

Human oral squamous cell carcinoma (OSCC) in Odisha: A hospital-based study

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ABSTRACT

Oral squamous cell carcinoma (OSCC) is one of the top ten diseases world-wide and a major cause of death in India. In the present study it is found that OSCC is a serious health hazard which is increasing day by day in Odisha. The prevalence of maximum number of patients in Stage-III (42.7 % in male and 50.0% in female) as well as in the age group of 50-69 years (41.5% in male and 66.6% in female) were of great significance to public health. Carcinoma of buccal (cheek) mucosa was observed to be more (45.2% in male and 48.2% in female) than other sites of the buccal cavity is probably due to the habit of keeping smokeless tobacco (oral snuff and khaini), chewing of paan or betel quid, paan masala and gutkha for longer time. In addition to that smoking of bidi and cigarettes as well as drinking of alcohol were found to be strongly carcinogenic among the people of Odisha. This problem needs to be addressed immediately by banning of tobacco, tobacco products and alcohol. Also, incidence of oral carcinoma in non-addicted individuals needs special attention and further research.

Key words: Oral squamous cell carcinoma, Scrape smear, Cellular differentiation, Grading and Staging.

INTRODUCTION

Cancer is one of the serious health hazards in the world. Of all categories of cancers, oral cancer is one of the top ten cancers world-wide, with broad differences in geographic variation. According to the World Health Organization (WHO), carcinoma of oral cavity in males in developing countries is the sixth most common cancer after lungs, prostate, colo-rectum, stomach and bladder cancer, while in females, it is the tenth commonest site of cancer after breast, colo-rectum, lungs, stomach, uterus, cervix, ovary, bladder and liver [1,2]. Each year, 5,75,000 new cases and 3,20,000 deaths occur worldwide [3]. Oral cancer in biomedical term is known as oral squamous cell carcinoma (OSCC) which comprises of 95 per cent of all oral cancers and these represent approximately 5 per cent of cancers in men and 2 per cent in women [4,5]. Annually, almost 7 per cent of all cancer deaths in males and 4 per cent in females have been reported due to oral cancer worldwide. India, in particular shows a greater percentage of oral cancer because of various types addictions such as tobacco chewing, tobacco smoking and alcohol drinking [5,6,7,8,9,10,11]. Tobacco is chewed with the ingredients such as paan masala, gutkha, khaini and snuff. It is smoked mostly in the form of bidi (a native cigarette of coarse tobacco hand rolled in a dry tembhurni leaf) and cigarette [12, 13].

The present investigation aims at the study of potentialities of oral squamous cell carcinoma (OSCC) with special reference to age, sex, oral sites and addiction of the patients in Odisha.

MATERIALS AND METHODS

Samples in the form of scrape were collected during May 2007 to May 2009 from the affected sites of the clinically diagnosed 136 oral cancer patients, who have registered at the Out-patient Department (OPD) of Acharya Harihar Regional Cancer Center, Cuttack, Odisha-the only government hospital for the treatment of cancer patient. Two smearing slides were prepared from each affected site. The collected tissues in the form of smears on the slides were immediately fixed in acetoalcohol (1:3). Prior to the collection, the case history of the patients were collected through prepared questionnaire form. The wet fixed smears were stained by routine Papanicolaou's staining protocol [14] and Giemsa's solution [15]. Photomicrograph of the tissues and photographs of the patients were taken out as supporting evidence. The findings were statistically analyzed, interpreted and correlated with age, sex and addiction of the patients.

RESULTS

The results of the present investigation are described as below.

3.1 Age and Sex

Out of 136 hospital reported oral cancer cases, 82 (60.3 per cent) were males and 54 (39.7 per cent) were females. Generally, the age and sex are two important factors in the development of cancer. The recorded age of 136 patients varies from 30-87 years. Therefore, the collected samples were categorized into three broad age-groups such as 30-49, 50-69, and 70-89 years (Table 1). Out of 82 males, 33 (40.28 per cent) patients belong to 30-49 years, 34 (41.5 per cent) were between 50-69 years and 15 (18.3 per cent) patients were under 70-89 years. Out of 54 females, 11 (20.4 per cent) were between 30-49 years, 36 (66.6 per cent) were grouped under 50-69 years and 07 (13.7 per cent) belong to 70-89 years of age group. The relative proportion of the patients was found to be more (41.5 per cent in males and 66.6 per cent in females) in the age group of 50-69 years than other two groups (Fig.1).

