

Prevalence of Oral Anomalies and Pathologies in the Pakistani Population - A Cross Sectional Study



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INTRODUCTION: Comprehensive head and neck examinations require sound knowledge of the population's oral anatomy, its variation, and common pathologies to distinguish between anomalous and pathological processes. Since limited data on this subject is available from Pakistan, the aim of this investigation is to determine the prevalence of oral anomalies and pathologies in healthy, Pakistani, dental patients. This will establish baseline statistics for the Pakistani population, and contribute to the international epidemiological data.

METHODOLOGY: A total of 1293 consenting, dental patients between the ages of 5-90 years underwent comprehensive head and neck examinations. Any mucosal anomaly or abnormality identified during the exam was recorded. **RESULT:** At least one anomaly, or abnormality was noted in 61% of the population. The most commonly documented entity was linea alba (29.8%, n=324), followed by benign oral pigmentation (11.3%, n=146), coated tongue (5.7%, n=74), prominent papillae in (5.1%, n=71), fissured tongue (5%, n=65), varicosities (4.8%, n=62), ulcers in (4%, n=52), Fordyce's granules (2.5%, n=32) and white patches (1.8%, n=23).

CONCLUSION: It is essential for dental professionals to be familiarized with the anatomical variations of the oral cavity, oral anomalies and common pathological processes to avoid misdiagnosis and prevent undue distress to the patient.

KEY WORDS: Oral anomalies, oral pathologies, oral abnormalities.

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INTRODUCTION

A comprehensive oral examination is an essential aspect of a dentist's exam. It allows dentists to identify, diagnose and manage pathological conditions affecting the oral region. Conduction of thorough head and neck examination needs a sound foundation of normal anatomical structures in the region and competence to identify unusual presentations. Since anomalous presentations may appear pathological to an untrained eye, one of the key role of the dentist is distinguish between the two and prevent misdiagnosis.^{1,2}

The prevalence of oral anomalies and pathologies has shown significant geographic variation, from reports ranging between 9.7% in Malaysian studies to as high as 81.3% in Italian investigations.^{3,4} Epidemiological data on prevalence of oral anomalies and pathologies from Pakistan is extremely limited. Only two studies have attempted to determine the prevalence of oral lesions in the Pakistani population. However, these studies are restricted by the type of lesion

being investigated, or the medical status of the patient.^{5,6}

The aim of this investigation was to determine the prevalence of oral anomalies and pathologies in healthy Pakistani patients that are seen in the university clinics for routine dental work. Details from the extra oral examination were also included for completeness. We believe that these results will help in establishing baseline statistics for the Pakistani population, highlight the geographical variation of this region, and contribute to the international epidemiological data in this avenue. We also want to enforce the need to clinically train dental professionals to identify these common entities accurately, so appropriate management can be provided.

METHODOLOGY

This study was approved by the institution review board at Riphah International University (IIDC/IRC/2015/04/001). A cross-sectional study design was used to determine the prevalence of oral anomalies and pathologies in asymptomatic dental patients in Islamabad, Pakistan. Data was collected by consenting patients seen at the dental screening clinics at a tertiary dental care hospital from May to August 2015.

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World Health Organization sample size calculator was used to calculate the sample size:

$$n = \frac{Z^2 * P * (1-P)}{d^2}$$

Where; n= sample size

Z= Z statistics for confidence level (99% or 2.85)

P= Expected prevalence or proportion (61.8%)

d= Precision (5% or 0.05)

The expected prevalence (61.8%) was taken from a study conducted in North India.⁷ The sample size was calculated to be 629. A total of 1293 randomly selected individuals between the ages of 5-90 years were enrolled in the study. It was ensured that the patient's chief complaint was a dental problem. Any patient coming in with a complaint of oral mucosal problem was excluded from this investigation.

Two general dentists were trained by an oral medicine expert to perform comprehensive head and neck examinations on each participant using a light source, dental mirror, and a piece of gauze for the tongue. Their competence at identifying anomalous and pathological processes in the oral cavity was assessed by the clinical oral pathologist and the oral medicine expert before the initiation of the study.

The dentists performed comprehensive oral exams on consenting patients on the dental units in the out-patient clinics. Records were made of any anomaly or pathology noted on the buccal, labial, palatal, lingual, sublingual and gingival mucosae. Anomalies of teeth, if any, were also recorded. Details of caries, filled and missing teeth were not noted. Positive findings along with the patient's demographic details were transferred on to a data sheet; all identifiable information was discarded after this step.

The data was analysed using SPSS version 20. Descriptive statistics were used to calculate the prevalence of individual anomalies and pathologies. Cross-tabs were used to compare the prevalence of common anomalies between males and females and among different age groups.

RESULTS

Out of the 1293 patients examined, 52.7% (n=681) were male and 47.3% (n=612) were female. The mean age range of patients seen in the screening clinics was 21-30 years; 25.1% (n=324) with a standard deviation of +1.65. About 61% (n=786) of patients had at least one anomaly.

