Awareness of oral cancer among medical students in Chennai

Ambika Murugesan¹, Sabarinath², Sivapathasundharam²

¹Department of Oral Pathology, Ragas Dental College & Hospital, Uthandi, Chennai, Tamil Nadu, India, ²Department of Oral Pathology & Microbiology, Meenakshi Ammal Dental College & Hospital, Chennai, Tamil Nadu, India

Abstract

Background: Most common cause of death in developed and developing countries is oral cancer, with increasing habits of smoking, tobacco chewing, and alcohol consumption. Early diagnosis required for better cure rates and improves the quality of life. Screening of oral cancer in general hospitals provides a “window of opportunity” for early diagnosis.

Aim: To assess the knowledge of oral cancer and the screening practice among medical students in Chennai city.

Objective: To investigate whether medical students are aware of the risk factors and clinical signs of oral cancer.

Methodology: A total of 500 medical students (365 undergraduate and 165 postgraduate) studying in Chennai city were included in the questionnaire based survey.

Results: About 50% of medical students are aware of oral cancer and only 37% of students screen patients for oral signs during examination; 65.8% of students accept tobacco to be the main etiology of cancer; 31.2% of students accept buccal mucosa to be the common site, and 83% of students are willing to participate in oral cancer screening program.

Conclusion: The prognosis of patients depends on the stage of the disease at the time of diagnosis.

Keywords
Early diagnosis, oral cancer, prognosis

Introduction

Cancer occurs with more than 10 million new cases and 6 million deaths every year worldwide affecting the morbidity and mortality rates. Oral cancer ranking sixth with more than 300,000 new cases diagnosed each year. The term “oral cancer” is used to describe any malignancy that arises from the oral cavity comprising of lip, tongue, buccal mucosa, and oropharynx. In India, the prevalence of cancer is estimated around 2.5 million, with over 800,000 new cases and 550,000 deaths each year.

Oral cancer affects individual in the 6th and 7th decades of life with the history of smoking, tobacco chewing, and alcohol consumption. A diet deficient in fruit and vegetables also predisposes toward the development of oral cancers. Other risk factors include oncogenic virus, Candida, iron deficiency, radiation, immunosuppression, carcinogens, tumor-suppressor genes, ultraviolet rays, trauma, and ill-fitting dentures. Oral cancer usually arises as a non-healing painless ulcer in the normal mucosa or an area of clinically altered oral mucosa such as leukoplakia or erythroplakia.

Early diagnosis and referral are essential for less treatment, which improves the prognosis and quality of life. Most patients with oral symptoms that are suspicious of oral cancer consult their medical practitioners first. In such situations, the knowledge of risk factors and the importance of early diagnosis of oral cancer are comparatively less among the undergraduate (UG) medical professionals. In comparison, oral cancer awareness by dental students is well documented.

Hence, in this study, the aim is to investigate, whether medical students are aware of clinical presentations of oral cancer, and to assess their contribution for early detection and screening of oral cancer.

Methodology

A total of 500 medical students studying in Chennai city were included in this survey. Among them, 365 were UG medical students, and 135 were postgraduate (PG) medical students. Medical students were approached directly and asked to
complete the questionnaire related to oral cancer awareness and are assessed in the presence of the surveyor.

The questionnaire prepared is used to assess the oral examination habits, etiology, and clinical appearance of oral cancer. The results were assessed using "independent samples t-test" and "Levene’s test for equality of variance."

**Results**

Among the 500 medical students, 73% \((n = 365)\) are UG students and 27% \((n = 135)\) were PG students. The awareness of oral cancer is comparatively high among the PG students than the UG students, but the mean difference is very marginal (negligible) \([\text{Graph 1}]\).

About 65.8% of students identified tobacco as the main etiology of cancer but very few identified alcohol, old age, ill-fitting denture, sun exposure, and as other etiologies \([\text{Graph 2}]\). Only 31.2% of students were aware that buccal mucosa is the common site of oral cancer \([\text{Graph 3}]\). 52% of students identified the presence of a white patch is related to tobacco use. Only 14.8% of students identified that ventro-lateral surface is the common area to develop cancer in the tongue. 46.8% of students identified that floor of the mouth has increased frequency for malignancy while only 26.4% identified tongue has increased frequency.

About 66% of students were aware of the feature of the metastasized lymph node as hard, fixed, and painless, but only 55% of students have referred patients to the dental surgeon on suspicion of oral cancer. The majority of the students (93%) were aware that a non-healing ulcer in the oral cavity is suspicious of cancer; 90% of the students were aware of the importance of examination of patient’s oral cavity on admission, but only 37% screen in patients for any signs of oral cancer. 83% of students were willing to participate in oral cancer screening programs.