3.2 Oral sites

According to International Classification of Diseases and Related Health Problems, 10th Revision (ICD-10), the common sites of the oral cavity, such as lips (C00), tongue (dorsal C01, ventral-C02), alveolus and gingiva (C03), floor of the mouth (C04), palate (C05) and buccal (cheek) mucosa (C06) are usually taken into account for a gross study, so far as oral cancer is concerned. On the basis of ICD-10, out of 136 cancerous samples, 05 (6.1 per cent) males and 06 (11.1 per cent) females were reported to have lip cancer, 11 (13.4 per cent) males and 07 (12.9 per cent) females were sufferer of tongue carcinoma, 16 (19.5 per cent) males and 06 (11.1 per cent) females were of cancer at alveolus and gingiva, 07 (8.5 per cent) males and 06 (11.1 per cent) females were cancerous at floor of the mouth, 06 (7.3 per cent) males and 03 (5.6 per cent) females were of palatal cancer, and 37 (45.2 per cent) males and 26 (48.2 per cent) females were suffering from cancer at buccal mucosa (Table 2, Figs.2 and 3.i- 3.vi).

3.3 Addiction

Considering the nature of addiction, out of 136 cancer affected individuals, 126 (92.6 per cent) were addicted to different forms of tobacco and alcohol for more than 15 years and 10 (7.4 per cent) were non-addicted. From 126 addicted individuals, 76 (60.3 per cent) were males and 50 (39.7 per cent) were females. Similarly, out of 10 non-addicted individuals, 06 (60.0 per cent) were males and 04 (40.0 per cent) were females. In the addicted groups, 23 (27.9 per cent) males and 20 (37.0 per cent) females were chewers, 09 (10.9 per cent) males and 02 (3.7 per cent) females were smokers and 12 (14.6 per cent) males and 18 (33.3 per cent) females were alcoholics (Fig.4).

Furthermore, 24 (29.4 per cent) males and 04 (7.4 per cent) females were addicted to both chewing and smoking of tobacco and 08 (9.8 per cent) males and 06 (11.2 per cent) females were habituated to chewing and smoking of tobacco and drinking of alcohol.

Table 1 Age group and sex-wise oral cancer patients

No	Age groups in years	Male (%)	Female (%)	Total (%)
1	30-49	33(40.21)	11(20.4)	44(32.4)
2	50-69	34(41.5)	36(66.6)	70(71.5)
3	70-89	15(18.3)	07(13.7)	22(16.1)
Total	30-89	82(60.3)	54(39.7)	136(100)

