

Diagnosis of Chronic Oral Ulcer: Knowledge and Practice among Dental Undergraduates in a Tertiary Care Hospital of Koshi Province

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Abstract

Background: Chronic oral ulcer is a common complain addressed in dental OPD, associating wide variety of pathologies. The presentation might relate to traumatic exposure, reactive lesion, infectious condition or a malignancy. Diagnosis of chronic oral ulcer requires, comprehensive knowledge and ability to associate various factors evaluated during practice with the list of differentials. This study aimed to assess the knowledge and diagnostic practice of dental undergraduates regarding oral ulcer.

Methods: A cross-sectional study was carried out among 134 dental students. A validated questionnaire was distributed to all the students from third year till interns. The knowledge was evaluated in the form of mean score whereas the practice skill was categorized in the terms of Likert Five-point scale.

Results: Among 134 participants, 64 were males and 70 were females. The overall mean and median score of knowledge was 15.26 ± 2.88 and 15.5 respectively. The score for third years was 15.61 ± 2.23 which was highest among all. More than 50% of the students practice a standard diagnosing technique for chronic oral ulcer.

Conclusions: The study showed almost half of the students with good level of knowledge in diagnosing chronic oral ulcer and follow a standard practice. Every chronic oral ulcer should be carefully evaluated for oral cancer, without overlooking on to the possibilities for other differential diagnosis. Learner-centered educational approach is the present need for dental education system.

Keywords: Dental students; Differential diagnosis; Oral ulcer

Declarations

Ethics approval and consent to participate: This study was conducted with prior ethical approval from Institutional Review Committee, BPKIHS, and informed consent has been obtained from participants prior to the enrollment.

Consent for publication: Informed consent was obtained.

Availability of data and materials: The full data set supporting this research is submitted to the journal.

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BACKGROUND

A non-healing oral ulcer persisting for more than two weeks are chronic [1]. Chronic oral ulcer often has diagnostic challenges because of diversity in etiology and overlapping clinical presentation [2]. It results from long-standing traumatic exposure, infectious condition like syphilis, tuberculosis, oral cancer, fungal infection or might be a presentation with unknown etiology [3-6].

Undergraduate dental students are the future oral health experts, handling the case independently. In addition to good level of knowledge and adapting to a standard basic examination practice, students should also have an ability to critically analyze the clinical presentation and relate it to the most significant diagnosis. This ability of an undergraduates can be evaluated while diagnosing chief complain like oral ulcer, a common presentation to many pathologies based on knowledge and practice. This study aimed to assess the knowledge and diagnostic practice of dental undergraduates regarding oral ulcer.

METHODS

A cross-sectional study was conducted among undergraduate dental students at college of dental surgery, B.P. Koirala Institute of Health Sciences, Nepal. The study was reviewed and approved by Institutional Ethical Committee (IRC/2098/021). A convenience sampling technique was used as per the availability of the targeted student (third year, fourth years, fifth year and intern) directly involved in diagnosis of chronic oral ulcer during the study period. The consent was obtained. The questionnaire was distributed among 180 dental students.

Questionnaire

A proforma was deigned that included demographic details like age, sex and year of study. It also included close-ended multiple-choice questions (MCQs); ten for knowledge and seven for practice assessment based on cases encountered to the department and literature review [2-4,7,8]. These questions were related to history, clinical examination, investigation and diagnosis of chronic ulcer. All the knowledge assessment questions had multiple correct responses except question number 1, 2 and 6. The knowledge-based question was validated (content) with expert in the field. A pilot study was conducted on ten undergraduate dental students for the evaluation of time estimation, completeness of questions and to check the reliability of the practice questions. The practice questionnaire was recorded on five-point Likert's scale as-

almost never, once in a while, sometimes, often and almost always" which showed Cronbach's alpha of 0.86. The data from pilot testing were not included in the final study sample.

Statistical Analysis

The data were entered in Microsoft Excel 2013, and analyzed using SPSS version 20. Demographic details were analyzed using descriptive statistics. Mean score was calculated for individual student as-each correct option, ticked right by the participant was scored as "1", and "0" for wrong option (if checked as right) with the score rage of 0-26. Number of participants with correct response were presented in the form of number and percentage. Median score of participants of individual years was also calculated and compared using Kruskal-wallis test with a significance level of less than 0.05. Findings were presented in the form of tables.

RESULTS

Out of the total 180 dental undergraduates, only 134 responded to the questionnaire and the response rate was 74.44%. Of total 134 students, the majority of the participants were (n=70, 52.23%) females. The average age of the participants was 23.74 ± 1.75 years with range of 20-26 years.

