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Asymptomatic and Previously Undetected Oral Lesions as Incidental Findings and Association with Medical Comorbidities

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ABSTRACT

Background: The diagnosis of life-threatening maxillofacial pathologies at a very late stage in developing countries made us ponder over the prevalence of unnoticed pathologies that are in early stages, to create awareness among patients and identify the systemic health risk factors associated with these pathologies. **Objective:** This study aimed to determine the frequency of unnoticed or ignored oral & maxillofacial pathologies, furthermore, to observe the association of systemic diseases with these pathologies, and most importantly, to inculcate the significance of routine oral screenings among patients to reduce the morbidity and mortality rate. **Study Design:** Cross-sectional study. **Settings:** Tertiary Care Teaching Hospital, Lahore, Pakistan. **Duration:** 16 January 2023 to 30 June 2023. **Methods:** 10800 participants recruited in the study. After obtaining informed consent, history and clinical examination were performed according to WHO guidelines. A record of all the oral and maxillofacial pathologies was made, which were recognized solely in clinical or radiographic examination as incidental findings. Data analysis was performed using Microsoft Excel for Mac version 16.56 (2021 Microsoft). **Results:** This study comprised of 54.7% female and 45.3% male with a mean age of 37.38 ± 15.26. The highest frequency of unnoticed pathologies was inflammatory and tongue lesions. **Conclusion:** The detection of a high percentage of oblivious oral & maxillofacial pathologies on clinical and radiographic examination exalts the significance of seeking regular oral care and screening by the patients. This will ensure the early detection of consequential pathologies.

Keywords: *Oral & maxillofacial pathologies, Unnoticed, Incidental findings, Undetected, Oral screening.*

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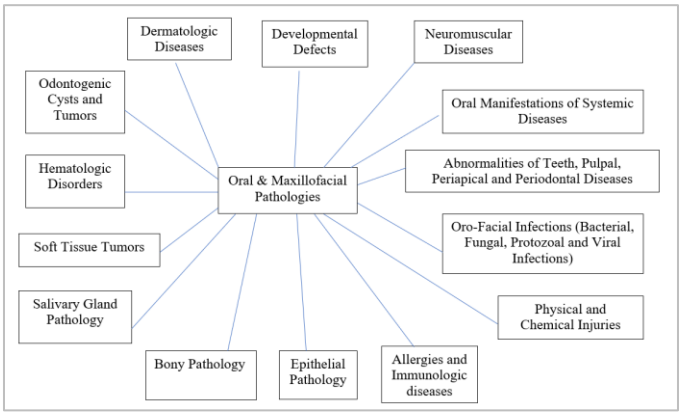
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INTRODUCTION

Oral health has a synergistic impact on overall physical health; to maintain the health of this dynamic relation, regular oral screening is required. Most of the oral diseases are progressive and culminate in nature, and their diagnosis is based on thorough history, clinical and radiographic assessment, therefore, early detection and diagnosis through regular dental checkups saves the patients from morbidity.

Oral & maxillofacial pathologies include diseases of oral soft tissues, teeth and jaws which are shown in figure 1.[1]

Figure 1: The classification of oral & maxillofacial pathologies[1]



Among these some of these pathologies are initially innocuous and reversible in nature, if identified and treated at early stages, prevents loss of tooth and periodontal support as in cases of gingival diseases, periodontal diseases and perio-endo lesions.[2,3] The pathological transformation in its initial stages, appears as change in surface texture, loss of integrity, change in color and size, mark the beginning of dysplasia.[4] Moreover, oral lesions are not clearly distinguishable and can mimic one another, their diagnosis require ruling out all reactive, inflammatory or developmental lesions with indistinguishable clinical appearances. The most common oral potentially malignant disorders (OPMDs) are white, red or mixed mucosal patches (leukoplakia and erythroplakia),[5] where, timely management may result in prevention of development of oral squamous cell carcinoma (OSCC).[6] Correspondingly, the pigmented oral lesions are mostly physiological and asymptomatic, however few pigmented lesions are thought to be precursors to malignant melanoma. Likewise, some of the odontogenic and non-odontogenic cysts and tumors have indolent pathway resorption and mobility of teeth, pathological fractures and/or malignant transformation in epithelial lining.[7]

