of denture plaque could expose patients, particularly the immunocompromized host and those medicated elderly, to the risk of unexpected infections (26, 27). In our sample patients with denture stomatitis, there was a greater probability of having angular cheilitis, an association described in the past by Mäkilä (28).

We can conclude that the population older than 65 years with one or more oral mucosal lesions is high (53%) in Santiago. The studies about prevalence of these lesions in Latin-American countries are limited (29). This study has provided information on epidemiological aspects of oral mucosal lesions, which might prove valuable in planning future oral health studies and imple-

menting preventive programs in Santiago. In our sample, the principal factor that increased the probability of having lesions is denture use. For specific lesions, the factors associated were gender, smoking, and habits and hygiene in denture wearers.

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