Table 1 shows a statistical difference between the UG and PG medical students using independent samples \(t\)-test, and the inference is tabulated in Table 2.

**Discussion**

Oral cancer has one of the highest mortality ratios among all malignancies and is the most common cancer in India accounting for 50-70% of total cancer mortality.\(^{[13]}\) In India, the incidence of oral cancer is reported as 12.6/100,000 populations. Ranking 1\(^{st}\) among all cancer in males and 3\(^{rd}\) most common in females.\(^{[14]}\)

General medical practitioners are occasionally the dental care source in rural areas which shows their key role in the health care system. Patients often consult their family physician rather than their dentist regarding oral lesions. In this present survey, chronic use of tobacco products is the commonly identified risk factor, and this finding was consistent with the reports from Chicago,\(^{[15]}\) the United Kingdom\(^{[16]}\) and a study on assessment of oral cancer prevention curriculum among US medical schools.\(^{[16]}\) Furthermore, the buccal mucosa is identified as the common site of oral cancer, and this was consistent with a report from Indian Council of Medical Research.\(^{[17]}\)

Oral changes following tobacco products were less identified by the students as only 48% identified white lesions in the oral cavity are associated with tobacco products. Leukoplakia is one of the common white lesions associated with tobacco use. Malignant transformation of leukoplakia 8.9-17.5% worldwide and 0.3-0.6% in India.\(^{[8]}\)
### Table 1: Statistical difference between UG and PG medical students using independent sample t-test

| Q.No | Levene’s test for equality of variances | t-test for equality of means | 95% confidence interval of the difference |
|------|---------------------------------------|-----------------------------|-----------------------------------------|
|      | F     | Sig.  | t     | df  | Sig. (2-tailed) | Mean difference | Standard error difference | Lower     | Upper     |
| Q1   | 0.372 | 0.542 | −0.100 | 498 | 0.921 | −0.005 | 0.051 | −0.105 | 0.095 |
| Q2   | 20.480 | 0.000 | −2.157 | 498 | 0.031 | −0.055 | 0.026 | −0.106 | −0.005 |
| Q3   | 6.841 | 0.009 | −2.673 | 390.884 | 0.008 | −0.055 | 0.021 | −0.096 | −0.015 |
| Q5   | 19.410 | 0.000 | −2.096 | 498 | 0.037 | −0.060 | 0.028 | −0.116 | −0.004 |
| Q6   | 47.758 | 0.000 | 3.587 | 498 | 0.000 | 0.117 | 0.033 | 0.053 | 0.181 |
| Q7   | 2.660 | 0.104 | 3.070 | 185.582 | 0.002 | 0.117 | 0.038 | 0.042 | 0.192 |
| Q8   | 0.133 | 0.716 | 0.938 | 498 | 0.349 | 0.047 | 0.050 | −0.052 | 0.146 |
| Q11  | 10.942 | 0.001 | −1.493 | 498 | 0.136 | −0.061 | 0.041 | −0.141 | 0.019 |
| Q14  | 6.495 | 0.011 | −3.569 | 498 | 0.000 | −0.176 | 0.049 | −0.272 | −0.079 |
| Q15  | 1.511 | 0.220 | 0.608 | 228.075 | 0.544 | 0.024 | 0.039 | −0.053 | 0.100 |

UG: Undergraduate, PG: Postgraduate

### Table 2: Statistical analysis inference

| Q.No | Students | N   | Mean (standard deviation) | Standard error mean | Inference |
|------|----------|-----|---------------------------|---------------------|-----------|
| Q1   | UG students | 365 | 0.499 (0.506) | 0.026 | Awareness of oral cancer is somewhat equal among the two groups of UG and PG students |
|      | PG students | 135 | 0.502 (0.043) | | |
| Q2   | UG students | 365 | 0.92 (0.279) | 0.015 | PG students feel it important to examine a patient's oral cavity on admission than the UG students |
|      | PG students | 135 | 0.97 (0.170) | 0.015 | |
| Q3   | UG students | 365 | 0.39 (0.489) | 0.026 | UG level general physicians screen patients for oral cancer (more than) the PG students |
|      | PG students | 135 | 0.33 (0.473) | 0.041 | |
| Q5   | UG students | 365 | 0.90 (0.306) | 0.016 | PG students feel that presence of non-healing ulcer is suspicious of oral cancer lesion |
|      | PG students | 135 | 0.96 (0.207) | 0.018 | |
| Q6   | UG students | 365 | 0.91 (0.287) | 0.015 | Majority of UG students feel that tobacco use and volume of alcohol consumed per day is related to oral cancer |
|      | PG students | 135 | 0.79 (0.407) | 0.035 | |
| Q7   | UG students | 365 | 0.57 (0.496) | 0.026 | UG students feel that antral carcinoma is related to oral cavity than when compared to PG students |
|      | PG students | 135 | 0.50 (0.502) | 0.043 | |
| Q9   | UG students | 365 | 0.53 (0.500) | 0.026 | UG students feel the presence of white patches in oral cavity related to tobacco use |
|      | PG students | 135 | 0.48 (0.502) | 0.043 | |