Appreciably, 98 (73.12%) students were aware that the traumatic ulcer is the most common oral ulcer. When asked about chronic ulcer over a period of three to four weeks, 114 (85.07%) students said it to be of oral malignancy with least response for oral eosinophilic ulcer 17 (12.68%).

Regarding knowledge on induration in chronic oral ulcer, most of the students correctly reported for oral malignancy; 107 (79.85%). However, few of them knew that even traumatic ulcer; 26 (19.40%), and eosinophilic ulcer; 17 (12.68%) could show an induration. The students were aware, that the lymphadenopathy in oral ulcer could be either due to infectious condition; 16 (86.56%), or due to metastasis; 111 (82.83%). Moreover, secondary infection, trauma and sudden enlargement of malignant lesion were respectively answered by 108 (80.59%), 76 (56.71%) and 62 (46.26%) students as a cause of pain in oral ulcer.

A total of 123 (91.79%) students were aware about biopsy as a gold standard for diagnosing non-healing ulcer of oral malignancy, yet, only 45 (33.58%) students knew that oral eosinophilic ulcer is also confirmed with biopsy. More than two-third; 104 (77.6%) of the students knew malignant oral ulcer is non-contagious (Table 1).

Table 1: knowledge of participants on non-healing chronic oral ulcer (n = 134)

S. No	Question	3 rd Year n (%)	4 th Year n (%)	5 th Year n (%)	Intern n (%)	Total n (%)
1.	Traumatic oral ulcer is the most common oral ulcer.					
	a. Yes	30 (76.9%)	11 (50.0%)	27 (84.37%)	30 (73.1%)	98 (73.13%)
	b. No	9 (23.07%)	11 (50.0%)	4 (12.5%)	10 (24.39%)	34 (25.37%)
	c. Do not know	0	0	1 (3.12%)	1 (2.43%)	2 (1.49%)
2.	Which of the following is true about edge of the oral ulcer?					
	a. Sloping edge is mostly associated with tubercular ulcer	7 (17.94%)	0	7 (21.87%)	2 (4.87%)	16 (11.94%)
	b. Punched out edge is mostly associated with traumatic ulcer	4 (10.25%)	5 (22.72%)	5 (15.62%)	8 (19.51%)	22 (16.41%)
	c. Undermined edge is mostly associated with basal cell carcinoma	2 (5.12%)	0	2 (6.25%)	3 (7.31%)	7 (5.22%)
	d. Raised edge is mostly associated with NUG (Necrotizing Ulcerative Gingivitis)	3 (7.69%)	1 (4.5%)	0	2 (4.87%)	6 (4.47%)
	e. Rolled out and everted edge is mostly associated with oral malignancy	23 (58%)	16 (72.72%)	18 (56.25%)	26 (63.411%)	83 (61.94%)
3.	Induration in the margin and base of chronic non-healing oral ulcer may be a feature of,					
	a. Oral malignancy	29 (74.35%)	19 (86.36%)	24 (75%)	35 (85.36%)	107 (79.85%)
	b. Oral vesicobullous lesion	4 (10.25%)	5 (22.72%)	5 (15.62%)	2 (4.87%)	16 (11.94%)
	c. Oral syphilitic ulcer	33 (84.61%)	9 (40.90%)	9 (28.12%)	17 (41.46%)	68 (50.74%)
	d. Oral eosinophilic ulcer	11 (28.20%)	0	5 (15.62%)	1 (2.43%)	17 (12.68%)
	e. Traumatic ulcer	7 (17.94%)	2 (9.09%)	4 (12.5%)	13 (31.70%)	26 (19.40%)
4.	Lymphadenopathy is suggestive of,					
	a. Infectious condition	33 (84.61%)	21 (95.45%)	29 (90.62%)	33 (80.48%)	116 (86.56%)
	b. Malignancy associated with metastasis	33 (84.61%)	16 (72.72%)	29 (90.62%)	33 (80.48%)	111 (82.83%)
	c. Is an independent clinical presentation	8 (20.51%)	4 (18.18%)	8 (25%)	4 (9.75%)	24 (17.91%)
5.	Pain in a chronic non-healing oral ulcer may represent.					
	a. Trauma (physical/ chemical/ mechanical)	27 (69.23%)	9 (40.90%)	21 (65.62%)	19 (46.34%)	76 (56.71%)
	b. Secondary infection	29 (74.35%)	13 (59.09%)	30 (93.75%)	36 (87.80%)	108 (80.59%)
	c. Sudden enlargement of malignant lesion	18 (46.15%)	11 (50.0%)	15 (46.87%)	18 (43.90%)	62 (46.26%)
6.	Chronic non-healing oral ulcer over a period of 3-4 weeks is associated with oral cancer.					
	a. Always	1 (2.56%)	6 (27.27%)	5 (15.62%)	5 (12.19%)	17 (12.68%)
	b. Never	3 (7.69%)	1 (4.5%)	0	1 (2.43%)	5 (3.7%)
	c. Sometimes	35 (89.74%)	15 (68.18%)	27 (84.37%)	35 (85.36%)	112 (83.58%)
7.	Chronic non-healing oral ulcer over a period of 3-4 weeks can be suspected for,					
	a. Traumatic ulcer	12 (30.76%)	6 (27.27%)	15 (46.87%)	17 (41.46%)	50 (37.31%)
	b. Oral malignancy	31 (79.48%)	19 (86.36%)	28 (87.59%)	36 (87.80%)	114 (85.07%)
	c. Infectious diseases/ Systemic diseases	36 (92.30%)	18 (81.81%)	20 (62.5%)	26 (63.41%)	100 (74.62%)
	d. Vesicobullous lesion	12 (30.76%)	6 (27.27%)	5 (15.63%)	13 (31.70%)	36 (26.86%)
	e. Oral eosinophilic ulcer	0	6 (27.27%)	4 (12.5%)	7 (17.07%)	17 (12.68%)