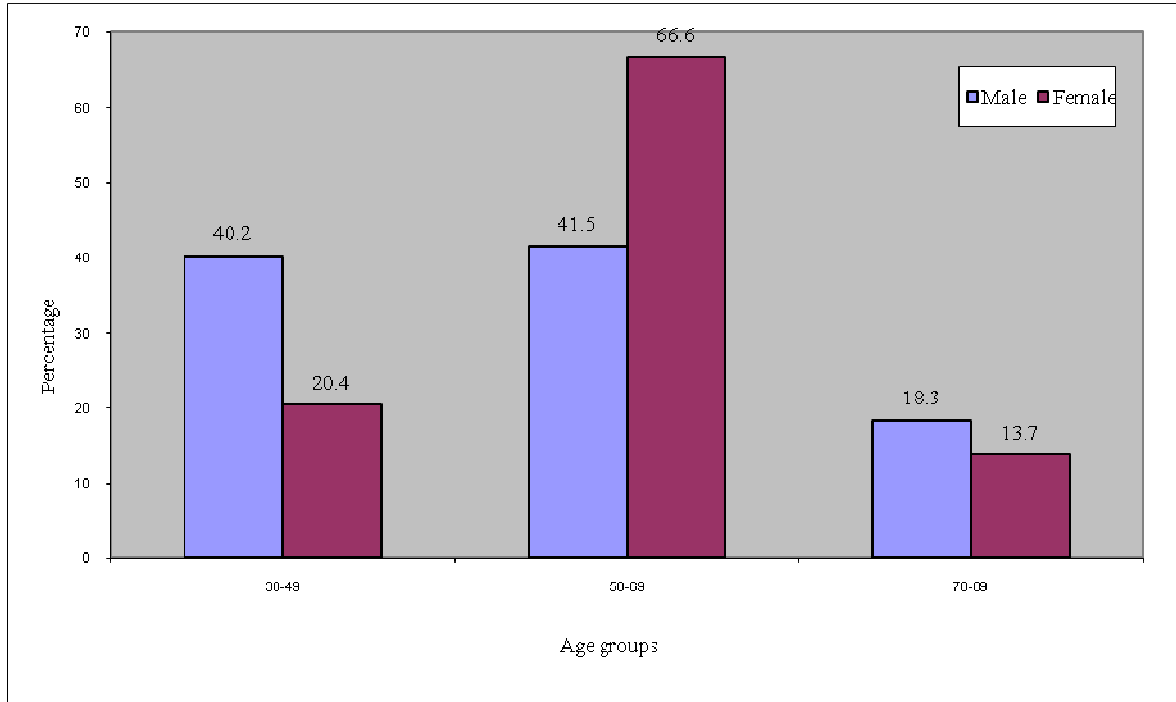


Fig. 1 Sex-wise relative proportion of patients in different age groups

Table 2 Site and sex-wise collected samples

No	Oral sites(ICD-10)	Cancer affected group		
		Male (%)	Female (%)	Total (%)
1	Lip (C00)	05 (6.1)	06 (11.1)	11 (8.0)
2	Tongue (C01-02)	11 (13.4)	07 (12.9)	18 (13.2)
3	Alveolus and gingival (C03)	16 (19.5)	06 (11.1)	22 (16.2)
4	Floor of the mouth (C04)	07 (8.5)	06 (11.1)	13 (9.6)
5	Palate (C05)	06 (7.3)	03 (5.6)	09 (6.7)
6	Buccal mucosa (C06)	37 (45.2)	26 (48.2)	63 (46.3)
All sites		82	54	136

