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FREQUENCY OF AMELOBLASTOMA AMONG PATIENTS PRESENTING TO ORAL AND MAXILLOFACIAL SURGERY DEPARTMENT, AYUB TEACHING HOSPITAL ABBOTTABAD.

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Abstract

Background: *Ameloblastoma is a benign locally aggressive odontogenic tumor with recurrence potential. Its frequency varies geographically, and limited regional data are available from northern Pakistan. This study aimed to determine the frequency of ameloblastoma among patients presenting with odontogenic tumors at Ayub Teaching Hospital, Abbottabad, and the associated demographic and behavioral factors.*

Methods: *A cross-sectional study was conducted in the Oral and Maxillofacial Surgery Department over six months. A total of 100 histologically confirmed odontogenic tumor cases were included using non-probability consecutive sampling. Demographic variables, smoking status, and chewable tobacco use were recorded. Histopathology confirmed the diagnosis of ameloblastoma. Data analyzed using SPSS version 20. Frequencies, percentages, and correlation analysis were performed, with a p-value ≤0.05 considered statistically significant.*

Results: *Among the study participants, 79% were male and 21% were female, with the majority (70%) aged between 40 and 60 years. Ameloblastoma was diagnosed in 20% of patients. Although males accounted for most cases (18 out of 20), gender did not show a statistically significant association with ameloblastoma ($p>0.05$). A significant positive correlation was observed between ameloblastoma and smoking ($r=0.565$, $p<0.01$) as well as chewable tobacco use ($r=0.212$, $p<0.05$). Age demonstrated a weak but significant negative correlation with ameloblastoma ($r=-0.199$, $p<0.05$). No significant association was found with occupation.*

Conclusion: *A substantial proportion of odontogenic tumors in this population was ameloblastoma, with predominantly middle-aged males. Tobacco use showed significant associations with ameloblastoma. These findings highlight the importance of early screening, public awareness, and targeted tobacco cessation strategies to reduce disease burden.*

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INTRODUCTION:

Ameloblastoma is a type of odontogenic tumor that can affect either maxilla or mandible but most commonly mandible.[1] It is a benign tumor consisting of proliferating odontogenic epithelium consisting of proliferating odontogenic epithelium forming a follicular or plexiform network in a fibrous stroma. Ameloblastoma is a common tumor affecting the jaws being second only to odontomas.[2] Mostly ameloblastoma affects males and in third decade of life.[3] Posterior region of the jaws is a common site for its occurrence. Ameloblastoma is an epithelial tumor that originates from rest cells of Malassez.[4]

Clinically, ameloblastoma usually presents as asymptomatic and slowly growing expansile tumor.[5] However, it can be locally invasive in nature with a high tendency to recur.[6] Radiographic appearance of the ameloblastoma is characterized by a uni-locular or multi-locular radiolucency with well-defined sclerotic borders.[7] Histologically, ameloblastoma can be of different types like follicular, plexiform, acanthomatous, desmoplastic etc.[4] Ameloblastoma is diagnosed with the help of clinical, radiographic and histologic examination.

Ahire et al[8] conducted a retrospective study on the distribution of odontogenic tumors. A total of 250 lesions out of 6797 registered biopsies were reported from a period of 35 years. The frequency of odontogenic tumors was 7.14 %. The most common lesion was ameloblastoma with an annual frequency of 30.8 %. In another study, Kokobun et al[9] analysed 1089 cases of odontogenic tumors between 1975 and 2020. They reported the frequency of amelobastoma to be 41.9 %. Similarly, Naz et al[10] conducted a retrospective study on seven years archived records to evaluate the odontogenic tumors. A total of 179 cases were reported out of which ameloblastoma was most frequent (n=113, 61.3 %).

Studies have reported different frequency of ameloblastoma based on the geographic pattern. Also, there is scarcity of literature regarding the frequency of ameloblastoma in our region.[1,8,9] Therefore, the present study aims to determine the frequency of ameloblastoma among patients presenting to the oral and maxillo-facial surgery department of the Ayub Teaching Hospital Abbottabad. This will help both the clinician and pathologist in establishing the diagnosis of the tumor and also help the clinician to understand and manage ameloblastoma in a much better way. Therefore, the aim of the present study is to determine the frequency of ameloblastoma among patients presenting with odontogenic tumors to Oral and Maxillo-Facial Surgery department of Ayub Teaching Hospital Abbottabad.

