

Oral Complications in Patients Undergoing Radiotherapy for Squamous Cell Carcinoma

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ABSTRACT

Aim: To correlate the relationship between radiation dose and oral mucositis, loss of taste sensation, dysphagia, malnutrition, dental caries, xerostomia in patients and its impact on quality of life.

Materials and Methods: A total of 100 subjects were examined diagnosed with squamous cell carcinoma who undergone radiotherapy

Result: A total of 100 subjects were examined diagnosed with squamous cell carcinoma who undergone radiotherapy, on comparing the data it shows direct correlation between radiation dose and oral complications

Conclusion: The manifold problems, an oral cancer patient may face in maintaining satisfactory oral and dental health, call for individually tailored prophylactic protocols and treatment modes. Frequent professional tooth cleaning by a dental hygienist is often a necessity in addition to the daily self-care by the patient.

Keywords: Oral complications, radiotherapy, squamous cell carcinoma.

INTRODUCTION

The World Health Organization (WHO) describes cancer as “a generic term for a large group of diseases that can affect any part of the body. Other terms used are malignant tumors and neoplasm. One defining feature of cancer is the rapid creation of abnormal cells that grow beyond their usual boundaries, and which can then invade adjoining parts of the body and spread to other organs, the latter process is referred to as metastasizing. Metastases are the major cause of death from cancer.

Cancer treatment is most often based on surgical interventions, radiotherapy, chemotherapy (including targeted therapy), or a combination of

these. Further, adequate symptom management is an inherent part of follow-up and palliative care (PC), with symptom assessment and patient self-reported health as central issues. Poor symptom assessment by medical care personnel and patient misconceptions are important barriers for adequate symptom management

In oncology in general and even more so in PC, numerous concomitant drugs are used to relieve symptoms and to treat co-morbid conditions. Many of these drugs have adverse effects that may lead to hypo-salivation, xerostomia infections (e.g. fungal), taste changes, caries, soreness of oral mucosa, and nutritional deficits.

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Table 1: Demography of the patients.

week	Type of Malignancy	Radiation Dose Linear accelerator (linac) FRACTIONAL DOSE	Oral Complications	VAS
1	CA BM	0-15 Gy	X,1MU,DP	3
2	CA BM	15-30 Gy	X,D,2MU,FI,DP	4
3	CA BM	30-45 Gy	X,D,3MU,FI,DP,T,WL,ML	6
4	CA BM	45-60 Gy	X,D,4MU,FI,WL,ML,T,DP	2

Table 2: Total no of patients 18 (12 male, 5 female) Age 20-70 years.

week	Type of Malignancy	Radiation Dose Linear accelerator (linac) FRACTIONAL DOSE	Oral Complications	VAS
1	CA PALATE	0-15 Gy	X,1MU,DP	5
2	CA PALATE	15-30 Gy	X,D,2MU,T,DP	6
3	CA PALATE	30-45 Gy	X,D,3MU,FI,WL,ML,T,DP	7
4	CA PALATE	45-60 Gy	A,D,4MU,FI,WL,ML,T,DP	3

Table 3: Total no of patients 8 (8MALE) Age 20-70 years.

week	Type of Malignancy	Radiation Dose Linear accelerator (linac) FRACTIONAL DOSE	Oral Complications	VAS
1	CA ALVEOLUS	0-15 Gy	X,1MU,DP	3
2	CA ALVEOLUS	15-30 Gy	X,D,2MU,T,DP	5
3	CA ALVEOLUS	30-45 Gy	X,D,3MU,FI,RC,T,DP	5
4	CA ALVEOLUS	45-60 Gy	X,D,4MU,FI,ML,RC,T,DP	3

Table 4: Total no of patients 11 (7 male, 4 female) Age 20-70 years.

week	Type of Malignancy	Radiation Dose Linear accelerator (linac) FRACTIONAL DOSE	Oral Complications	VAS
1	CA GBS	0-15 Gy	X,1MU,DP	3
2	CA GBS	15-30 Gy	X,D,2MU,DP	5
3	CA GBS	30-45 Gy	X,D,3MU,FI,ML,RC,ON,T,DP	5
4	CA GBS	45-60 Gy	X,D,4MU,FI,WL,ML,RC,ON,T,DP	2

Table 5: Total no of patients 16 (12 male, 6 female) Age 20-70 years.

week	Type of Malignancy	Radiation Dose Linear accelerator (linac) FRACTIONAL DOSE	Oral Complications	VAS
1	CATONGUE	0-15 Gy	X,1MU,D,DP	4
2	CA TONGUE	15-30 Gy	X,2MU,D,DP,FI	5
3	CA TONGUE	30-45 Gy	X,D,3MU,FI,WL,ML,RC,T,DP	7
4	CA TONGUE	45-60 Gy	X,D,4MU,FI,WL,ML,RC,T,DP	3

Short form used:

A-XEROSTOMIA

B-DYSGEUSIA

C-MUCOSITIS

0C-when there are no signs or symptoms.