(Contd...)
Painless mass or a non-healing ulcer is the common sign of cancer. In tongue, the lesion develops on the lateral border or ventral surface of the tongue followed by the base of the tongue and rarely on the dorsal aspect of the tongue. Lesions on tongue show early metastases and poor prognosis and high incidence of cervical metastases compared to floor of the mouth.\[6,18,19\] In the present survey, 50.2% medical students identified the base of the tongue is the common site of cancer and 46.8% identified floor of the mouth has increased the frequency of metastases.

Early diagnosis and referral are essential in treating oral cancer, as 50% of new cases at their first visit to medical centers present with advanced stages of the lesion. It is, therefore, accepted that prevention and screening of oral cancer are important. Hence, it is not only the dentist but also other medical professionals or specialists and public first-line health care institutes must be included in the screening program.\[20\] In the present survey, only 37% of students screen the oral cavity during routine examination of patients.

In the previous studies conducted in Chicago,\[15\] the United Kingdom,\[18,21\] and the United States,\[16\] oral cancer awareness among the medical students is not adequate, whereas satisfactory knowledge of awareness found among the medical students in Dakshina Kannada, India.\[22\] In the present study, the results confirmed that the medical students in Chennai have adequate knowledge of oral cancer, but their contribution for screening and detecting oral cancer needs a scope for improvement.

**Conclusion**

Even though oral examination has been included in the curriculum of the medical profession, the students must be motivated to know about oral cancer etiology and its clinical presentation through mass media and education programs as 83% of students are willing to participate in screening programs for oral cancer. This can have a tremendous implication on screening population and detection of any malignancy in the oral cavity at earlier stage. It is well known that the prognosis of patients with cancer largely depends on the stage of the disease at the time of diagnosis.

**Table 2: (Continued)**

| Q.No | Group statistics | N  | Mean | Standard deviation | Standard error mean |
|------|------------------|----|------|--------------------|---------------------|
| Q11  | UG students      | 365| 0.78 | 0.419              | 0.022               |
|      | PG students      | 135| 0.84 | 0.364              | 0.031               |
| Q14  | UG students      | 365| 0.37 | 0.484              | 0.025               |
|      | PG students      | 135| 0.55 | 0.500              | 0.043               |
| Q15  | UG students      | 365| 0.84 | 0.369              | 0.019               |
|      | PG students      | 135| 0.81 | 0.390              | 0.034               |

UG: Undergraduate, PG: Postgraduate

**Inference**

- PG students feel that oral cancer can be metastasized to other parts of the body
- Majority of PG students have advised the patients to go to a dentist or a surgeon for suspicious oral cancer lesion
- Majority of UG students are willing to participate in a network to promote early screening for oral cancer