S. No	Question	3 rd Year n (%)	4 th Year n (%)	5 th Year n (%)	Intern n (%)	Total n (%)
8.	What are the investigations that can be suggested for chronic non-healing oral ulcer?					
	a. Blood investigation	18 (46.15%)	16 (72.72%)	20 (62.5%)	31 (75.60%)	85 (63.43%)
	b. X-ray	8 (20.51%)	9 (40.90%)	7 (21.87%)	4 (9.7%)	28 (20.89%)
	c. Smear preparation	26 (66.66%)	16 (72.72%)	19 (59.37%)	19 (46.34%)	80 (59.70%)
	d. Biopsy	38 (97.43%)	19 (86.36%)	28 (87.5%)	38 (92.68%)	123 (91.79%)
	e. Immunofluorescences	23 (58.97%)	10 (45.45%)	22 (68.75%)	27 (65.85%)	82 (61.19%)
9.	Biopsy is gold standard technique for					
	a. Oral malignancy	31 (79.48%)	20 (90.90%)	31 (96.87%)	41 (100.00%)	123 (91.79%)
	b. Oral tubercular ulcer	16 (41.02%)	13 (59.09%)	11 (34.37%)	4 (9.75%)	44 (32.83%)
	c. Oral syphilitic ulcer	14 (35.89%)	8 (36.36%)	11 (34.37%)	3 (7.31%)	36 (26.86%)
	d. Oral eosinophilic ulcer	13 (33.33%)	6 (27.27%)	16 (50.00%)	10 (24.39%)	45 (33.58%)
10.	Which of the following is not a contagious chronic non-healing oral ulcer.					
	a. Oral malignancy	30 (76.92%)	18 (81.81%)	23 (71.87%)	33 (80.48%)	104 (77.61%)
	b. Oral tubercular ulcer	10 (25.64%)	1 (4.5%)	5 (15.62%)	7 (17.07%)	23 (17.16%)
	c. Major recurrent aphthous ulcer	23 (58.97%)	15 (68.18%)	16 (50.00%)	21 (51.21%)	75 (55.97%)
	d. Oral syphilitic ulcer	11 (28.20%)	1 (4.5%)	6 (18.75%)	5 (12.19%)	23 (17.16%)

Bold figure represents correct answers, frequency and percentage

Regarding practice of non-healing chronic oral ulcer, most of the students inquired about the duration; 119(88.8%) and habit history; 121(90.29%). Similarly, evaluation of margin was almost always done by 84(62.68%) students.

Half of the students palpated for sharp cusp, denture borders while examining chronic oral ulcer. Suggestion for cytology was least into practice (**Figure 1**).