Linea alba was noted in 29.8% (n=324) (figure 1), ethnic or physiological pigmentation in 11.3% (n=146) (figure 2), coated tongue in 5.7% (n=74) (figure 3), prominent papillae in 5.1% (n=71), fissured tongue in 5% (n=65) (figure 4), varicosities in 4.8% (n=62), ulcers in 4% (n=52), attrition 2.9% (n=37), Fordyce's granules in 2.5% (n=32), dental abscess in 2.5% (n=32), white patch in 1.8% (n=23),



Fig:1



Fig:2



Fig:3

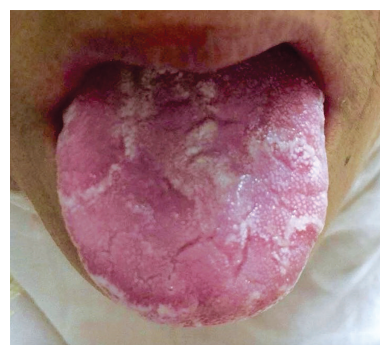


Fig:4

xerostomia in 1.4% (n=18), and "others" in less than 1%.

The "others" category lumped up entities like abrasion (0.8%, n=10), tori and fungal infection (0.6%, n=7), abfraction (0.5%, n=6), fluorosis (0.4%, n=5), and amalgam tattoo (0.3%, n=4). It also included haemangioma, median rhomboid glossitis, inflammatory fibrous hyperplasia, tooth anomalies, mucocele and geographic tongue (figure 4), each of which

were identified in 0.2% (n=3) of the sample. Oral submucous fibrosis, lichen planus, pyogenic granuloma and chemical burns were noted in 0.2% (n=2) of the population while scarred tongue and sebaceous cyst were seen in 0.1% (n=1).

Linea alba was more frequently noted in females, 30.4% (n=186) vs 29.2% (n=199) in males. Fissured tongue also showed a female predilection, 5.2% (n=32) vs 4.85% (n=33) in males. Benign oral pigmentation, arcus senilis, varicosities and nevi were more common in males (12.04%, n=82: 11.4%, n=78: 5.1%, n=35 and 10.4%, n=71 respectively) as compared to females (10.5%, n=64: 7.35%, n=45: 4.6%, n=28 and 9.6%, n=55 respectively). (Table 1)

LESIONS		Males (%)	Males (n)	Females (%)	Females (n)	Total (%)	Total (N)
INTRA ORAL							
Linea Alba		29.2	199	30.4	186	29.8	385
Benign Oral Pigmentation		12	82	10.5	64	11.3	146
Coated Tongue		6.3	43	5	31	5.7	74
Prominent Papilla		5.4	37	5.6	34	5.1	71
Fissured Tongue		4.9	33	5.2	32	5	65
Varicosities		5.1	35	4.6	28	4.8	62
Ulcers		3.8	26	4.2	26	4	52
Attrition		2.8	19	2.9	18	2.9	37
Fordyce's Granules		3.8	26	0.98	6	2.5	32
Dental Abscess		2.6	18	2.3	14	2.5	32
White Patch		2.3	16	1.1	7	1.8	23
Dry Mouth		0.4	3	2.5	15	1.4	18
EXTRA ORAL							
Nevi		10.4	71	9.6	55	9.7	126
Arcus Senilis		11.4	78	9.4	45	9.4	122
Pinguecula		1.6	11	0.3	2	1	13

Table: 1 Showing the frequency and percentages of some oral anomalies and abnormalities, and their distribution among male and female patients, where "n" in the frequency of the lesion in either male or female, "N" is the total number of a particular anomaly, "%" is the percentage of an anomaly in either males or females and "%*" is the total percentage of lesions.

Linea alba was most commonly observed in the age group 31-40 years (35%) followed by 41-50 years (33.7%) and 21-30 years (33.02%). Fissured tongue was seen in the age groups 61-70 years (12.5%), 51-60 years (12%) and 71-

80 years (11.76%). Varicosities were also seen in the elderly population, 71-80 years (17.6%), followed by 61-70 years (14%) and 51-60 years (7.8%).

DISCUSSION

According to our investigation, 60.8% of the population presented with at least one oral anomaly. This is in close proximity with the investigations performed in Italy 81.3%, Yemen 77.1%, Brazil 73.4%, North India 61.8%, Slovenia 61.6%, Kuwait 58.1% and South India 41.2%.^{3,7-13} It is significantly higher than reports from Iran 19.4%, Turkey 15.5%, Saudi Arabia 15%, China 10.8%, USA 10%, and Malaysia 9.7%.^{4,14-18}

While linea alba was the most prevalent anomaly identified in our population and in Turkish studies, the results from other countries are quite variable.¹⁵ Coated tongue was the most common oral anomaly identified in Italian men (51%), Fordyce granules in the Slovenian population 49.7%, fissured tongue in the Brazilian-Indian population and lingual varicosities in the older individuals of Thailand.^{3,9,10,13}

The more frequently encountered oral, and extra oral anomalies and pathologies are described under individual headings below.

