Oral Oncology 50 (2014) 135–140

Contents lists available at ScienceDirect

Oral Oncology

journal homepage: www.elsevier.com/locate/oraloncology

Associations of oral health items of the Vanderbilt Head and Neck Symptom Survey with a dental health assessment

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ARTICLE INFO

Article history:
Received 16 July 2013
Received in revised form 25 October 2013
Accepted 30 October 2013
Available online 14 November 2013

Keywords:
Head and neck cancer
Toxicities
Xerostomia
Dental health
Trismus

SUMMARY

Objectives: The Vanderbilt Head and Neck Symptom Survey (VHNSS) version 2.0 oral symptom subscale addresses underreported oral health issues. We report the associations of xerostomia, dental health, dentures and trismus questions with oral examination findings.
Materials and methods: Between May 2011 and April 2012, fifty head and neck cancer (HNC) patients treated with chemoradiotherapy completed the 50-item VHNSS survey, an oral health assessment by a dentist, salivary flow, and inter-incisal opening (IIO) measurements.
Results: Patient reported "problems with dry mouth" correlated with unstimulated salivary flow (−0.43, $p = 0.002$). "Cracked teeth" (0.55, $p = <0.001$) or "difficulty chewing due to teeth" (0.43, $p = 0.004$) correlated with urgent/emergent dental issues identified on clinical exam. Scores of >4 on any dental question identified 83% of patients with urgent or emergent needs. The ROC curve separated routine from urgent/emergent dental issues (0.89, $p < 0.001$). IIO correlated with reported jaw movement "limitations" (−0.43, $p = 0.002$). Small numbers of patients with dentures precluded meaningful analysis of this subsample.
Conclusions: Clinically significant oral health issues pertaining to xerostomia, dental health and trismus may be identified using the oral health subscale of the VHNSS version 2.0. MASCC guidelines should be followed by patients with xerostomia. The observation that a score of >4 is highly predictive of dental issues is important and needs further validation. If confirmed, this would be a useful screening tool for identifying and referring HNC patients for dental care. Patients with trismus should receive physical therapy.

Introduction

Combined chemoradiotherapy for the treatment of head and neck cancer (HNC) results in significant late, often chronic and debilitating complications [1,2]. The Vanderbilt Head and Neck Symptom Survey (VHNSS) version 1.0 was created to provide timely and focused assessment of signs and symptoms suggesting complications secondary to HNC and its treatment, thus allowing health care providers to address the dynamic supportive care needs of this population. The original tool was directed predominately at acute effects of radiation with or without chemotherapy [3]. It has subsequently been recognized that late effects are of clinical importance and merit ongoing assessment across the trajectory of survivorship. One critical late effect that has often been overlooked and underreported is oral health complications [4]. The Multinational Association of Supportive Care in Cancer/International Society of Oral Oncology (MASCC/ISOO) Study Group conducted a systematic review of reports pertaining to oral health outcomes (OHOs) in the cancer population with emphasis on patients with HNC. They concluded that data regarding the incidence, severity, management, impact and cost of OHOs is severely lacking and recommend the design and implementation of adequately powered multicenter clinical trials to help fill this knowledge gap

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http://dx.doi.org/10.1016/j.oraloncology.2013.10.019

[5]. Furthermore, they recommended that outcome parameters for future use in clinical trials and clinical practice be clearly defined [5]. Currently, none of the patient reported outcome measures commonly used in the HNC population adequately address the issue of oral health related sequela of cancer and cancer therapy.

In order to address this deficiency, we expanded the VHNSS to include an oral health subscale which specifically addressed xerostomia, dental complications, dentures, mucosal sensitivity, taste alterations and trismus. The development and preliminary testing of the VHNSS version 2.0 has been previously reported. In brief, the VHNSS version 2.0 was found to be easy to use, feasible for patients in the outpatient setting and identified an unexpectedly high rate of adverse OHOs. Preliminary testing demonstrated completion time <10 min, full range of response noted for 92% of items, and a high completion rate for each item. Subsequent analysis identified 10 clusters and 3 single items for which internal consistency was good to excellent (Cronbach's alpha was >0.9 for six clusters and 0.7 to 0.9 in 4 clusters). Cronbach's alpha was 0.75 for dental health and 0.92 for xerostomia [6]. The VHNSS was able to detect change over time in functional impairment and symptoms in nine out of ten clusters including dental health and xerostomia [7]. Since there are no validated tools to identify and screen for many important OHOs, we undertook a study to further garner evidence of the utility of the VHNSS 2.0 by associating the oral health clusters with objective dental assessment conducted by a trained oral health care provider. The dental assessment is considered the "gold standard" for identification of oral health problems. Herein we report the findings pertaining to 3 OHOs: (1) xerostomia, (2) dental health, and (3) trismus (Table 1).