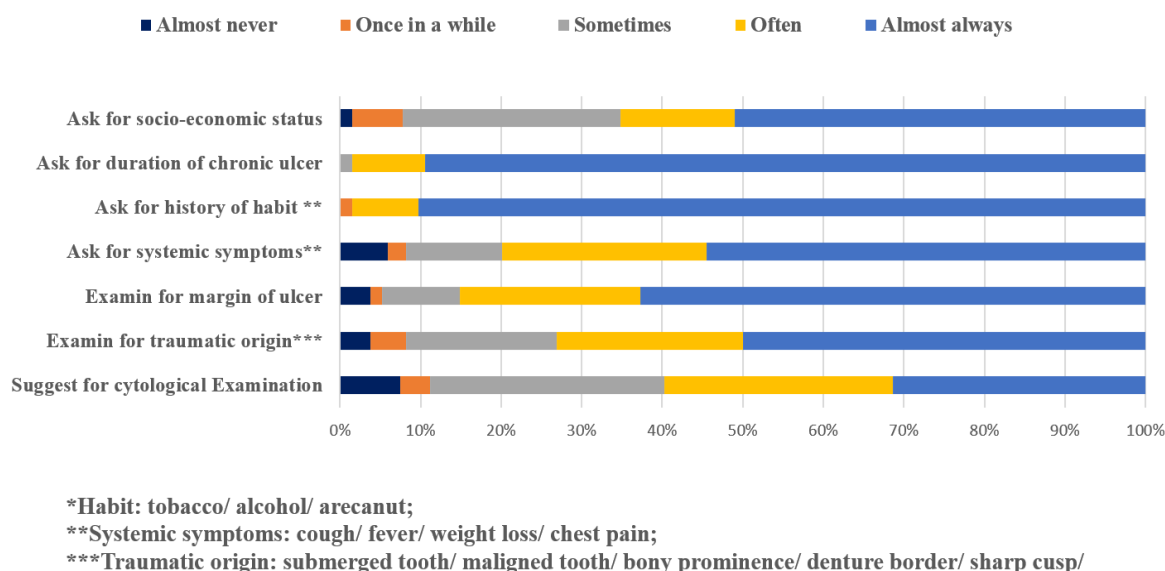


Figure 1: Response of Practice (frequency %) on diagnosing chronic oral ulcer.

The overall percentage mean score for correct response on knowledge was 58.03% and the highest score (60.03%) was seen among third year (Table 2).

Table 2: Median score for correct response of knowledge on chronic non-healing oral ulcer

Year	Number (Percent- age %)	Mean %	Median	IQR	P- value*
3rd year	39 (29.10)	60.03	16	18-14	0.77
4th year	22 (16.41)	56.96	15	17-13	
5th year	32 (23.88)	59.11	16	17-13	
Interns	41 (30.59)	58.03	16	17-13	
Total	134 (100)	58.69	15.50		

*Kruskal-Wallis's test

Based on grading system of our institution, score of 134 students were categorized, which showed almost half of the students with good and above level of knowledge (Table 3).

Table 3: Grading of undergraduate students based on percentage score of knowledge on non-healing chronic oral ulcer

Percentage of score	Classification/ Division	Number (%)
75% and above	Very good	7 (5.2%)
60%-74.99%	Good	60 (44.77%)
50%-59.99%	Fair	47(35.07%)
Less than 50%	Poor	20 (14.92%)

DISCUSSION

Chronic ulcer is a common clinical presentation for several pathologies of diverse etiology. Clinical examination and investigation pave a path for final diagnosis. However, correlating clinical finding to specific pathology thereby excluding the non-specific, required lateral thinking and practice. Perceiving this, the study was conducted to evaluate the ability of the dental undergraduates to diagnose a chronic oral ulcer based on knowledge and practicing skill. The response rate of the above study was only 74.44% which was mainly because of students were occupied with internal and supplementary examinations.

Present study showed that 44.77% of undergraduate students have good and 5.2% with very good knowledge regarding chronic non-healing oral ulcers. Mode of education in most of the dental institution, our being no exception is through didactic lectures. The knowledge is disseminated passively to the students by the teacher thereby limiting the opportunity of the students to develop lateral thinking and critical appraisal which might be the reason for low level of knowledge of our students. At least 50%

of students (students responding almost always) in present study follows standard practice which is appreciable. However, the gap observed in present study between level of knowledge and standard practice is alarming. Despite their practice is standard they lag the ability to correlate the factors assessed during examinations of oral ulcer to particular pathology. The finding suggests a potential need for enhanced learner-centered educational approaches, which should be explored in future studies [9].

The present study showed more than three-fourth of the students were able to associate chronic oral ulcer as oral cancer on the basis of duration, risk factor, presence of lymphadenopathy, indurated margins, and biopsy as gold standard for diagnosis. The result corresponds to many studies evaluating dental student knowledge on oral cancer [10-12]. Oral cancer is the diseases of global concern and is one among the five most common malignancy in Nepalese population [13,14]. Early diagnosis plays a major role in improving the prognosis of the diseases [11]. Dentist, an oral health expert might be the first to witness an oral ulcer suspicious for malignancy. Hence, it is utmost important that our dental undergraduates are trained enough for comprehensive handling of the cases suspected for oral cancer.