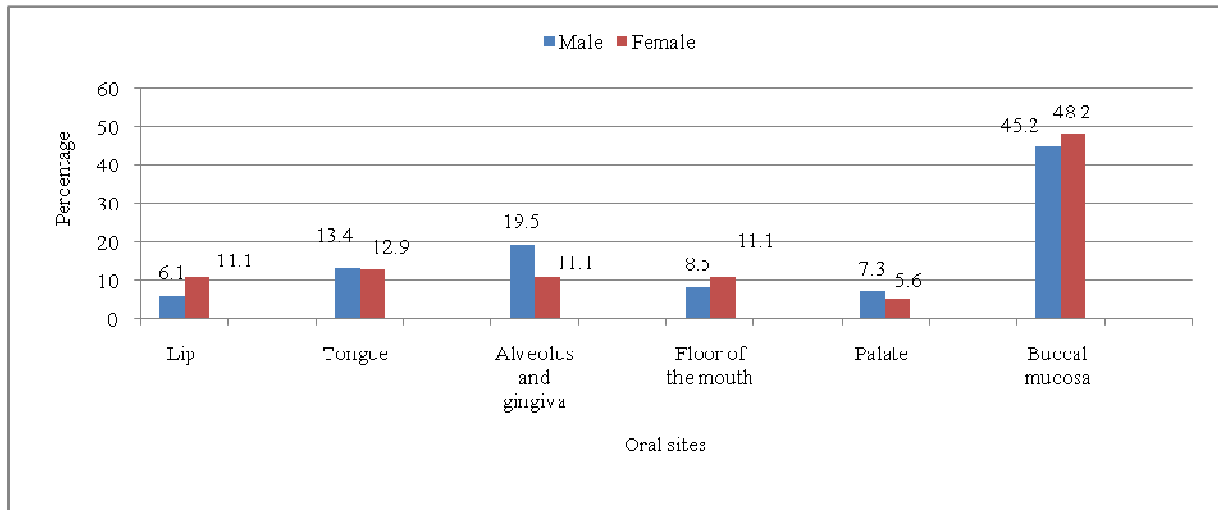


Fig.2 Oral site and Sex-wise relative proportion of patients

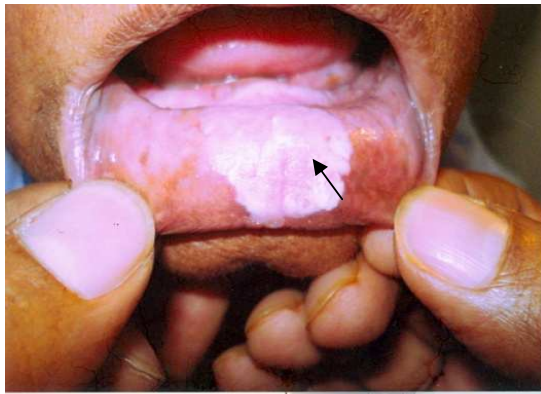


Fig.3.i.Carcinoma of lip



Fig.3. ii.Carcinoma of tongue



Fig.3.iii.Carcinoma of alveolus and gingiva



Fig.3.iv.Carcinoma of floor of the mouth



Fig.3.v.Carcinoma of palate



Fig.3.vi.Carcinoma of buccal mucosa

Fig.3.i-vi Site-specific oral squamous cell carcinoma

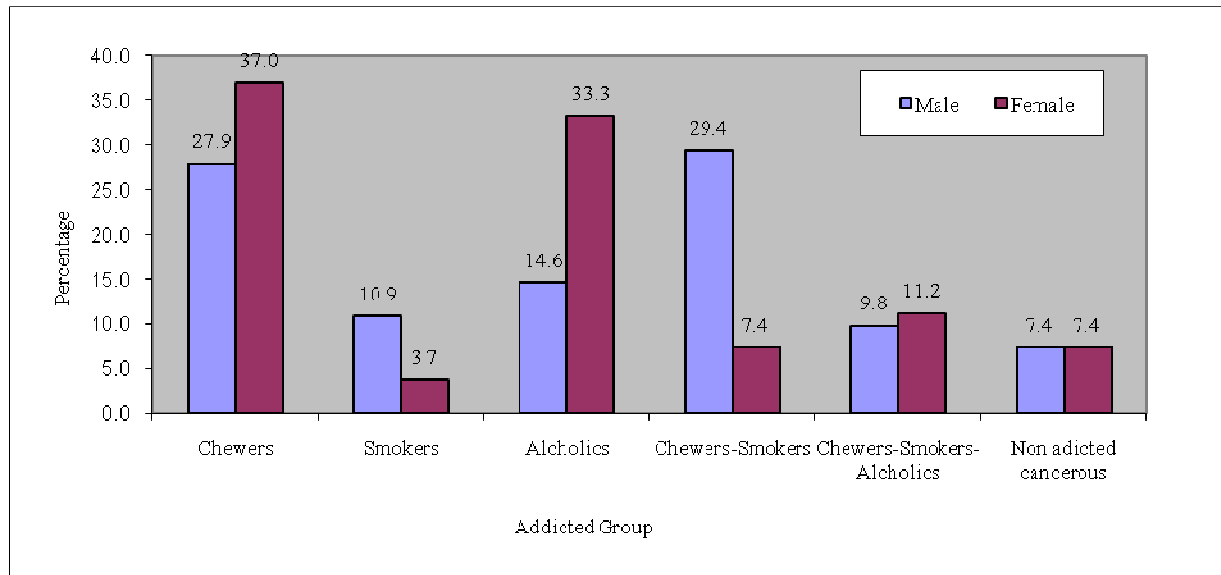


Fig.4 Relative percentage of addicted and non-addicted cancerous individuals

In addicted group, the patients were addicted to chewing of tobacco in the form of oral snuff (hydrated paste form of tobacco leaf and lime), khaini (processed tobacco), gutkha, paan masala, betel quids etc; smoking of bidi (made of processed coarse tobacco leaf hand rolled in a piece of tembhurni leaf) and cigarettes and also to drinking of alcohol. All these products are plentifully available in the betel shops, grocery shops and even in and around the educational institutions of Odisha. The frequency of addiction also differs from individual to individual according to their habit. However, their duration of their addiction ranges from 15-45 years.

3.4 GRADING AND STAGING OF THE OSCC PATIENTS