**References**

1. Petersen PE. Oral cancer prevention and control – The approach of the World Health Organization. Oral Onkol 2009;45:454-60.
2. Choi S, Myers JN. Molecular pathogenesis of oral squamous cell carcinoma: Implications for therapy. J Dent Res 2008;87:14-32.
3. Nandakumar A, National Cancer Registry Programme.Indian Council of Medical Research, Consolidated Report of the Population Based Cancer Registries. New Delhi, India: NCRP; 1990-1996.
4. Scully C, Bagan J. Oral squamous cell carcinoma overview. Oral Oncol 2009;45:301-8.
5. Pavia M, Pileggi C, Nobile CG, Angelillo IF. Association between fruit and vegetable consumption and oral cancer: A meta-analysis of observational studies. Am J Clin Nutr 2006;83:1126-34.
6. Chaiyachati K, Cinti SK, Kauffman CA, Riddell J. HIV-infected patients with anal carcinoma who subsequently developed oral squamous cell carcinoma: Report of 2 cases. J Int Assoc Phys AIDS Care (Chic) 2008;7:306-10.
7. Sherin N, Simi T, Shameena P, Sudha S. Changing trends in oral cancer. Indian J Cancer 2008;45:93-6.
8. Rajendran R, Sivapathasundaram B. Benign and malignant tumors of oral cavity. Shaefer’s Text Book of Oral Pathology. 6th ed. St. Louis: Elsevier Publication; 2009. p. 359-65.
9. Paleri V, Staines K, Sloan P, Douglas A, Wilson J. Evaluation of oral ulceration in primary care. BMJ 2010;340:c2639.
10. Carter LM, Harris AT, Kavi VP, Johnson S, Kanatas A. Oral cancer awareness amongst hospital nursing staff: A pilot study. BMC Oral Health 2009;9:4.
11. Carter LM, Ogden GR. Oral cancer awareness of undergraduate medical and dental students. BMC Med Educ 2007;7:44.
12. Carter LM, Ogden GR. Oral cancer awareness of general medical and general dental practitioners. Br Dent J 2007;203:E10.
13. Khedkar SP, Bagdey PS, Tiwari RR. Oral cancer and some epidemiological factors: A hospital based study. Indian J Community Med 2006;31:157-9.
14. Swaminathan R, Shanta V, Ferlay J, Balasubramanian S, Bray F, Sankaranarayanan R. Trends in cancer incidence in Chennai city (1982-2006) and statewide predictions of future burden in Tamil Nadu (2007-16). Natl Med J India 2011;24:72-7.
15. Mobyuddin N, Langerman A, LeHew C, Kaste L, Pytynia K. Knowledge of head and neck cancer among medical students.
at 2 Chicago Universities. Arch Otolaryngol Head Neck Surg 2008;134:1294-8.
16. Ahluwalia KP, Yellowitz JA, Goodman HS, Horowitz AM. An assessment of oral cancer prevention curricula in U.S. medical schools. J Cancer Educ 1998;13:90-5.
17. Indian Council of Medical Research. Guidelines for Management of Buccal Mucosa Cancer. New Delhi: Indian Council of Medical Research; 2010.
18. Nithya C, Pandey M, Naik B, Ahamed IM. Patterns of cervical metastasis from carcinoma of the oral tongue. World J Surg Oncol 2003;1:10.
19. Macfee WF. Carcinoma of the floor of the mouth: Clinical observations and surgical treatment. Ann Surg 1959;149:172-87.
20. Kao SY, Chu YW, Chen YW, Chang KW, Liu TY. Detection and screening of oral cancer and pre-cancerous lesions. J Chin Med Assoc 2009;72:227-33.
21. Carter LM, Parsonage-Grant S, Marshall A, Achal KS, Kanatas A. Oral cancer teaching of medical students in the UK: Time for a new approach? J Cancer Educ 2011;26:308-14.
22. Shenoy N, Ahmed J, Saranya B, Shenoy A, Kamath P, Srikanth N, et al. Oral cancer awareness among undergraduate medical students of Dakshina Kannada, India. Sch J Appl Med Sci 2013;1:632-6.

**Annexure**

“**Awareness of oral cancer among medical students in Chennai**”

(This is an anonymous survey. Information provided will be kept confidential.)

1) Do you carry out an oral health checkup on a patient’s admission?
   (a) Yes   (b) No

2) Do you think is it important to examine a patient’s oral cavity on admission?
   (a) Yes   (b) No

3) Do you screen patients for signs of oral cancer during a physical examination?
   (a) Yes   (b) No

4) Main etiology of oral cancer is
   (a) Chronic use of tobacco products   (d) Ill-fitting denture
   (b) Chronic alcohol use   (e) Sun exposure
   (c) Old age   (f) All of the above

5) Do you feel that presence of non-healing ulcers is suspicious of oral cancer lesion?
   (a) Yes   (b) No

6) Is tobacco use and volume of alcohol consumed per day is related to oral cancer?
   (a) Yes   (b) No

7) Do you feel antral carcinoma by any chance related to oral cavity?
   (a) Yes   (b) No

8) Which area of oral cavity is most likely to develop oral cancer?
   (a) Buccal mucosa   (b) Gingiva
   (c) Palate   (d) Floor of the mouth
   (e) Tongue

9) Do you feel presence of whitish patches in oral cavity is related to tobacco use?
   (a) Yes   (b) No

10) Which area of the tongue is most likely to develop oral cancer?
     (a) Dorsal surface   (d) Base of the tongue
     (b) Ventro-lateral border   (e) All areas of tongue

11) Can oral cancer be metastasized to other parts of the body?
     (a) Yes   (b) No

12) Which part of the oral cavity has increased frequency for metastases?
     (a) Lip   (b) Tongue
     (c) Floor of mouth   (d) Gingiva

13) Which of the following is the feature of metastasized lymph node in neck?
     (a) Hard, painful, mobile   (b) Soft, painless, fixed
     (c) Hard, painless, fixed   (d) Soft, painful, mobile

14) In the past 6 months have you advised patients to go to a dentist or a surgeon for suspicious oral cancer lesion?
     (a) Yes   (b) No

15) Would you be willing to participate in a network to promote early screening for oral cancer?
     (a) Yes   (b) No

**How to cite this article:** Murugesan A, Sabarinath, Sivapathasundharam. Awareness of oral cancer among medical students in Chennai. J Med Radiol Pathol Surg 2016;2:18-22.