

Factors influencing the oral mucositis in the patients undergoing radiotherapy for head and neck cancer-an institutional based study

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Abstract

Background: Tobacco use in various forms, heavy alcohol consumption and poor diet causes over 90% of head and neck cancers. Bidi smoking is the most popular form of tobacco consumption in 54% cases and is the most common etiology in Head and Neck Carcinomas. ICMR data suggests the male predilection and its increasing incidence in age groups more than 50 year. Definitive radiotherapy is the mainstay of the treatment and oral mucositis is the most common complication. Various predisposing factors predict the mucositis incidence in head and neck cancer patients receiving treatment.

Material and Methods: The study was conducted 150 Head & neck cancer patients receiving radiation dose more than or equal to 56 gray, weekly concomitant chemoradiation in the form of Cis-platinum, Gemcitabine or Paclitaxel alternating with Gemcitabine. Results were compiled as mean \pm standard deviation or percentage.

Results: Smoking either as bidi or cigarette is the leading form of addiction, 78% (117/150), in the series. Alcohol consumption was noticed in 51.33% (77/150) of cases. Tobacco chewing (in any form) was also noticed in 46.67% (70/150). Opium addiction was recorded in 17.33% (26/150). Most of the patients presented with chief complaint of non-healing ulcer in the oral cavity along with the neck swelling (96 patients). Neck swelling was the one of the chief complaint in 89 patients of the series.

Conclusion: Severe mucositis was observed more in smokers, alcoholics, diabetics, opium addicts and patients having bad ODH. Most patients present with the primary in tongue either at base or lateral border, followed by alveolus/ buccal mucosa. Anemia was the most commonly observed associated pre-treatment factor, seen in more than half of the patients.

Keywords: Head and neck Cancer, Anemia, Diabetes, Smoking, Alcohol consumption

1. Introduction

In developing countries like ours, cancer of the head and neck is among one of the commonest cancers. They account for one fourth of male and one-tenth of female cancers in India. These are common in regions with high tobacco and alcohol consumption. Tobacco use in various forms, heavy alcohol consumption and poor diet causes over 90% of head and neck cancers. Bidi smoking is the most popular form of tobacco consumption in 54% cases and is the most common etiology in Head and Neck Carcinomas. ICMR data suggests the male predilection and its increasing incidence in age groups more than 50 year. A potential etiological role for Human Papilloma viruses cannot be excluded ^[1, 2]. Radiation and chemotherapy are effective activators of several injury producing pathways in endothelia, fibroblasts and epithelia. These signaling molecules participate in an inflammatory response with a positive-feedback loop that amplifies the original effects of radiation and chemotherapy ^[3]. Risk factors that impact the development, severity and duration of oral mucositis may be patient related and therapy-related. Patient-related risk factors include age, nutritional status, type of malignancy, pretreatment oral condition and oral care during treatment ^[4-6]. Understanding of mechanisms associated with oral complications continues to increase. Likewise, there are no universally effective agents or protocols to prevent toxicity.

The proper management of patients with mucositis is not confined to a single intervention but it includes multidimensional interventions or an integrated approach to care ^[7]. This study was undertaken to understand pre-treatment factors influencing the appearance and severity of mucositis,

2. Material and Methods

The prospective study was conducted among 150 Head & neck cancer patients receiving Radiation dose more than or equal to 56 gray, weekly concomitant chemoradiation in the form of Cis-platinum, Gemcitabine or Paclitaxel alternating with Gemcitabine. A signed informed consent was taken from the patients and ethical clearance was obtained before the commencement of the study. Patients with ECOG performance status 0-3, no distant metastases (M0) were included in the study. Patient receiving cytoreduction either in the form of neoadjuvant chemotherapy or surgery, thyroid Carcinoma Patients were excluded from the study. A proper detailed history of the disease, any history of addiction to smoking, alcohol, opium and tobacco consumption was taken. A complete physical examination with assessment of ECOG performance score, pre treatment oral assessment, primary tumor size and regional lymph nodes was carried out for all the patients in the study. Routine investigations like CBC, RFT, TSP, DSP, CXR-PA view, ECG were noted and ECHO was

done where required. For each group, master chart were made showing all the categories and continuous variables. Results were compiled as mean ± standard deviation or percentage.

3. Results

Table 1: Distribution of female patients according to the age

Age groups	Number of patients
< 30	1
31 – 40	5
41 – 50	9
51 – 60	11
61 – 70	11
>71	2

In the studied series, most female patients were in the age group 41-70 years (81.57%), the age group of 41-50 years has 23.68% females and 61.54% females were more than 50 years of age (table 1). Most of the male patients (69.64%) were in the age group 41-70 years. 71.17% males were more than 50 years of age (table 2). Only one female and two males were observed in age group less than 30 years.

Table 2: Distribution of male patients according to the age

Age	Number of patients
< 30	1
31 - 40	10
41 - 50	21
51 - 60	32
61 - 70	25
>71	22

Table 3: Incidence of presenting complaints in the studied series

Presenting complaints	No. of patients
Ulceration/nodule in oral cavity	96
Change in voice	14
Neck mass	89
Tonsillar enlargement	18
Difficulty/problem in swallowing	89
Facial disfigurement	12
Difficulty/problem in breathing	35
Decreased appetite	48
Decreased weight	31
Restriction of tongue movement	53

Most of the patients presented with chief complaint of non-healing ulcer in the oral cavity along with the neck swelling (96 patients). Neck swelling was the one of the chief complaint in 89 patients of the series. Facial disfigurement was complained by 12 patients, loss of the appetite was observed by 48 patients and 31 were having complaints of the weight loss. 89 patients presented with the complaint of the difficulty in swallowing. Restriction of the movement of tongue was seen in 53 patients (table 3).

