



Geriatric Oral Ulcers: Frequency and Major Risk Factors

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ABSTRACT

Introduction: The oral epithelium provides a protective barrier to injuries. Not only the aging process but some systemic conditions cause atrophy of oral epithelium making it sensitive to mechanical injuries and the occurrence of oral lesions. Recognition and proper cure of oral lesions are important for the quality of life of geriatric and crucial parts of total oral health care.

Aims & Objectives: To investigate the frequency and knowledge of oral ulcers among Geriatrics, and its relations with age, gender, educational level and co-morbidities.

Place and Duration of Study: Data was collected from Dental OPD Bolan Medical Complex Hospital BMCH in Quetta and Old age home (Adara-e-Behbood-e-Umar Rasida) from August to September 2024.

Materials & Methods: Ethical approval from Bolan University of Medical and Health Sciences (BUMHS) Quetta, and consent from patients was obtained. A cross-sectional study was carried out on 220 geriatric patients (106 males, 114 females) aged 60 years and above through convenient sampling. Data was collected through a proforma. For analysis frequency and percentages were calculated. SPSS software (Version 22.0) was used.

Results: The majority (89.09%, 196/220) of the participants experienced varying frequencies of ulcers previously, 31.36% (n=69/220) were 71-80 age range whereas 79.54% of the participants were residents of Quetta (n=175/220). Participants who completed intermediate education were 28.18%, 17.27% completed higher education and the remainder had no formal education (13.63%). Some experienced ulcers once a month (7%), others (92%) reported several episodes per year, and 1% experienced ulcers sometimes. Almost half (46.36%) had knowledge about ulcer treatment, 34.45% had limited knowledge, 47.27% got information from their family and friends, and 40.90% acquired it from doctors.

Conclusion: Oral ulcers among geriatrics are related to age, gender, and gut disorders. Study participants demonstrate less knowledge regarding the treatment of oral ulcers and need care and cure for their oral problems and their related complications.

Keywords: Oral ulcers, Geriatric, gender distribution, educational level.

INTRODUCTION

A person aged 60 or above is regarded as elderly.¹ In our families these pre-old age and elderly cannot enjoy food peacefully may be due to them suffering from oral ulcers. An oral ulcer can be defined as a break in the protective mucosal epithelium of the mouth caused by several causes and presenting with inflammatory symptoms.¹ It is quite common in the elderly population with the main issue being low or impaired immunity.² Cellular changes in geriatrics demonstrate atrophy of oral epithelium and a decrease in collagen synthesis in the connective tissue. This minimizes the protective function of

oral epithelium, thus increasing the chance of oral mucosal diseases. Making oral mucosa permeable to harmful substances and more vulnerable to pathogenic micro-organisms.¹ Age-related metabolic changes² neoplasia and infectious diseases are the possible factors initiating unfavorable conditions for oral mucosa to develop ulcers.¹ Furthermore the elderly can also suffer from ulcers due to several systemic diseases, long-term medications, dietary deficiencies, prosthesis-related trauma¹ and tobacco or alcohol consumption.⁴ On the other hand stress ulcers are common in females.⁵ Oral and denture hygiene might be the culprit of oral mucosal lesions.⁶ Educated elderly population, though able to recognize the importance of maintaining oral hygiene might not be able to do so with the sole reason being major cognitive impairment/dementia that increases with age among them.⁷ On the whole psychiatric disorders have shown a causal relation with oral ulcers.⁸ Gender and educational level may also be considered as predisposing factors of oral ulcers in the elderly population⁹ which is not discussed in length nationally and internationally.

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Oral health status is important for the quality of life, owing to physical, social and psychological factors.¹⁰ Oral ulcers render the geriatric population unable to eat and speak properly and occasionally point to more disturbing findings in the future (such as systemic diseases or cancer).⁴ Therefore, the significance of the topic lies in the prevention of oral ulcers via creating public awareness, early detection and treatment by dental practitioners to improve the quality of life and aid in the attainment of quality aging. This study aims to determine the frequency of oral ulcers and their relation to gender, age, level of education and major diseases including hypertension, diabetes mellitus and gut disorders. It also highlights the level of knowledge about oral ulcer treatments among the geriatrics.