On the basis of cellular differentiation and Broder’s grading [16] out of 136 control samples 82 (100 per cent) males and 54 (100 per cent) females were found to have well differentiated squamous cells (WDSC). But, in cancer affected groups, out of 82 males and 54 females, 42 (51.2 per cent) males and 30 (55.6 per cent) females were of WDSC (Grade-I), 25 (30.5 per cent) males and 12 (22.2 per cent) females were having MDSC (Grade-II) and 15 (18.3 per cent) males and 12 (22.2 per cent) females were of PDSC (Grade-III) (Table 3 and Figs.5.i-5.iii).

According to the TNM system for staging of oral squamous cell carcinoma, T- refers to the extent of primary tumor, N- to the regional lymph nodes and M- to the presence or absence of distance metastasis [17]. With reference to the TNM- system for staging of OSCC, it was found that 11 (13.4 per cent) males and 06(11.1 per cent) females were grouped under stage-I, 14 (17.1 per cent) males and 12 (22.2 per cent) females belong to stage-II, 35 (42.7 per cent) males and 27(50.0 per cent) females come under stage-III and 22 (26.8 per cent) males and 09 (16.7 per cent) females were included in stage-IV, respectively (Table 4 and Fig.6).

Table 3 Enumeration of oral cancer patients according to Broders' grading

No	Grade	Cancerous group		
		Male(%)	Female(%)	Total(%)
1	WDSC-I	42 (51.2)	30 (55.6)	72 (52.9)
2	MDSC-II	25 (30.5)	12 (22.2)	37 (27.2)
3	PDSC-III	15 (18.3)	12 (22.2)	27 (19.9)
Total		82	54	136

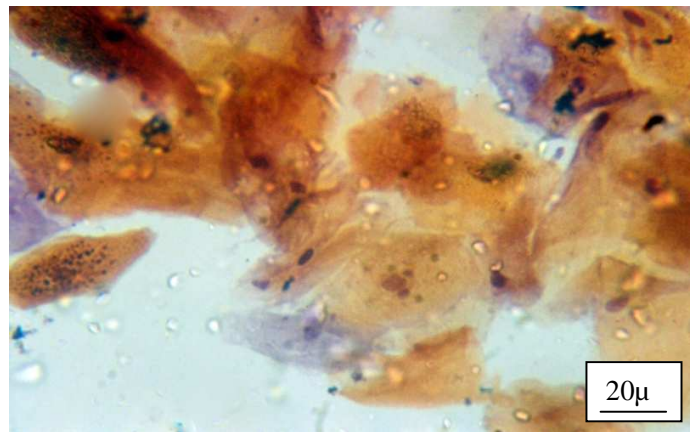


Fig.5.i Well differentiated oral squamous cells(Papanicolau's stain x400)

