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Epidemiology of Oral Hygiene Function in Head and Neck Cancer

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Abstract

Every year, more than 500 000 cases of primary head and neck cancer (HNC) are projected to be diagnosed in the world. Geographic disparities in HNC incidence rates still exist between and within countries in some cases. Although the prevalence of alcohol and cigarette use varies, these risk variables alone cannot explain geographical differences in HNC incidence rates. Oral malignancies, oropharyngeal cancers, hypo pharyngeal cancers, and laryngeal cancers are also examples of HNCs. Oral hygiene signs such as missing teeth, denture use, bleeding gums, infrequent dental visits, and infrequent tooth brushing have all been linked to the genesis of HNCs. Because of the small number of cases and the lack of specific information on more than one, the causative and independent role of oral hygiene in HNC development has remained equivocal. The majority of studies use oral hygiene as a criterion. Oral hygiene is not a known risk factor for HNCs, and the PAF of oral hygiene to HNCs has not been determined. Poor oral hygiene, regular mouthwash usage, and a lack of teeth brushing were all linked to an increased risk of HNC in separate analyses of Latin American and Central European case–control studies. Our research broadens the scope of this investigation to include countries from five continents and investigates the role of oral hygiene indicators. Oral hygiene and HNC data from the International Head and Neck Cancer Epidemiology (INHANCE)

Keywords: Equivocal; International head; Hygiene

Introduction

Consortium studies were combined. This pooled analysis, which includes oral hygiene indicators and HNCs, is the biggest and most complete assessment of the relationship between oral hygiene indicators and HNCs to date cavity, larynx, hypo pharynx, and oropharynx. After multivariable adjustments, oropharyngeal and pharyngeal malignancies were found to be inversely related to 5 missing teeth, tooth brushing once a day, and regular dentist visits. Brushing teeth once a day and seeing the dentist on a regular basis were found to be inversely related to hypopharyngeal malignancies [1, 2]. After adjusting for mutual oral hygiene variables, missing teeth and wearing dentures had the highest associations with malignancies of the oropharynx, pharynx, and hypopharynx. For gum disease, tooth brushing, and the number of missing teeth, stratified associations between oral hygiene and HNC persisted among participants with risk profiles defined by smoking, alcohol consumption, and geographic region, with consistent directions of association compared to non-stratified results.

After restricting the study to never smokers and never drinkers, a supplement published in Annals of Oncology online shows links with HNC and oral cavity cancer. All good oral hygiene indicators were inversely related with HNC and oral cancer when all oral hygiene factors were corrected for each other (38 percent of the pooled study population, which included Puerto Rico, the Latin American multicenter, and the international multicenter).The magnitudes of correlations between missing teeth and HNC and oral cancer risk increased by 75% and 75%, respectively. When compared to models that were not modified for additional oral hygiene parameters, the results were 107 percent and 107 percent, respectively .When compared to unadjusted models, no gum disease elevated HNC risk by 95% and oral cancer risk by 160 percent. The link between dental visits and HNC and oral cavity cancer was reduced. For gum disease, tooth brushing, and number of missing teeth, stratified associations with HNC persisted among participants with risk profiles defined by smoking, alcohol consumption, and geographic region, with consistent directions of association with non-stratified results supplementary, available at Annals of Oncology online [3].

After restricting the sample to never smokers and never drinkers, the supplement, accessible at Annals of Oncology online, shows links with HNC and oral cavity cancer. All good oral hygiene indicators were inversely related with HNC and oral cancer when all oral hygiene factors were corrected for each other (38 percent of the pooled study population, which included Puerto Rico, the Latin American multicenter, and the international multicenter). The magnitudes of the links between missing teeth and the likelihood of both When compared to models that were not modified for additional oral hygiene variables, HNC and oral cancer rose by 75% and 107 percent, respectively. When compared to unadjusted models, no gum disease elevated HNC risk by 95% and oral cancer risk by 160 percent. The link between dental visits and HNC and oral cavity cancer was reduced [4].

These illnesses occur as a result of neglected health maintenance or as a result of chronic disease, and were found to be independently linked to an elevated risk of HNC. Gum disease has previously been linked to poorly controlled diabetes and smoking in observational studies. These host-compromise characteristics could potentially play a role in the substantial link between gum disease and HNCs [5]. Factors influencing oral hygiene indicators and behaviours that could not be accounted for limited our analysis. Diabetes control and management, as well as a medical history of inflammatory oral and/or systemic disorders like osteoporosis and cardiovascular diseases, might raise the risk of gum disease and tooth loss, which can increase the risk of HNC. The consortium, on the other hand, had already discovered a solution.