Around 90% of the students in present study inquire on habit history for risk factor like tobacco, alcohol and arecanut. Similar result was found by Gunjal et al [12], however, contrasted with the finding of Bhagavathula et al, where the dental students showed gap in the knowledge regarding risk factors for oral cancer [15]. Tobacco and alcohol are the prime etiologies behind oral cancer [12,16]. Every person suspected to have oral cancer should be enquired about habit history for risk factors. World health organization (WHO) says 1.3 billion people in the world uses tobacco with highest prevalence (31%) in south-East Asia including Nepal [17]. Use of tobacco and alcohol is very common in present world henceforth, any patient presenting with chronic non-healing oral ulcer with a history of habit would definitely be suspected for an oral cancer but would not rule out the possibility for the incidence of other differentials like traumatic or infectious or eosinophilic ulcer.

More than 70% of our undergraduates knows that, traumatic ulcer is the most common oral ulcer, yet, only 50% of the students examine for sharp cusp, misaligned teeth, denture border, bony prominence. Traumatic oral ulcers, in absence of traumatic history and because of its clinical resemblance to malignant oral ulcer, are suggested for biopsy to establish the diagnosis. Efficient palpation establishes the traumatic cause thereby reducing over-treatment, often done in a chronic oral ulcer not associated

with oral malignancy [5,7,18].

Chronic oral ulcer over a period of 3-4 weeks might be a clinical presentation of many other pathologies apart from oral cancer; infectious/systemic diseases is one among them [2,4], as reported by more than 70% of our students. Infectious diseases like tuberculosis may present with systemic manifestation-like cough, fever, weight loss, chest pain etc. [6]. However, only half of the students inquire for it.

Only 12.68% of students could associate non-healing ulcer over 3-4 weeks with indurated margin as eosinophilic ulcer. However, 33.68% knew that biopsy is gold standard for diagnosis. The knowledge on to these differentials was least among our undergraduates. At our institution, conducting biopsy and its follow-up is primarily assigned either to the residents or to the faculties, which might be one of the reasons for limited exposure leading to limited knowledge.

Oral eosinophilic ulcer also designated as “traumatic ulcerative granuloma with stromal eosinophilia (TUGSE)” is an inflammatory reactive lesion of unknown etiology. They are self-limiting but might takes from weeks to year to heal and hence, usually suspected for oral cancer [2,19]. The histopathology shows mixed inflammatory cell infiltrates predominantly eosinophils [19]. The lesion often comes into picture when, histopathological finding does not correspond to the clinical finding for oral malignancy and the lesion accelerates to heal after biopsy intervention [20].

Present study also showed that 17.16% of the students do not have knowledge about the contagious nature of oral tuberculous and syphilitic ulcer. Despite small in percentage, this lag in knowledge might create a major hazard on the working environment. Both primary and secondary stage of syphilis is highly contagious. Dentist are the professionals at high risk of non-sexual transmission through contaminated blood and saliva [8,10]. Similarly, tuberculosis is another infectious disease that cross-infect through aerosol [4,10]. Oral manifestation of tuberculosis is characterized by painful solitary ulcer with undermined

edge, and induration [2,6]. Oral manifestation can be the first and probably the only sign for the diagnosis [8]. Hence, these diseases must be foregrounded for every dental graduate, both for its diagnosis and to avoid self being a cross-contaminator.

The study showed overall level of knowledge was highest for third year and comparatively less in fourth year, fifth year and interns. This might be because of the curriculum that prioritized theory during third year of academic course. From fourth years till internship students more dedicated to clinical postings and acquiring basic dentistry skills. Moreover, chronic oral ulcer is mostly suspected for oral cancer, often handled by residents or faculties thereby limiting the exposure to undergraduates.

The study is novel as it addresses one of the common oral complain however, has limitations with cross-sectional design and convenience sampling technique-based result. The other limitation of the study is paucity of similar study to compare the result obtained. Future study should aim to explore on multi-institutions-based studies, address to other common complains like swelling and the application of learned-centered studies.

CONCLUSION

The study showed almost half of the students had good and above level of knowledge and half following standard practice in diagnosing chronic oral ulcer. Chronic oral ulcer should be carefully evaluated to rule out oral cancer while considering other differential diagnosis. The level of knowledge and concordance between knowledge and practice among undergraduates can be improved through reforming the traditional mode of education system to learner-center educational approach. Moreover, our undergraduate's ability should always be motivated by providing an opportunity to handle, diagnose and manage the case under the supervision such that a fare practice can be established both for patients and for students.

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