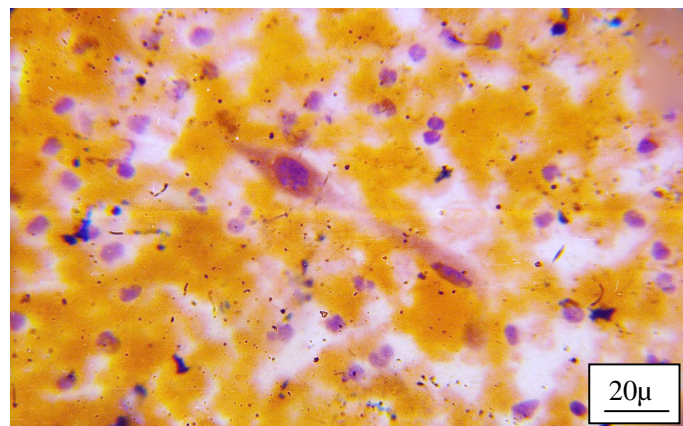


Fig.5.ii Moderately differentiated oral squamous cells (Papanicolau's stain x400)

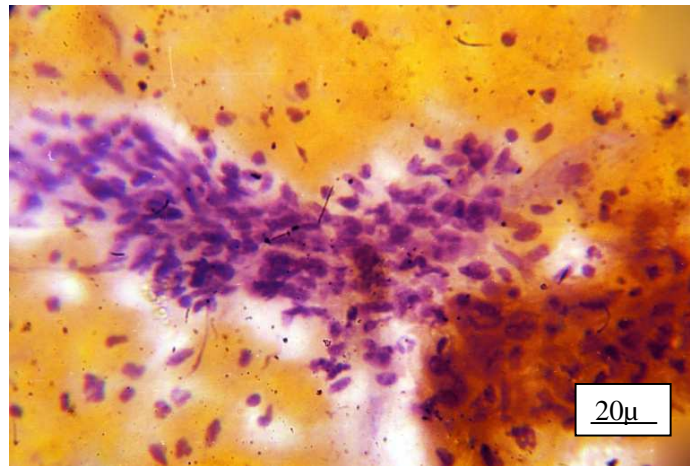


Fig.5.iii Poorly differentiated oral squamous cells(Papanicolau's stain x400)

Table 4 Staging of OSCC patients according to the TNM system of classification

No	Stage	Male	Female	Total
1	I	11 (13.4)	06 (11.1)	17 (12.5)
2	II	14 (17.1)	12 (22.2)	26 (19.1)
3	III	35 (42.7)	27 (50.0)	62 (45.6)
4	IV	22 (26.8)	09 (16.7)	31 (22.8)
Total		82	54	126

