

Dental Prophylaxis why mandatory in all Head & Neck Cancer Patient Prior to Radiotherapy –A Prospective Study

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ABSTRACT :

Introduction

Smoking, tobacco chewing, alcohol consumption and poor oral hygiene are the main risk factors of head and neck cancer. Association between their use and dental pathology is well documented. As a result head and neck cancer patients have higher dental morbidity compared to normal population and which adds on the morbidity primarily due to cancer in these patients. Though it is well known that dental prophylaxis is advisable in every patient before radiotherapy but it is not universally practiced.

Aims & Objectives -

This study was to assess dental morbidity in head and neck cancer patients before start of definitive treatment and after radiotherapy.

Materials & Method -

Study population consists of histologically confirmed 50 patients of head and neck cancer, who have not received any dental treatment after diagnosis of malignancy. Dental health assessment of these patients was done before the start of Radiotherapy and 6 month after the completion of Radiotherapy and morbidity was assessed in the form of Decayed, Missing, and Filled Teeth (DMFT) index and patients were categorized into very low, low, moderate and high risk category.

Result & Conclusion -

Each and every patient of HNCC enrolled in the study had some degree of dental morbidity. One third of patients had dental morbidity ranging from moderate to high risk category which needed active intervention in the form of dental extraction, dentures or root canal treatment. Moderate to severe degree of dental morbidity was increased in 10% of patient post RT. Though this difference was not significant but it has increased the risk of post dental treatment complications.

Keywords :

Head and Neck cancer, Dental morbidity, DMFT Index, Radiotherapy, WHO Oral health assessment

INTRODUCTION

Head & Neck Cancer and dental pathology share etiological agents like tobacco use in the form of smoking and tobacco chewing, alcohol consumption, poor oral hygiene, infection and poor nutrition. In addition, poor dental hygiene is a risk factor for oral cancer. As a result head & neck cancer patients have high grade dental morbidity compared to normal population. This elevates morbidity primarily due to malignancy. Treatment of cancer patients in the form of radiotherapy and chemotherapy has spectrum of orodental complications ranging from minor like dental caries to severe like osteoradionecrosis. This together elevates symptoms like pain, dysphagia, xerostomia, excessive salivation, mucositis, trismus and indigestion. Ideal time for a patient to undergo oral surgical procedures (dental invasive procedures/ intervention) post radiotherapy varies from 6-months to 1 year. Patients undergoing radiation therapy in an effort to decrease the severity of side effects must be monitored for any dental pathology from beginning. Systematically applied oral hygiene protocols may reduce the incidence, severity and duration of oral complications during therapy. It's imperative that patients continue their oral hygiene regimen throughout their course of cancer therapy. Oral exercises should be introduced to reduce the risk and severity of trismus.

Though most oncologists are aware of importance of dental treatment before start of radiotherapy and chemotherapy but it is not universal in practice. It may be due to apprehension of delay in the beginning of definitive treatment, refusal by the patient or lack of resources.

This study was to assess dental morbidity in 50 randomly selected patients of HNC planned for radiotherapy before start of Radiotherapy and 6 month post after radiotherapy.

MATERIALS & METHODS

Patient Population -

of Head and Neck Cancer, histologically confirmed It consists of 50 randomly selected patients Squamous cell carcinoma and aged more than thirty years. Dental health assessment of these patients was done before the start of Radiotherapy and 6 month after the completion of Radiotherapy. Dental morbidity was assessed in the form of **Decayed, Missing, and Filled Teeth (DMFT)** index and patients were categorized into very low, low, moderate and high risk category.

Study Tools-

The oral examination was conducted by a dentist using natural light and standard mouth mirrors and explorers. Patient's oral health was assessed by filling all details of WHO oral health assessment form and dental health was assessed by DMFT index On the basis of DMFT score patients were categorized into very low, low, moderate and high risk category.

Statistical Analysis- Done by chi square test and value $<.05$ was considered significant

OBSERVATIONS & RESULTS

Age Group	Male	Female	Total	%
30-40	6	2	8	16
41-50	11	3	14	28
51-60	13	4	17	34
>60	8	3	11	22
P. Total	38	12	50	

Table 1: Distribution of patient according to Age & Gender

SITE	Number of patients	%
ORAL CAVITY	13	26
OROPHARYNX	22	44
LARYNX	13	26
HYPOPHARYNX	1	2
SEC NECK	1	2

Table 2: Distribution of patients according to Site of Cancer

In study population, most common site of HNC was Oropharynx followed by oral cavity and larynx.

Habit of tobacco use or alcohol was present in about 90% of patients. Smoking was most common habit and was present in 75% of patients and tobacco chewing was present in 50% and alcohol in 25% of patients.