Methods

Patient population

Fifty patients with a history of HNC who had completed primary or adjuvant chemoradiation were enrolled in the study. Patients were recruited from the Henry Joyce Outpatient Cancer Clinic of the Vanderbilt-Ingram Cancer Center between May 2011 and April 2012. Enrolment criteria included: $\geqslant$18 years of age, able to speak English, and provide written informed consent. Patients completed a demographic survey and the VHNSS version 2.0. Study staff completed a disease treatment summary form. Subsequently, patients underwent a dental evaluation, conducted by the study dentist, including: a dental exam, salivary flow measurement, inter-incisal opening (IIO) measurement, and a panoramic dental X-ray. Patients found to have urgent/emergent dental issues were directed to their primary dentist for care. Patients without dental insurance were referred for indigent care. The study was approved by the Scientific Review Committee and the Institutional Review Board. All patients signed informed consent.

Table 1
Oral health related questions: VHNSS version 2.0.

Item no.	Xerostomia
14	I have problems with dry mouth
15	Problems with dry mouth make chewing and swallowing difficult
16	Problems with dry mouth affect my ability to sleep
17	Problems with dry mouth affect my ability to talk
	Dental Health
39	I have difficulty chewing because of my teeth or dentures
40	My teeth are sensitive to hot, cold or sweet foods
41	My teeth feel looser
42	My teeth are cracking or chipping
	Dentures
43	I have trouble with my dentures
	Trismus
49	I have limitations in the ability to open or move my jaw

VHNSS = Vanderbilt Head and Neck Symptom Survey.

Measures

Demographic survey

The demographic survey recorded general epidemiologic data including: gender, age, race, ethnicity, marital status, highest grade of education, work status, household income, insurance status, transportation access, alcohol and tobacco use.

Disease and treatment

The disease and treatment summary form included: date of diagnosis, stage, primary site, pathology, date and type of surgery, beginning and end dates of chemoradiotherapy.

VHNSS version 2.0

The VHNSS version 2.0 is a fifty item survey that assesses HNC related symptom burden. See Table 1 for wording of selected oral health related items. The response time frame "within the past week" were scored using a Likert scale between 0 (none at all) to 10 (severe symptoms). Only the 2 clusters and individual items listed in Table 1 that address xerostomia, dental health, dentures and trismus were included in this analysis. The Cronbach's alpha for the xerostomia cluster scores in this study was 0.90; the Cronbach's for the dental health cluster was 0.80.

Panorex

A panorex is an extra-oral 2-dimensional dental X-ray that displays the maxilla, mandible, all teeth, the temporomandibular joint (TMJ), nasal cavity and frontal/maxillary sinuses. For the purposes of this study, we developed an assessment form to capture data in a constant and reproducible manner. The Panorex Evaluation Form is designed to be interpreted by dentists or dental radiologists. Further testing of this tool is ongoing and will be reported separately.

Oral Health Assessment Form

The Oral Health Assessment Form was developed by the authors to provide a comprehensive and systematic assessment of dental health with emphasis on oral health issues common to HNC patients treated with radiotherapy. The tool was designed to be administered by an oral health professional. Further testing of this data collection tool is ongoing and will be reported separately. The tool included: (1) descriptive data regarding decayed, missing and filled tooth surfaces; (2) visual examination of all teeth surfaces (coded on a scale of 0–6); (3) tactile exam: smooth enamel included superficial defects if open and with borders smooth to probing; rough enamel included surfaces affected by caries, not due to staining, mineralized debris, or calculus. The number of surfaces affected was noted. Dentin was scored as hard or rough/soft to probing. The later included irregular breakdown detected with a standard dental explorer; (4) salivary gland function; (5) gingival and periodontal status (including periodontal probing); (6) issues related to dentures (if applicable); and (7) dental treatment recommendations.

Based on the Oral Health Assessment and review of the panorex, the dentist categorized patients as requiring routine, urgent or emergent dental care. "Emergent" dental processes included: (1) active signs of infection such as clinical suppuration and symptomatic dental radiolucencies; or (2) fractured, nonrestorable teeth affecting quality of life (QOL). "Urgent" dental processes included: (1) periodontal disease with evident bone loss; or (2) dental