The factors which delay this diagnostic trail are lack of public awareness about self-examination and regular dental check-ups causing delays in diagnosis, hence, in turn affecting the morbidity and mortality.[8] This study was conducted with the aim to determine the frequency of oral & maxillofacial anomalies and pathologies overlooked by patients, which were diagnosed incidentally by methodical clinical examination so that timely treatment can be made for better outcomes. Secondly, co-relate the oral pathologies with systemic medical conditions. Most importantly, to create awareness of significance of routine oral screenings among patients to reduce the morbidity and mortality rate.

METHODS

This cross-sectional study was conducted on 10800 patients at a tertiary care hospital setting, Lahore, Pakistan, from 16 January 2023 to 30 June 2023. Ethical permission was obtained from the institution's review board and ethical committee (IRB: 17th December/ 2589/22). The patients of all ages and genders, with or without any co-morbid medical condition, who gave consent to participate, were included in the study. After obtaining consent, a detailed history was taken, and clinical extraoral and intraoral examination was performed under dental unit light with diagnostic instruments by the faculty of oral diagnosis, oral pathology, and oral surgery department. Record of only one most clinically significant oral and maxillofacial pathology was made per patient, based on severity and prognostic factors, which were neither part of the patient's chief complaint being overlooked by them nor had the patients any perception or realization of those pathologies. Minor concurrent lesions were not included in the study. Diagnosis was based only on clinical examination, radiographic findings with specialist confirmation. All collected data was entered into statistical software package collected was entered into statistical software package STATA-14 (STATA Corp, College Station, Texas, USA) for further analysis. To determine factors associated with the presence of oral lesions, binary logistic regression analysis was performed. The dependent variable was the presence or absence of oral lesions (binary outcome). independent variables included age, gender, medical history (combined variable covering diabetes, hypertension, and other systemic conditions), and social history (combined variable covering smoking and betel quid use). Due to limitations of sample size, oral lesions were investigated as a single pooled group rather than by individual oral lesions subcategories. The strength of associations was expressed as odds ratios (ORs) with 95% confidence intervals (95% CIs). A p-value < 0.05 was considered statistically significant. Frequency and percentage were calculated for gender, presenting complaint, medical history, social habits, current medications and oblivious oral pathologies to patient. Mean and standard deviation were calculated for age.

RESULTS

Total number of participants included in this study were 10800, out of which 54.7% were female and 45.3% were male with mean age 37.38 ± 15.26. The presenting complaint of 75.2% participants was pain in tooth, whereas 33.3% reported with bleeding gums, 11.4% for rehabilitation of missing teeth and 8.5% with ulcer. Medical history with current medications are enlisted in table 1.

Table 1: Frequency and percentage of medical history and medications currently used by study participants

Medical Conditions	n	%	Medical Conditions	n	%
Allergy	594	5.5	Insignificant	7461	69
Asthma	134	1.24	Liver Disease/Hepatitis A/B/C	112	1.03
Cardiac Disease	287	2.65	Kidney Disease	23	0.21
Diabetes	1890	17.5	Pregnancy	18	0.16
Hypertension	2353	21.79	Previous Cancer	18	0.16
Medications	**n**	**%**	**Medications**	**n**	**%**
Analgesics	2862	26.5	Anxiolytics	130	1.2
Anti-asthmatics	134	1.24	Bisphosphonates	7	0.06
Antidepressants	129	1.19	Corticosteroids	24	0.22
Antihypertensives	1728	16	Diuretics	33	0.3
Anti-hypercholesterolemic	226	2.09	Insulin	378	3.5
Antacids	127	1.17	None	5022	46.5

As far as social habits are concerned, 66.3% patients did not report any habits, whereas 27.8% reported cigarette smoking, 5.9% and 5.6% reported use of betel quid (pan) and areca nut (chalia) respectively, and 1.5% reported sheesha smoking. The frequency of undetected oral lesions that were noticed on clinical examination is depicted in Table 2.