MATERIALS AND METHODS

In this cross-sectional descriptive study non probability consecutive sampling was used. Sample size of 100 patients was selected for the present study (CI 95%, Margin of error 10 %, estimated frequency 41.9 %)[9]. Ethical approval was obtained from ethical committee Medical Teaching Institute Abbottabad. Patients of both genders aged 17 to 60 years presenting to the oral and maxillofacial surgery department of Ayub Teaching Hospital who were diagnosed histologically with odontogenic tumors were included in the study. The purpose of the study and the associated risks and benefits were explained to the patients and written consent was taken. Those patients who refused for consent, those with history of recurrent tumors and of repeated biopsies of same lesion were excluded from the study, The confidentiality of the data was ensured. All the suspected lesions presenting clinically as odontogenic tumors were sent to the hospital laboratory for histological analysis to confirm the diagnosis. The number of ameloblastoma cases and other details like age, gender, address, occupation, history of smoking, history of betel nut and tobacco chewing and family history of tumors were noted in the data collection proforma.

DATA ANALYSIS:

SPSS version 20 was used for data analysis. To check the normality of data in case of quantitative variables like age, duration of cigarette smoking, duration of chewing tobacco and betel nut use, Shapiro Wilk test was applied. Frequencies and percentages were calculated and correlation

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analysis was performed. P value of 0.05 or less were considered significant.

RESULTS:

The analysis includes 100 study participants in total. Out of 100, 79 % were males and 21 % females. Age varied between 40 and 60 years. Employment rate was 72 %. A statistically significant association was found between gender and employment ($p < 0.01$).

Table 1: Demographic details

Demographic characteristics		Gender		Total
		Female	Male	
Age[ns]	20-39 yrs	9	21	30
	40-60 yrs	12	58	70
Occupation[**]	Employed	2	70	72
	Unemployed	19	9	28
Total		21	79	100

([**]=p<0.01, [ns]=p>0.05)

Table 2 displays the individuals' smoking status. 78% of the population were of non smokers and the rest use to smoke variably. There was no statistically significant relationship between gender, smoking status, or smoking intensity ($p > 0.05$).

Table 2: Smoking status of study participants

Smoking status		Gender		Total
		Female	Male	
Smoking[ns]	No	20	58	78
	Yes	1	21	22
Smoking intensity[ns]	< than 1 pack per day	0	6	6
	> than 1 pack per day	0	5	5
	Casual (<5 cigrettes per day)	1	10	11

([ns]=p>0.05)

Table 3 provides specific usage trends for chewable tobacco. Males consumed chewable tobacco at a much higher rate ($p < 0.01$). In terms of frequency, 37% said they used chewable tobacco less than five times a day, 18% said they used it six to nineteen times a day, and 22% said they used it more than twenty times a day. There were statistically significant correlations between the usage of chewable tobacco and its intensity ($p < 0.01$).

Table 3: Chewabale tobacco (Gutka, Naswar, Chalia) status of study participants

Chewable tobacco status		Gender		
		Female	Male	Total
Chewable tobacco[**]	No	20	4	24
	Yes	1	75	76
Intensity[**]	6 to 19 times a day	1	17	18
	Above 20 times a day		22	22
	Less than 5 times a day	0	36	37

([**]=p<0.01)

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Table 4 displays the prevalence of ameloblastoma among research participants. In total, 80% of subjects showed no signs of ameloblastoma, whereas 20% received a diagnosis. Despite the fact that ameloblastoma was more common in men (18 instances) than in women (2 occurrences), the difference was not statistically significant ($p > 0.05$).

Table 4: Prevalence of Ameloblastoma in study participants

Ameloblastoma[ns]	Gender		
	Female	Male	Total
No	19	61	80
Yes	2	18	20

([ns]=p>0.05)

Table 5 summarizes the correlation analysis between research factors and ameloblastoma. Ameloblastoma and age showed a strong negative connection ($r = -0.199$, $p < 0.05$). Ameloblastoma was strongly positively connected with smoking ($r = 0.565$, $p < 0.01$), and chewable tobacco use was also highly correlated ($r = 0.212$, $p < 0.05$). There were no statistically significant associations between ameloblastoma and gender or occupation ($p > 0.05$).