1C-when the mucosa is erythematous and painful

2C- Characterized by ulcers, and the patient can eat normally

3C-when the patient has ulcers and can only drink fluids.

4C-when the patient cannot eat or drink.

D-FUNGAL INFECTION

E-WEIGHT LOSS

F-MALNUTRITION

G-RADIATION CARIES

H-OSTEORADIONECROSIS

I-TRISMUS

J-DYSPHAGIA

GBS-GINGIVOBUCCALSULCUS

BM-BUCCAL MUCOSA

Oral adverse effects of chemotherapy

- Mucositis
- Xerostomia and hyposalivation
- Altered perception of taste and smell
- Oral infection
- Fungal infections
- Bacterial infections
- Caries
- Gingivitis/Periodontitis
- Sialadenitis
- Swallowing dysfunction

MATERIALS AND METHODS

A total of 100 subjects were examined diagnosed with squamous cell carcinoma who undergone radiotherapy based on oral complications

RESULT

A total of 100 subjects were examined diagnosed with squamous cell carcinoma who undergone radiotherapy, on comparing the data it shows direct correlation between radiation dose and oral complications.

Clinical and demographic data

One hundred patients were recruited for the study out of which 47 (30 male and 17 female) patients diagnosed carcinoma buccal mucosa (CABM), 18 (12 male and 6 female) patients diagnosed carcinoma tongue, 8 (8 male) patients diagnose carcinoma palate, 11 (7 male and 4 female) patients carcinoma alveolous, 16 (12 male and 4 female) patients diagnosed carcinoma gingivobuccal sulcus

Total number of Out of which sixty nine were males and thirty one females, the minimum age of patients 20 years and maximum age 70 years

DISCUSSION

Radiation therapy for HNC is known to substantially reduce quality of life, particularly as it relates to oral health and function (Egestad and Emaus, 2014; Verdonck-de Leeuw et al., 2014). We found that this negative impact persists even 6 months after start of RT. Particularly substantial problems reported by subjects at 6 months related to dry mouth, sticky saliva, swallowing solid foods, and the sense of taste. These findings are consistent with the large reduction in salivary flow at 6 months as compared to baseline. We also found a significant correlation between changes in oral pain and OH-QOL, suggesting that oral pain/sensitivity continues to negatively affect OH-QOL 6 months after start of RT. It should be noted that this study measured QOL

related to oral health specifically and not overall health-related QOL. Other groups have reported lower overall health-related QOL in H&N cancer patients receiving RT (Klein et al., 2014). Oral hygiene practices are very important after H&N RT, due to the increased risks for dental caries and osteoradionecrosis in this population (Hong et al., 2010; Raguse et al., 2016). Study subjects received education and strong reinforcement on the need for aggressive preventive measures, which is part of standard clinical practice at the study. Sites. As a result, we found an increased frequency of using dental floss or other interdental aids at 6 months as compared to baseline. There was also a large increase in the proportion of subjects using supplemental fluoride (with a shift towards use of prescription gels), from 41% at baseline to 68.2% at 6 months after start of RT. While quite positive, these data indicate room for improvement even at our academic centers. It is also recognized that these are subject-reported data that were not independently verified. In future analyses of data from later time points (up to 2 years after RT), we will examine the continuing use of such preventive measures and their effects on longer-term complications such as dental caries and osteoradionecrosis

This is an observational cohort study, and this study design has some limitations. There was no separate control group. Subjects served as their own controls, with measurements compared before and after RT. Based on the knowledge of the effects of RT, it is reasonable to infer that the changes in outcomes seen were related to RT. For example, the biological effects of RT on salivary glands are well documented. It should also be noted that there may be some selection bias due to the inclusion criteria for this study. To be eligible for this study, patients needed to have at least one tooth present after completion of pre-RT dental extractions. Thus, the least motivated patients with the worst oral hygiene may be excluded from the study due to becoming edentulous

CONCLUSION

The manifold problems, an oral cancer patient may face in maintaining satisfactory oral and dental

health, call for individually tailored prophylactic protocols and treatment modes. Frequent professional tooth cleaning by a dental hygienist is often a necessity in addition to the daily self-care by the patient.

General principles for preventing and treating patients with reduced salivary flow, dental caries and oral candidiasis hold true also for oral cancer patients. However, these risk patients mostly need intensified prophylaxis in order to avoid even life-threatening systemic infections derived from the mouth. Good oral health care also directly links with the patient's quality of life.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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