Table 2: Frequency and percentage of oral & maxillofacial pathologies detected on clinical examination

Oral & Maxillofacial Pathologies								
Reactive /Adaptive	**n**	**%**	**Developmental**	**n**	**%**	**Cystic**	**n**	**%**
Fibroepithelial polyp	150	1.39	Linea alba	87	0.80	Dentigerous cyst	7	0.06
Pyogenic granuloma	33	0.30	Fordyce's Granules	69	0.63	Odontogenic Keratocyst	5	0.046
Traumatic Fibrosis	21	0.19	Tori/exostosis	28	0.26	Periapical Cyst	75	0.69
Submucous fibrosis	12	0.11	Leukoedema	17	0.15	**Immune Mediated**		
Inflammatory			**Epithelial**			Lichen planus	18	0.16
Mucositis	318	2.94	Frictional keratosis	57	0.16	Systemic lupus erythematosus	1	0.009
Gingivitis	2590	23.98	Leukoplakia	157	1.45	**Malignancies**		
Periodontitis	1256	11.63	Erythroplakia	25	0.23	Squamous cell carcinoma	9	0.08
Osteomyelitis	15	0.14	**Bone Pathologies**			**Tongue Lesions**		
Odontogenic Sinusitis	12	0.11	Benign fibro-osseous lesions	12	0.11	Thick yellow Coated Tongue	1867	17.3
Periapical Granuloma	1367	12.65	Osteonecrosis	1	0.009	Fissure Tongue	165	1.52
Salivary gland disorders			**Pigmented**			Geographic tongue	23	0.21
Sialolithiasis	9	0.08	Physiological pigmentation	2891	26.82	Tongue depapillation	19	0.17
Sjogren Syndrome	1	0.009	**Odontogenic tumors**			**Teeth Abnormalities**		
Mucocele	4	0.037	Lateral periodontal cyst	2	0.018	Dens invaginatus	27	0.25
Sialadenitis	9	0.083	Odontoma	2	0.018	Peg laterals	13	0.12
Pleomorphic adenoma	1	0.009	Adenomatoid Odontogenic Tumor	2	0.018	Supernumerary teeth	18	0.16
			Myxoma	1	0.009	Fluorosis	257	2.38

Logistic regression analysis depicted that a positive medical history was significantly associated with the presence of oral lesions. (Table 3)

Table 3: Logistic regression analysis of oral lesions with other variables

Variable	Odds ratio	Confident interval		P-Value
Medical	7.06	1.61	35.71	0.01
Social	1.01	0.23	4.33	0.99
Gender	2.76	0.72	10.45	0.13
Age	1.10	0.58	2.05	0.76

DISCUSSION

Early detection of oral diseases depends primarily on regular dental visits, many individuals do not comprehend the importance of regular dental checkups and visit the dental health centers with aggravated dental problems at late stages.[9] Almohammed Saleh *et al*., reported 44.7% of participants believed about six monthly dental screening, while 24.8% reported to visit dentist only when necessary.[10] Alhareky *et al*., also reported low prevalence of routine dental checkups.[11] Similar trend was also observed in current study that only 2.8% of patients presented for routine dental screening, whereas, the main compelling reason in 75.2% of participants to seek dental consultation was pain, followed by bleeding gums (33.3%). Analogously a systematic literature review also suggests a general trend of patients to seek treatment mostly in case of second or third episodes of dental pain due to self-medication practices.[12]

Our study recorded, that some patients diagnosed with periapical cysts presented with chief complaint of either pain or carious tooth while 45% of odontogenic cysts and tumors were as detected as incidental findings, which coincides with the systematic review suggesting 48% of odontogenic cysts and tumors as incidental findings, by Macdonald-Jankowski DS.[13]