Table 5: Correlation between study variables and Amelobastma

Variables	Amelobastma
Gender	-0.125[ns]
Age	-0.199*
Occupation	0.018[ns]
Smoking	0.565**
Chewing tobacco	0.212*

([*]=p<0.05, [**]=p<0.01, [ns]=p>0.05)

DISCUSSION:

This study compared the relationship between tobacco-related behaviors, and the occurrence of ameloblastoma among patients presenting to the hospital. The findings indicate that lifestyle, particularly tobacco use, may significantly contribute to the development of ameloblastoma. Predominance was among male, middle-aged individuals, and a strong association was observed between both smoking and tobacco consumption. Male predilection was observed with ratio of about 4:1. Same results with male predilection was found in South Asian and African populations (Arotiba et al., 1997; Fregnani et al., 2010; Reichart et al., 1995).[11, 12, 13] Males are more likely to be exposed to environmental and behavioural risk factors, such as tobacco use and work practices, which has been linked to the gender gap. The current study did not find a statistically significant association between gender and ameloblastoma; however, the observed tendency is consistent with previous research.

The age distribution showed that middle-aged people predominated, with the majority of patients falling into the 40–60 age range. Ameloblastoma appears earlier in maturity, according to a strong negative link between age and the disease. Luo et al. (2022) and Hertog et al. (2011),[14,15] showed similar age patterns, with peak incidence occurring in the fourth and fifth decades. Ameloblastoma's sluggish growth and locally aggressive character may cause a delay in clinical discovery, resulting in a middle-aged diagnosis.

While there was a strong correlation between gender and occupation, occupational position did not show a significant link with ameloblastoma. This finding is consistent with research on maxillofacial tumors and mouth cancer in poor nations, where occupation is more of a surrogate marker for behavioral and socioeconomic

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characteristics than a separate risk factor (Anwar et al., 2020; Adebayo et al., 2005).[16]

The current investigation found a considerable positive link between smoking and ameloblastoma. Although smoking is a known risk factor for oral squamous cell carcinoma, its impact on odontogenic tumors is less well understood. However, new research indicates that carcinogens linked to tobacco use may cause long-term inflammatory reactions and molecular changes in odontogenic epithelium, which may contribute to the development of tumors (Effiom et al., 2018; Chrcanovic & Gomez, 2017).[17, 18] The high correlation found suggests that smoking has a role in the development of ameloblastoma.

The high frequency of chewable tobacco use and its strong correlation with ameloblastoma are among the study's noteworthy findings. Carcinogenic compounds including areca nut alkaloids and nitrosamines, which have been linked to oral mucosal and maxillofacial problems, are found in products like gutka, naswar, and chalia (IARC, 2004; Gupta et al., 2019).[19, 20] Regional studies from South Asia have found similar links between smokeless tobacco use and aggressive oral lesions or jaw malignancies (Buchner et al., 2006; Effiom et al., 2018).[21] Long-term exposure of odontogenic tissues to these compounds may have an effect on the pathophysiology of ameloblastoma, according to the substantial association found in this study.

Additionally, there was a significant correlation between the severity of chewable tobacco use and the incidence of illness, suggesting a potential dose-dependent link. Studies looking at oral possibly malignant disorders and jaw lesions have shown that prolonged and frequent exposure may increase cytotoxic and genotoxic effects on odontogenic remnants (Madathil et al., 2016; Anwar et al., 2020).[22] Gender and occupation did not independently correlate with ameloblastoma, despite the relationships that were found. The results indicate that lifestyle-related factors, particularly tobacco consumption, may exert a stronger influence than demographic characteristics alone. This highlights the importance of implementing effective smoking cessation interventions, with special attention to populations at increased risk.

A limited sample size and a lack of comprehensive data on the duration and cumulative exposure to tobacco products are two of the study's shortcomings. Furthermore, it is difficult to reach firm conclusions about cause-and-effect linkages due to the cross-sectional research design. However, the systematic assessment of tobacco use and the inclusion of histopathologically validated diagnoses improve the findings' reliability.

CONCLUSION:

Ameloblastoma accounted for 20.2% of all odontogenic lesions, and roughly 79% of afflicted individuals were middle-aged men. Tobacco use was often found in this population, as 75.5% of patients indicated the use of smokeless tobacco and 22.3% reported active smoking. Both smoking ($p < 0.01$) and smokeless tobacco usage ($p < 0.05$) demonstrated statistically significant relationships with ameloblastoma, while gender and employment did not independently correlate with disease incidence. These findings underscore the need for targeted tobacco cessation measures and early screening initiatives in high-risk groups and suggest that tobacco exposure may be a significant factor in the development of illness.

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