MATERIALS AND METHODS

Study Design: A cross-sectional study

Study Setting and Duration: Data was collected from Dental OPD Bolan Medical Complex Hospital (BMCH), Quetta and an old age home Adara-e-Behbood-e-Umar Rasida (ABURO) during August and September 2024.

Ethical Approval: Ethical approval was obtained from Bolan University of Medical and Health Sciences (BUMHS), Quetta, (IRB No. 0042/BUMHS/24, Dated: 28.9.24).

Study Population:

Inclusion Criteria: Subjects aged 60 and older, having a history of or acutely presenting with oral ulcers and ready to participate in the study were recruited.

Exclusion Criteria: Individuals with cognitive impairment or communication difficulties were excluded from the study.

Sample Size: A total of 220 participants were selected.

Sample Collection Formula: the formula used was:

$$n = Z^2 \times p \times (1 - p) / e^2$$

n=required sample number

z=1.9Zfor a 95% confidence level)

p=0.10(estimated population of participants with oral ulcers)

e=0.10 (margin of error).

Sampling Technique and Procedure: Simple convenient sampling was used. After confirming confidentiality and obtaining informed consent (Annexure I), demographic data including age, gender, education level and residence was collected from dental OPD, Bolan Medical Complex Hospital, Quetta and Old Age Home ABURO, Quetta. Participants were also asked about the frequency of oral ulcer development, any diagnosed medical

conditions and their knowledge about ulcer treatment together with its source.

Data Collection Tool: Proforma

Data Collection Procedure: Data was gathered through a proforma filled by 220 participants. The demonstrator filled out the proforma by asking questions to the participants visiting Dental OPD in Bolan Medical Complex Hospital and old age home ABURO in Quetta, Pakistan.

Analysis: Frequency and percentages were calculated for descriptive data. Age was described by using Mean± standard deviation and gender was described by using frequency and percentage. SPSS software (Version 22.0) was used for analysis.

RESULTS

In the current study, half of the participants were females (51.81%, 114/220). Forty-seven point two percent (47.2%) were within the age range of 60-70 years (104/220) and mostly residing in Quetta district (78.2%). The demographic view of the participants consisting of their gender-wise distribution, age, residence, and educational level are displayed in Table 1.

Table 1: Demonstrating Frequencies of Demographic Variables and Types of Oral Ulcers among Study Participants

Demographic View of the Study Participants	Percentage% (n=)
Gender	
Male	48.18 (106)
Female	51.81(114)
Age of Study Participants	
60-70 years	47.2 (104)
71-80years	35.5 (78)
81-90 years	10 (22)
Above 90 years	7.3 (16)
Mean SD	72.28±10.09
Residence of Study Participants	
Quetta	79 (175)
Out Side Quetta	21 (45)
Educational Level Of Study Participants	
Primary (grade 1-5)	15.9 (35)
Secondary (grade 9-10, high school)	26.4 (58)
Intermediate (grade 11-12)	28.18 (62)
Higher Education (graduation)	17.27 (38)
Illiterate	13.63 (30)
Type of Oral Ulcer	
Acute	31.82 (70)
Chronic	68.18 (150)

A majority (92%) of the subjects reported that they had developed oral ulcers in the past while very few of them (1%) demonstrated not many oral ulcers. The frequency of oral ulcers among the targeted population is presented in Bar Chart 1 (Figure 1). Knowledge of treatment for oral ulcers are given in Table 2. It also specifies the source of this knowledge. Table 2 presented that more than half of the study participants didn't have any knowledge about the treatment of oral ulcers, and 47.7% of them having enough or little knowledge described the source as their family and friends.

Figure 1: Bar Chart Presenting Frequency of Oral Ulcers among Study Participants

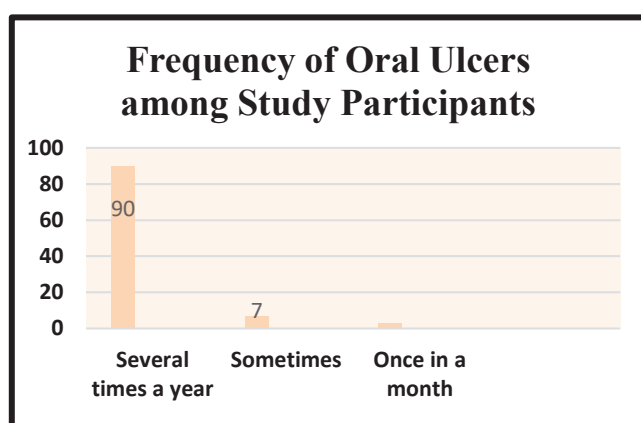


Table 2: Knowledge about and Source of knowledge about Oral Ulcers and its treatment