Cancers affecting the soft and hard tissues of the head and neck, including the oral cavity, are known as head and neck cancers (HNCs).

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Since 1998, South Korea has shown an annual rise in the prevalence of HNC. Cancers of the tongue, salivary glands, and hypopharynx were more common in South Korea between 1999 and 2012 compared to other cancer types. Chemotherapy combined with radiotherapy, which can cause a variety of discomfort in patients, is typically the main therapeutic choice for locally advanced HNC. Inflammation of the skin and mucosae in the radiation field may be the source of acute discomfort in the oral cavity, which might then result in bad oral hygiene and a low quality of life.

Additionally, different degrees of decreased saliva output have been linked to radiation of the oral cavity. When the parotid gland is exposed to radiation, salivation in particular may be significantly reduced. 8,9 Because saliva performs so many preventive tasks, including regulating plaque pH, preserving tooth structure, and sustaining the normal microbial flora, hypo salivation can lead to poor oral health. 8 Additionally, since radiation may directly impact the mechanical makeup of the tooth surface, it's possible that this contributes to the rapid progression of radiation-induced caries relative to normal caries. 10 The major causes of tooth extraction, dental caries and peri-odontoids, may be made worse by these changed circumstances [6].

Patients with HNC should be informed of the oral complications and the requirement for dental therapy, as per the recommendations for oral management of patients with HNC. 12 It was advised to have more frequent dental checkups, to practise strict oral hygiene, and to continue daily topical fluoride both during and after radiation. Fluoride mouthwashes, a dentifrice with 5000 ppm of fluoride, and daily self-administration of fluoride with a bespoke tray might all be used to produce highly concentrated fluoridation. Additionally, peri-odontitis needs to be completely and quickly treated. 13 Regular monitoring by a general dentist, their assistance, and the patient's full compliance with dental treatment are required to obtain these results.

Materials and methods

The Kyungpook National University Hospital's Institutional Review Board approved this study (KNUMC 2015-05-133-001), and it is listed with the Clinical Research Information Service Registry (number KCT0002807). The 1964 Declaration of Helsink's ethical guidelines were followed while conducting this investigation.

Patients who had been given an HNC diagnosis at the Department of Otolaryngology at the Kyungpook National University Medical Center in Daegu, Korea, and then sent to the Department of Dentistry for dental assessment prior to starting radiotherapy were the participants. Patients were considered eligible if they met the following requirements: I they were receiving head and neck radiation therapy for the first time; (ii) they were mentally and physically able to undergo an oral examination and receive oral health education; and (iii) they had at least four healthy teeth.

These requirements were initially satisfied by 68 of the patients who went to the dental clinic before the start of radiation, consented to the research, and were included. All participants, who gave informed consent, received explanations of the study's goals and procedures. 39 participants, though, left the study for a variety of reasons, including being transferred to other hospitals (5 patients), having their conditions worsen (13 patients), experiencing behavioural issues like exhaustion (5 patients), withdrawing their consents (6 patients), and failing to be tracked down (10 patients). 29 patients ultimately took part in this trial [7].

Surveys

How to complete the survey was explained to the participants by the dental hygienists. The study was conducted to find out whether the participants smoked, drank, how frequently they averaged brushing their teeth each day, and how they felt about their overall oral health. There were three categories for smoking and drinking habits: "none experienced," "did in the past, but not now," and "currently doing." Based on brushing twice a day, the average number of times the teeth were brushed each day was determined. The findings of the subjective assessment of dental health were categorized as "healthy," "normal," or "not healthy."

Medical record investigation

The participant's medical records were used to provide details on the forms of malignancy and the radiation regimen. Based on the histopathological results of the biopsy, cancers were categorised as squamous cell carcinoma (SCC), adenoid cystic carcinoma, pleomorphic adenoma, or other. 33 sessions were used to divide the frequency of radiation into two groups, and 66 Gy was used to divide the dosage into two groups (Figure 1).