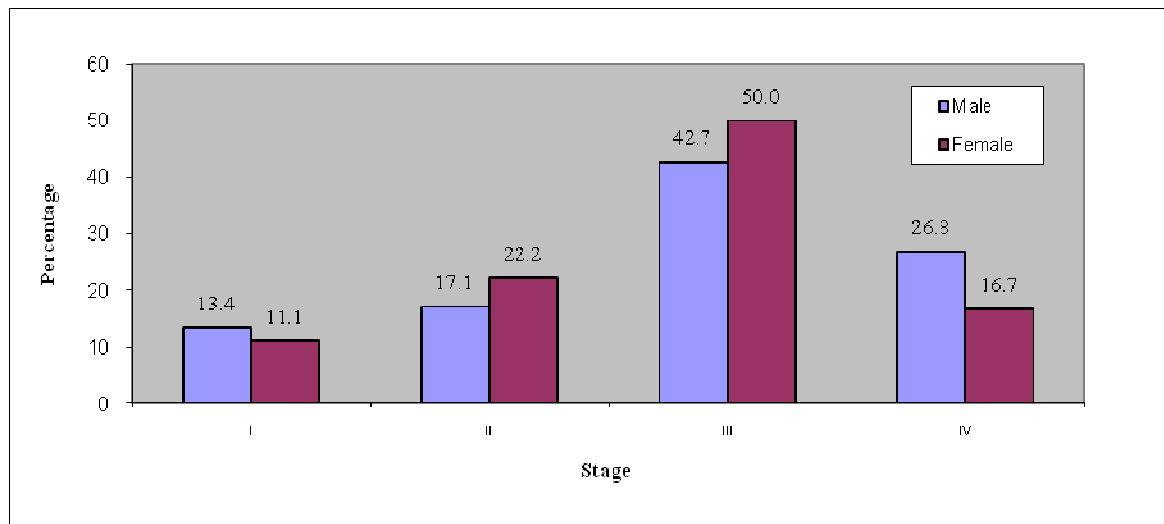


Fig.6 Stage-wise relative percentage of oral cancer patients

DISCUSSION

The consolidated report of the hospital based cancer registry (HBCR) of India: 2001-2003 indicates that the relative proportion of oral cancer with respect to all sites in five registries were found to be 63.6 per cent in males and 36.4 per cent in females in Bangalore, 63.3 per cent in males and 36.3 per cent in females in Chennai, 69.05 per cent in males and 30.95 per cent in females in Dibrugarh, 75.8 per cent in males and 24.2 per cent in females in Mumbai

and 49.4 per cent in males and 50.6 per cent in females in Thiruvananthapuram [18]. In this present investigation, the relative proportions of male and female patients were calculated to be 60.3 and 39.7 per cent respectively, in Odisha.

With reference to the age and sex, majority (53.5 per cent) of the patients belong to the age group 50-69 years, which supports the findings of earlier studies [6,13,19,20,21]. It has also been reported that the cancer of the lip and tongue accounts for 25-40 per cent each, while gingiva, floor of the mouth palate and buccal mucosa hold 10-20 per cent each as cancer-prone sites [4, 22]. In this present study, 45.2 to 48.2 per cent cancer of buccal mucosa followed by gingiva, tongue, lip, floor of the mouth and palate which accounts for 5.6 to 19.5 per cent are recorded.

The chronic use of smokeless tobacco (in the form of khaini and snuff), chewing of betel quid, paan masala and gutkha have been reported to be carcinogenic [13,21,23,24,25,26,27]. Smoking [7,12,30] and drinking of alcohol [8,10,11,13,20] synergistically affect the oral mucosa. Habitual use of khaini and oral snuff; chewing of betel-quid, paan masala and gutkha; smoking of bidi and cigarettes and drinking of alcohol for more than 15 years, as reported in this study have been observed to be the primary cause of oral squamous cell carcinoma (OSCC) among the people of Odisha. Furthermore, the OSCC patients in stage III and in the age group of 50-69 year were observed to be more than other two groups respectively, in this study. This is probably due to the long latency period [26], body immunity, ignorance, carelessness or financial problem of the patients to treat at an early stage.

CONCLUSION

Within the limitation of sample size, the results indicate that oral squamous cell carcinoma (OSCC) in Odisha has no less importance in comparison to that of various cancer registries adopted by the National Cancer Registry Programme (NCRP) of India. Chewing and smoking of tobacco as well as drinking of alcohol are, no doubt, the strong risk factors for oral carcinogenesis, but the habit of such addictions has been increasing day by day which may be either due to ignorance or modern life-style or friend circle among the people of Odisha. Further, the highest percentages of oral cancer patient were recorded in the age group of 50-69 years (41.5 per cent in males and 66.6 per cent in females). In fact, majority of them were in stage III (42.7 per cent males and 50.0 per cent females) and most of them were suffering from carcinoma of buccal mucosa (45.2 per cent males and 48.2 per cent females). This indicates the prevalence of OSCC in Odisha.

The prevalence of non-addicted cancerous individuals (7.4 per cent) needs special attention and detailed further investigation. Therefore, both hospital based cancer registry (HBCR) and population based cancer registry (PCBR) programmes are suggested to be adopted in Odisha under National Cancer Registry Programme (NCRP) by the Government of India. Moreover, the youth mass addicted to tobacco and its products need to be cautioned, since, the youths of our country are highly affected in OSCC. Not only that, the Government of India is also suggested to ban the production of various forms of tobacco in the industry as well as selling of the same in the market in general and in and around the educational institutions in particular as soon as possible. Because in one hand, these products are directly hazardous for health and on the other hand, the wrappers and sachets are non-ecofriendly.

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