In the present series, addiction was noted in most of the patients. Smoking either as bidi or cigarette is the leading form of addiction, 78% (117/150), in the series. Alcohol consumption was noticed in 51.33% (77/150) of cases. Tobacco chewing (in any form) was also noticed in 46.67% (70/150). Opium addiction was recorded in 17.33% (26/150) (Fig 1).

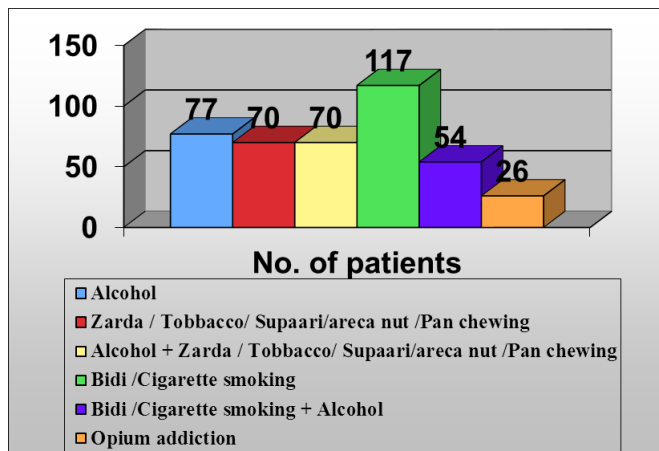


Fig 1: Addiction in patients studied in present series

In the present series, addiction was noted in most of the patients. Smoking either as bidi or cigarette is the leading form of addiction, 78% (117/150), in the series. Alcohol consumption was noticed in 51.33% (77/150) of cases. Tobacco chewing (in any form) was also noticed in 46.67% (70/150). Opium addiction was recorded in 17.33% (26/150) (Fig 1).

Table 4: Pre-treatment factors seen in present series

Pre-treatment factor	No. of patients
Diabetes	13
Renal problem	7
Cardiac disorder	6
Anemia (≤ 11 gm/dl)	93

Anemia was the most commonly observed associated pre-treatment factor, seen in 62% (table 4).

Table 5: Site specificity seen in the 150 patients of present series

Site	No. of patients
Lip(upper/lower)	3
Floor of mouth	11
Alveolus/buccal mucosa/ GB sulcus	32
Tongue lateral border	19
Tongue base/ vellacula	24
Tonsils	18
Maxilla	6
Nasopharynx	3
Palate	4
Larynx	14
Pyiform fossa	13
Unknown primary	3

Maximum number of the patients were observed to have the disease at tongue, either base or lateral border of tongue, 28.67% (43/150), followed by alveolus/ buccal mucosa/ and GB sulcus, 21.33% (32/150). Tonsils were also one of the commonest sites (12%) observed in the series. Other sites observed were palate, nasopharynx, maxilla and lips (table 5).

4. Discussion

The study was conducted with the primary aim to know Pre-determining factors for the mucositis. Males were found to have more predilections towards head and neck cancer with p value < 0.01. 102 patients were observed in the overall age

group more than 50 years and p value < 0.01 suggestive of more prevalence of the head and neck cancer after 50 years. P value was highly significant in males > 50 years (< 0.01). This data from ICMR ^[2] suggests male to female ratio of 4:1 for head and neck cancers in India and more predilection towards higher age group i.e. more than 50 years. Smoking in any form was observed in 117 (78%) patients of the present series showing statistically significant (p<0.01) association with head and neck cancers. ICMR data suggests that smoking is the main etiological factor and it increases the risk of developing head and neck cancer by 5-25 folds ^[2]. Zarda consumption was observed in 70 (47%) patients. Alcohol consumption was seen in 51.33% of studied population. However no statistical significant association could be derived. Alcohol is shown to be one of the main additive factors as per ICMR data ^[2]. Poor ODH was significantly associated with the head and neck cancer with p value < 0.01. ICMR data also suggest ODH as one of the causative factor ^[2]. All our patients completed their treatment with in nine weeks (59 days, or 8.5 weeks) and the patients were admitted as per their need and for chemotherapy weekly. The days of hospitalization for mucositis only included the days when patient was admitted with severe mucositis that is grade III/ IV mucositis and discharged. The criteria for discharging the patients was either a reduction in grade of mucositis to grade II or when patient started taking adequate diet. Regarding the pre-treatment factors determining the Frequency of mucositis grade IV, it was noticed in 59% of female patients and 51% of male population in study group. However no statistically significant data could be drawn. All patients were asked for follow-up after the fifteen days and the most patient turned up for same after 18 days with maximum time for first follow-up was 22 days. Most patients were seen with the grade I/II mucositis at the time of follow-up. Mucositis subsided by the time of 2nd follow up in all arms. Only some patients were having the mucositis grade I/ II. All patients were taking orally on follow up.

After 60 years of age group, mucositis grade IV incidence was seen to increase from 50% in below 60 year age group to 56.33%. However no statistically significant data could be drawn in favor of any age group. The meta-analysis study by Trotti *et al.* ^[8] showed higher association of severe mucositis in young age group. In diabetics, the prevalence of severe mucositis was more (64.28%) as compared to the non-diabetic group (52%). Statistical significance could not be drawn but diabetes was certainly leading to the higher frequency of mucositis grade IV in study. Sonis *et al.* and many others have described the positive impact of diabetes in development of mucositis ^[9-12].

5. Conclusion

Severe mucositis was observed more in smokers, alcoholics, diabetics, opium addicts and patients having bad ODH. Most patients present with the primary in tongue either at base or lateral border, followed by alveolus/ buccal mucosa. Anemia was the most commonly observed associated pre-treatment factor, seen in more than half of the patients.

6. References

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