DENTAL MORBIDITY GRADE	PRE RT		POST RT		TOTAL		P Value
	N	%	N	%	N	%	
VERY LOW	26	52	24	48	25	50	<.05
LOW	10	20	8	16	9	18	
MODERATE	6	12	8	16	7	14	
HIGH	8	16	10	20	9	18	

Table 4 : Dental morbidity in pre and post rt patient

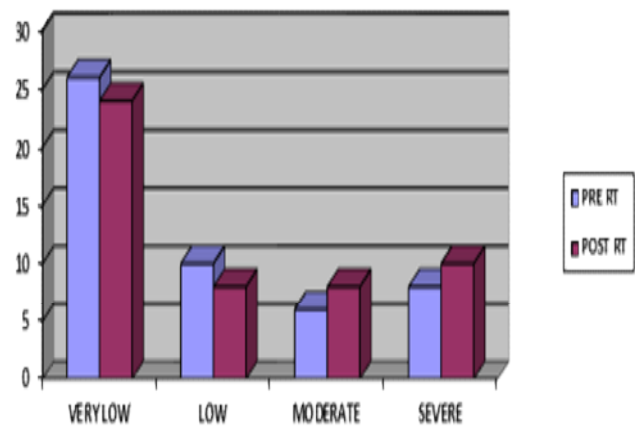


Figure 1 Dental morbidity in HNNC Patients- Pre RT and Post RT

Dental morbidity was present in every patient in study population and dental prophylaxis was required. Moderate to high degree of dental morbidity was present in 28% of patient before RT, which increased by 10% after radiotherapy and they required some active intervention.

AGE GROUP	Mean DMFS		
	Pre RT	Post RT	Total
	30-40	2	2.2
41-50	10	8	9
51-60	10.5	12.5	11.5
61-70	6.66	7	6.8
Total =	7.8	8.04	7.96

Table 5 : Dental morbidity in different age group

Maximum dental morbidity was present in patients of 41-60 year of age group. This group also represents maximum number of head and neck cancer patient in study population. It may be due to common etiology of dental morbidity and head and neck cancer and dental morbidity and mutual effect.

DISCUSSION

Smoking, tobacco chewing, alcohol consumption and poor oral hygiene are the main risk factors of head and neck cancer (1, 2). Association between smoking, alcoholism and tobacco chewing and dental caries is well documented. A study reported that those who smoked more than 15 cigarettes a day had significantly higher number of decayed, missing, and filled teeth and greater the cigarettes consumed per day more were the missing tooth surfaces in a smoker's mouth [3]. There is definite association between smoking and the prevalence of dental caries in adult males. In 1990, Zitterbart did a study in which he showed that Smokers had significantly higher DMFT (Decayed, Missing, and Filled Teeth) score, untreated decayed surfaces, and missing surfaces. Association between smoking and dental caries is well documented in older age groups. [4, 5, 6]

Individuals who chew tobacco appear to have more dental caries than non-users. These patients have significant levels of dental caries, gingival inflammation, soft tissue abnormalities, and tooth erosion [7]. A study showed evidence of poor oral health, and increased risk for the

. development of periodontal disease in patients undergoing treatment for alcohol use disorders. As a result head and neck cancer patients have high grade dental morbidity compared to normal population. This elevates morbidity primarily due to malignancy

Prior dental conditions or diseases including gingivitis, periodontal disease, dental plaque, dental caries, faulty restorations, and improperly fitting prostheses increase the risk for RT-induced mucositis. [8, 9] These dental conditions constitute a reservoir for pathogenic and opportunistic organisms that can contribute to local infections in the inflamed oral mucosa.

Ideally the dental examination and necessary dental treatment should be performed prior to the onset of definitive cancer treatment. Dental complications that occurs post radiation can be managed, to a significant degree by optimal pre radiation evaluation and intervention if required.

Appropriate preventive regimens and timely oral care can minimise complications and improve quality of life [10]. Many oral conditions such as carious teeth, periodontal and periapical pathology, if not treated can result in several complications during the course of radiotherapy as well as after radiation is completed. These conditions may delay or interrupt the delivery of definitive treatment.

Though, there is controversy regarding which teeth need to be extracted prior to radiotherapy of head and neck. All teeth with a questionable prognosis should be extracted. As the treatment of choice, teeth with pulpally involved carious lesions, periapical pathology and advanced periodontal disease should be removed [11, 12]. Other criteria for tooth extraction prior to radiotherapy include lack of opposing teeth, compromised hygiene, partial impaction or incomplete eruption. [13]The ideal time for tooth extraction is atleast 3 weeks prior to initiation of radiation therapy with minimum of 14 days gap between any tooth extraction and delivery of radiation. [14].

Post radiotherapy there is change in quantity as well as pH of saliva. As a result bactericidal salivary proteins are lost. It also decreases the calcium and phosphate ions

necessary to maintain the hydroxyapatite content of tooth enamel and dentin. All these changes contribute to dental caries, hypersensitivity of teeth and demineralization.

Studies have reported that irradiated teeth decalcify more easily than non irradiated teeth and post radiation, there is decrease in vascularity, fibrosis and atrophy of dental pulp[11] After radiotherapy a patient can undergo dental intervention only after 6 months to 1 year.[15] So patient will have to bear any pre-existing dental problem at least for this duration post radiotherapy also. It has been reported that radiation to the head and neck region can cause an increased sensitivity of teeth due to external stimuli [16].

CONCLUSION

The study revealed dental morbidity in almost every head and neck cancer patient that aggravated post radiotherapy treatment in certain cases. Certain complications are associated with dental procedures after radiotherapy treatment and so dental prophylaxis should be done before the radiotherapy treatment.

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