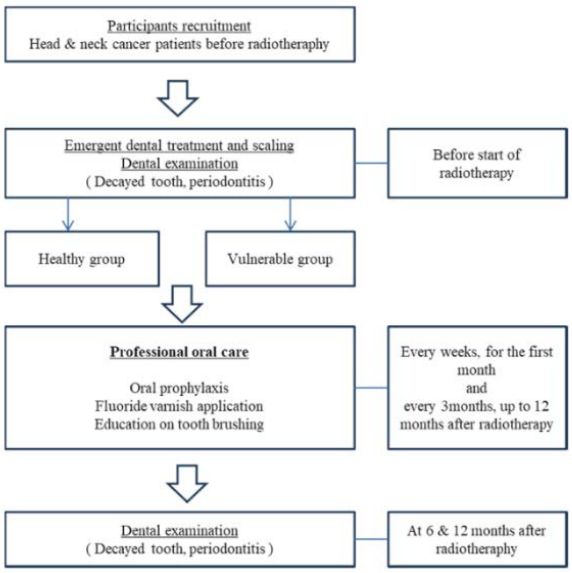

Figure 1: Flow chart of the study.

Oral examination

The same dentist examined the subjects' mouths while they were all seated in dental chairs. There were instances of missing teeth or dental deterioration. Six teeth, the maxillary right first molar, central incisor, maxillary left first molar, mandibular left central incisor, left first molar and mandibular right first molar, were also assessed for plaque and gingival index. The surrounding teeth were inspected if these index teeth were missing. The appropriate region was omitted if the neighboring teeth were also missing. Using Loe and Silness' criteria, plaque and gingival indices were assessed on the mesiobuccal, midbuccal, and distobuccal surfaces of six index teeth. The greatest value of these three tooth surface components was noted and utilised as a representative value for each tooth [8].

Using a 4-point scale with values ranging from 0 to 3, we graded the plaque and gingival indices. A higher score denoted more plaque buildup or worse gingival health. Plaque absence was indicated by a score of 0. Plaque that was imperceptible to the human eye but identifiable with a disclosing solution or a probe had stuck to the tooth, according to a plaque index of 1. Although it was not apparent to the naked eye, a plaque index of 2 or 3 indicated moderate or severe plaque in the gingival tissue and/or on the tooth surface, respectively. An inflamed and healthy gingiva was indicated by a gingival index of 0. A gingival index of 1 showed no bleeding on probing, mild gingiva colour change, mild edema, and mild inflammation. With a gingival index of 2, there was significant irritation, glazing, redness, and bleeding when pricked. A gingival index of 3 showed ulceration, hypertrophy, severe inflammation, and a propensity for spontaneous bleeding.

Results

Based on the prevalence of dental caries and periodontal attachment loss, they were classed as either "healthy" or "vulnerable." The overall traits of the two groups did not significantly differ from one another. 24 individuals had SCCs, while 5 patients had other cancers. The distribution of characteristics associated to cancer and therapy in each group did not differ significantly. The susceptible group, however, was defined as having considerably more decaying teeth and much deeper periodontal pockets than the healthy group [9].

Discussion

After radiotherapy, radiation to the maxillofacial area in HNC patients may permanently harm the surrounding tissues. Xerostomia symptoms are already regarded as irreversible when the total radiation dosage surpasses 30Gy. 20,21 Long-term hypo salivation affects a large number of HNC patients receiving radiation. 22, 23 the salivary glands were expected to suffer irreparable damage because all trial participants received radiation doses that were greater than 30Gy. Therefore, it is crucial for these patients to continue receiving professional dental hygiene treatment even after their radiation has ended. In accordance with our earlier research, individuals with HNC can preserve their oral health by seeing the dentist regularly and receiving competent oral hygiene treatment for the first eight weeks after radiation. 24 In this research, we upheld routine dental care, education during and after radiation, and monitoring of the long-term effects for a year following radiotherapy.

Although radiotherapy patients with HNC were instructed to apply their own fluoride gel using a specially constructed tray, there was evidence of limited compliance. Furthermore, it might be challenging for patients to completely follow these directions in some nations where high fluoride concentrations are not commercially available to the general public. Because fluo- ride varnish could be applied fairly simply and with improved patient compliance, we employed it in our trial both during and after radiation. Additionally, there was no precise and workable methodology that a dental hygienist could use for periodontal treatment.

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