StudyParticipants Knowledge about the Treatment of Oral Ulcers Percentages(n)		
S. No	Somewhat knowledgeable	46.36 (102)
1	Not enough knowledge	35.45 (78)
2	Very Knowledgeable	18.18 (40)
Source of knowledge about ulcer treatment among elderly		
1	Family and friends	47.27 (104)
2	Doctors	40.90 (90)
3	Internet/social media	7.2 (16)
4	Traditional healers	4.1 (9)

DISCUSSION

The findings of this study highlight the frequency and treatment knowledge of oral mucosal ulcers among participants aged 60 and above. Six percent of the Pakistani population is above the age of 60 years including 40% of households and older individuals.¹¹ Of these participants 60-70 age group was more prone to oral ulcers, similarly Indian population of this age group demonstrates oral ulcers.¹² Results of the current study are similar to the results of other studies where the majority of the study participants were above the age of 60.^{6,14} A considerable number of people are at older ages both in developed and developing countries which increases the chance of dementia or Parkinson's disease in these subjects.¹³ In addition, observational studies suggested that if elderly subjects are affected with Psychiatric disorders then they are at high risk of developing oral ulcers.⁸ However, the exact cause of oral lesions is not known despite that, due to impaired or low immunity there is an increased chance of occurrence of systemic diseases, age-related metabolic changes, and nutritional deficiencies, infectious diseases (fungal or viral origin). Elderly subjects are usually under long-term medications for systemic diseases, wear prostheses and might have deleterious habits like tobacco or alcohol. All these factors cause adverse effects on oral mucosa that may cause initiation of oral ulcers.¹ Another cause of oral lesions is seen in subjects above the age of 40 years, there is a continuous decrease in homeostatic control, and subjects above this lose the ability to respond to stress and change. Females are more prone to oral lesions (ulcers) Zou in 2024 detected more than half of the affected population was female (n=784/1543, 51%).¹⁵ Same results were detected in the current study where half (51.81%, 114/220) of the study participants were females. However, the reverse is seen by Cheruvathoor DD in his study where male patients suffering from oral ulcers are predominant (p<.001). The cause of this study participant's oral ulcer is dentures.¹² A reason behind the occurrence of oral ulcers in females may be stress that females suffer more than males and emotional circumstances that imbalance their immune system.¹² Or because of hormonal changes seen in females causing oral mucosal ulcers.¹⁵ During research, acute and chronic types of ulcers were detected. Acute form is the cause of accidental oral mucosal biting or ingestion of hot food or drink that produces sudden onset, of oral ulcers with sharp pain and its duration is short. Clinically it presents a white or yellowish central clear area with an

erythematous halo^{16,17} and is the response of trauma, recurrent aphthous stomatitis and infections associated with viruses or bacteria.^{17, 18} On the other hand, the chronic type of ulcers are associated with sharp tooth edges and ill-fitting dentures, typically present with a gradual onset or slow progression if left untreated or stay more than one month is associated with oral cancer and typically present with a gradual onset or slow progression.¹⁹ It is characterized by a shallow or deep disruption of the epithelium, often accompanied by peripheral keratosis, and may be either symptomatic or asymptomatic.²⁰ In the current study majority of the participants suffer chronic forms of oral ulcers (n=150/220, 68.18%). Research work on this variable was almost absent to compare with current study results, however, long-standing ulcers are classified as chronic ulcers²¹ that occur due to continuous use of prosthesis,¹⁶ systemic disorders,⁴ medications,²² nutritional deficiencies¹⁰ and another most prevalent causes is the thinning of oral mucosa a major etiological factor of oral ulceration.² Participants in formed their experience of ulcers, frequency of ulcers, knowledge about oral ulcer treatment and where they get information for ulcer treatment. The reason for their continuously developing ulcer is due to oral mucosal changes with increasing age, such as atrophy of oral epithelial, decreased mitotic activity and ability of the tissue to regenerate, a limited cellular density and diminished collagen and elastin in older patients.² Whereas due to illiteracy patients were unaware of the severity and complications of oral ulcers, thus getting information about treatment from their friends, family members, net and very few contact doctors for this purpose.