Linea Alba:

Linea Alba was observed in 29.8% (n=324) of the population. We believe that this can be attributed to the diet and habits of the Pakistani population. Our results are comparable to the North Indian population (22.2%) that consumes a similar diet and exhibits similar habits. Similar to our results, the North Indian study also reported a higher prevalence in females.⁷ Our results are significantly higher than other populations that consume much softer diets; Kuwait 11.4%, Turkey 4.2%, and Slovenia.^{10,11,15}

Fissured tongue:

Fissured tongue was seen in 5% of the population, and it was more common in females (5.2%, n=32) in comparison to males (4.85%, n=33). The prevalence from Thailand (28%), and Slovenia (21%) is much higher than what was noted in our population.^{10,13} It was more comparable to the results yielding from South India (5.7%), Iran (4%), and China (3.2%).^{12,17,19} The percentage was however significantly higher than the Saudi population.¹⁶ The reasons for discrepancy in results is not known.

Ethnic or Physiological Pigmentation:

Physiological or racial oral pigmentation was noted in 11.3 % of the Pakistani population. This can be attributed

to the higher amount of melanin expression in the skin and mucus membranes.¹ The results from the slightly darker population of North India were 29.9%, while those from fairer populations were significantly lower than our results; Iran 2.5%, Saudi Arabia 0.6% and Turkey 0.5%.^{7,14-16}

Coated tongue:

About 12% of the patients in our study had coated tongues. This frequency is lower than the reports from Italy 51.4% and India 28%^{3,20} but much higher than Turkish population 2.1%.¹⁵ This variation may have resulted from the diets consumed by respective populations.

Fordyce's Granules:

We recorded Fordyce's granules in 2.5% (n=32) of the population. Our results were significantly lower than those noted in the Slovenian 49.7% and Kuwaiti 20% population; however they were similar to the results from South India 6.55%, Saudi Arabia 3.8%, Turkey 2.8 %, Iran 2.8%.^{10-12,14-16}

Lingual Varices:

We found lingual varices in 4.8% (n=62) of the population. Most of the individuals with varices were in the elderly category; 17.6% in 71-80 years, 14% in 61-70 years, 7.8% in 51-60 years and 5.7% in 41-50 years. The reported incidence of 60% in the Thai population is very high in comparison to our results, possibly because their patient pool consisted of the elderly.¹³ Our results however are notably higher in comparison to the results yielding from Slovenia 1.6%, and Iran 1.5%.^{10,14}

Traumatic Ulceration:

Traumatic ulceration was noted in 4% (n=52) of our sample population. This is much lower than the reports from the elderly population of Thailand 15.6%, who may exhibit a higher incidence due to denture use. Our results are somewhat comparable to the results from North India 6.1%, Saudi Arabia 1.9%, China 1.1% and 0.9% in Turkey.^{7,13,15-17}

White Lesions:

About 3% (n=34) of the patients presented with white lesions. While the majority of these were frictional keratosis, we had one patient with leukoplakia, 0.08% of the sample population. This is significantly lower than the 13.8% reported in Italian men, 3.1% in Slovenians, and 1% in South Indians.^{3,10,12} However, these results are consistent with the findings from China 0.2%, and Iran 0.1%.^{14,17}

One of the limitations of this study was sampling patients from a single institution in Pakistan. This institute may

provide a good estimate for Northern Pakistan but failed to provide a proportionate representation of the rest of the country. Future studies can aim at including appropriate representation from each part of Pakistan to provide a better estimate.

CONCLUSION

Familiarity of dental professionals with anatomical variations of the oral cavity and common pathological processes is essential because the majority of the population will present with at least anomaly or pathology. This knowledge will prevent misdiagnosis and undue stress to the patient.

CONTINUING EDUCATION

Which of the following is an oral anomaly?

- a) Leukoplakia
- b) Aphthous ulcer
- c) Fordyces granules
- d) Traumatic ulcer

Correct answer (d) Fordyces granules

Which of the following is the most common oral anomaly observed in Pakistani patients?

- a) Linea alba
- b) Fordyces granules
- c) Physiological pigmentation
- d) Prominent papilla

Correct answer (a) linea alba

Lingual varices are more frequently observed in?

- a) 2nd decade of life
- b) 3rd decade of life
- c) 4th decade of life
- d) 7th decade of life

Correct answer (d) 7th decade of life

A biopsy may be indicted to diagnose?

- a) Geographic tongue
- b) White patch
- c) Linea alba
- d) Traumatic ulcer

Correct answer (b) White path

CONFLICT OF INTEREST

There is no conflict of interest.

No sources of funding were used for the study.

We certify that the presented data is accurate and can be

made available on request.

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