The percentage of unnoticed and neglected OPMDs by the patients in this study were 3.19%, which is very high, keeping in mind the meta-analysis reported by Mello *et al* in which the general overall prevalence rate of OMPDs was 4.47% (95% CI = 2.43-7.08).[14] It is challenging to anticipate rate, pattern and manner of malignant transformation of each OPMDs. Hence, each OPMD warrants consideration as a potential risk, to undertake immediate treatment or adhere to regular follow-up examinations.[15]

Dentists should also have sound knowledge about oral manifestations of systemic diseases, as even small changes in oral mucosa may be related to systemic disorder.[16] As data of our study shows signification association of oral lesions with systemic medical conditions, those with oral lesions were 7.06 times more likely to be medically compromised. In our study the oral manifestations observed with high frequency were related to changes in the tongue like coated tongue and fissure tongue in 17.28% and 1.52% of participants respectively. Inspection of tongue is an important constituent of clinical diagnostic protocol, according to literature, the thin, white or reddish tongue coating indicates good general health while white or yellow thick tongue coating may be sign of inflammation, infection, stress as well as immune and endocrine disorders.[17] In our study, among 1890 diabetic patients, 92% had fissure tongue followed by 56% with yellow thick coated tongue. These findings are in line with Shahbaz *et al* and Hsu *et al*, in which thick coated tongue was found in 57.6% and 50.8% patients of type 2 diabetes myelitis respectively,[18,19] whereas, fissure tongue was reported in 91.8% of diabetic patients by Shahbaz *et al*.[18] Other systemic conditions associated with fissure tongue include psoriasis, Down's syndrome, Melkersson- Rosethenal, pernicious anemia, macroglossia.[20]

From the data of current study, we noticed geographic tongue (GT) and tongue depapillation in 0.27% or 2.76% patients. It was observed that all patients of GT had history of hypertension, this could be possibly due to association of GT with antihypertensive medication as reported by Dafar *et al*,[21]

while others suggest GT to be oral manifestation of psoriasis.[20] Tongue depapillation, i.e. atrophy of filiform and fungiform papillae are common in red blood cell disorders as iron deficiency anemia and B complex deficiency.[20]

This study detected physiological pigmentation in 26.82% of patients. Oral pigmentations may be associated with systemic disease like Peutz -Jeghers syndrome, Addison's disease, and Laugier - Hunziker syndrome.[22] Moreover, it is important to discriminate oral pigmentations from oral mucosal melanoma, the frequency of which accounts less than 1 % of all oral malignancies.[23]

CONCLUSION

This study revealed high incidence of maxillofacial pathologies overlooked by patients discovered incidentally on clinical examination, with some of them at advanced stage. A significant number of these patients lacked awareness or understanding of their oral health conditions as well as strong connection of oral and systemic health. Thus, it should be one of the vital tasks for health authorities and dentists to formulate education programs regarding the importance of regular dental screening and self-examination practices. Additionally, identify barriers of dental care and promote positive oral health seeking behavior. It is also imperative for dentists to strengthen their concepts of oral & maxillofacial pathologies for skillful differential and definitive diagnosis and comprehensive management, with enactment of specialist referrals, whenever necessary.

LIMITATIONS

The study was formulated to document a single oral lesion per patient to simplify data collection. When multiple lesions were present, only principal lesion based on severity and prognostic factors was identified and recorded. Also, this study suggests an overall associative analysis between medical comorbidity and presence of oral lesion, outlined as an incidental finding. It was not designed as a stratified, lesion-specific comorbidity analysis. Moreover, this study did not record the reasons for ignorance or delays to seek dental treatment and similar local factors.

SUGGESTIONS / RECOMMENDATIONS

The high prevalence of incidental oral and maxillofacial lesions highlights the need for proactive screening and increased public awareness. Community-based educational programs in local languages, routine oral examinations during general health check-ups, and social media or smartphone-based campaigns can improve early detection, particularly among younger populations.

CONFLICT OF INTEREST / DISCLOSURE

All authors declare no conflict of interest.

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Not applicable.

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