Notably, the results demonstrated a high overall prevalence of oral ulcers (92%) in the participants suggesting that aging may increase the general susceptibility to oral lesions.

The oral cavity may undergo physiological changes as people age where the mucosa becomes less protective and more susceptible to oral lesions. Due to their physiological changes, elderly people are more likely to have systemic conditions.²³ The trillions of bacteria that have settled in mammals' digestive tracts are referred to as the gut microbiome.²⁴ Studies proposed a relationship between oral and systemic inflammatory status, microbiome, and oral dysbiosis, which directly and/or indirectly promote the onset and advancement of systemic illnesses.²⁵ One promising method for both preventing and treating inflammatory illnesses has been to target the gut flora. According to certain research, gut flora plays

a crucial part in the treatment of mouth ulcers. Studies revealed any imbalance in gut microbiota can lead to the occurrence and development of hypertension and inversely hypertension affects microbiota.²⁵ Research done on animals proves fecal microbiota transplantation or supplement of specific gut microbes can effectively change their blood pressure.²⁵ Some of the gut biota affect positively during oral ulceration (Class Actinobacteria), whereas others enhance oral ulceration (Genus Oxalobacter, Genus Ruminococcaceae, Genus Holdemedia).²⁴ Disabilities impact a person's quality of life even though they are not life-threatening. In the case of Gastrointestinal disorders (Ulcerative Colitis, Crohn's Disease and colitis) there is defective intestinal mucosal barrier functions and/or abnormalities in the mucosal immune system are present. Intestinal epithelial cells undergo aberrant apoptosis or para-cellular connections malfunction, and luminal microorganisms and antigens may inappropriately invade the lamina propria, resulting in aberrant mucosal immune responses and a compromised mucosal barrier.² In the current study 26% (n=58/220) of elderly subjects suffer from gastrointestinal problems, which may be due to alteration in gut microbiota due to hypertension or Gastrointestinal disorders (inflammatory bowel disease, chrons disease, celiac disease). Further Cohort Studies are needed to assess the etiology of oral ulcers related to GI disorders. On the other hand, 14% (n=31/220) of them presented hypertension it may also be interrelated with altered gut microbiota which as we recognized can cause high blood pressure and present oral mucosal changes in the form of oral ulcers. This may also need to be assessed further in randomized clinical trials to confirm the role of microbiota between hypertension and the occurrence of oral ulcers.

The process used in this study yields evidence that is persuasive, verifiable, and well-argued. It also uses a significant sample size of 220 senior citizens, which increases the findings' dependability. In this study, the elderly population of our society is selected to detect their oral lesions and assess and discuss them in detail, which is unique. Despite its strengths, the study has notable limitations. There may be potential bias in sample selection, which could affect the generalizability of the results. The presence of outliers could distort the findings, impacting the overall interpretation. Additionally, the study's focus on specific aspects may overlook broader contextual factors that could be relevant to the research question. However, bias may occur due to samples collected from only one center and other hospitals are not included in the study. Further

multicentric studies can be done with increasing sample size.

Recommendations: Future research should consider longitudinal designs to track changes and establish causal relationships over time. Collaborations across different disciplines could enrich insights into the topic. Additionally, incorporating qualitative methods, such as interviews or focus groups, would allow for a deeper exploration of participants' perspectives and experiences. To improve the study's validity, it is recommended to broaden the sample size and include a more diverse population, which would enhance generalizability. Conducting sensitivity analyses to address the impact of outliers would also be beneficial. Furthermore, expanding the research scope to incorporate additional variables could provide a more comprehensive understanding of the topic. Future research could further explore the impact of specific lifestyle factors and systemic diseases on oral health in aging populations to inform more tailored interventions.

CONCLUSION

Oral ulcers were a prevalent issue among the geriatrics. Though gender may play a role in the occurrence of many oral and general diseases, age and gender were not statistically significant predictors of oral ulcers in this study. The high prevalence of oral lesions and the role of systemic conditions call for comprehensive oral healthcare strategies targeting geriatrics.

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