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Swallowing ability and its impact on dysphagia-specific health-related QOL in oral cavity cancer patients post-treatment

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ABSTRACT

Purpose: The purpose of this study was to identify the characteristics of swallowing ability, depression, and dysphagia-specific health-related quality of life (QOL), and the predictors of dysphagia-specific health-related QOL in oral cavity cancer patients post-treatment.
Methods: A cross-sectional study of 151 oral cavity cancer patients was performed at a medical center. Patients were assessed for swallowing ability, depression, and dysphagia-specific health-related QOL. Multiple stepwise regression was used to identify factors related to dysphagia-specific health-related QOL.
Results: Of the 151 patients surveyed, the top swallowing impairments were difficulty swallowing dry foods, difficulty swallowing hard food, and swallowing problems interfering with enjoyment or QOL. Patients with tumors of the tongue had worse functional dysphagia QOL than those with cancers in other locations. Patients with buccal cancer had worse overall dysphagia QOL, functional dysphagia QOL, and physical dysphagia QOL than patients with cancers in other locations. Patients with poor swallowing ability were more likely to have worse global dysphagia QOL. Emotional dysphagia QOL was associated with poor swallowing ability and depression. Poor swallowing ability, higher level of depression, and tumors of the tongue were associated with the worst functional dysphagia QOL. Patients with poor swallowing ability, higher level of depression, and less functional oral intake were more likely to have worse physical dysphagia QOL.
Conclusion: Swallowing ability and depression were the most important factors associated with dysphagia-specific health-related QOL. Patient-centered swallowing rehabilitation programs are recommended to help cope with swallowing impairment.

1. Introduction

Oral cavity cancer is one of the most common types of cancer. Oral cavity cancer combined with lip, naso-pharynx, and pharynx involvement is the 7th most common cancer in the world (Stewart and Wild, 2018). There are approximately 4100 newly diagnosed oral cavity cancer cases in Taiwan annually (Taiwan cancer registry, 2009). More than one half of patients diagnosed with oral cavity cancer have stage III or IV disease, and radical excision and radiation therapy (RT), and surgery with concurrent chemoradiation therapy (CCRT) are the major treatment methods for advanced oral cavity cancer (Shah and Gil, 2009). Operative resection and RT can cause damage to muscles, and cause mucositis, neuromuscular fibrosis, and lymphedema in the oral mucosa and muscle tissue and alter the coordination of the swallowing process (Mittal et al., 2003; Murphy and Gilbert, 2009) resulting in swallowing impairment (dysphagia) (Frowen et al., 2010; Murphy and Gilbert, 2009). Swallowing impairment may be associated with poor oral intake, reliance on feeding tubes, increased morbidity, emotional distress, and increased use of health care services (Gillespie et al., 2004; Lin et al., 2012). Swallowing impairment is also associated with severely diminished quality of life (QOL) (Nguyen et al., 2005).

A prior study found that head and neck cancer patients reported

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swallowing problems and decreased QOL after 3 months (de Oliveira et al., 2017). Another study found that mild swallowing impairment (dysphagia) was associated with decreased overall QOL in head and neck cancer patients post-treatment (Daugaard et al., 2017). Schache et al. (2009) reported that patients with oral tongue lesions had the worst swallowing ability, whereas those with lateral lesions (floor of mouth, mandibular, and buccal) had the best. Lin et al. (2012) showed that depressive symptoms were significantly associated with poorer global QOL and less swallowing function. A study by Pierre et al. (2014) showed that in oral cancer patients who had surgery and microvascular reconstruction, older age, male sex, and postoperative radiotherapy were more associated with a higher level of dysphagia.

Understanding swallowing ability, depression, and dysphagia-specific health-related QOL in oral cavity cancer patients may reveal factors associated with dysphagia-specific health-related QOL. Although some studies have explored the issue of dysphagia-specific health-related QOL, most research has focused on swallowing ability in head and neck cancer patients (Gillespie et al., 2004; Lin et al., 2012; Nguyen et al., 2005; de Oliveira et al., 2017; Daugaard et al., 2017). The purposes of this study were to investigate the characteristics of swallowing ability, depression, and dysphagia-specific health-related QOL in oral cavity cancer patients post-treatment, to examine differences in swallowing ability and dysphagia-specific health-related QOL by cancer subsite, and to identify factors associated with dysphagia-specific health-related QOL in these patients.

2. Methods

2.1. Study design and participants

A cross-sectional, descriptive, and correlational design was used in this study. Consecutive sampling was performed to recruit patients from the Radiation Head and Neck Outpatient Department of a medical center in northern Taiwan between August 2014 and July 2015. The inclusion criteria were: (1) new diagnosis of oral cavity squamous cell carcinoma (OSCC) and patient awareness of the diagnosis; (2) completion of RT or CCRT during the period of 3 months to 3 years prior; (3) agreement to participate in the study after explanation of its purposes and procedures; and (4) 20 years of age or older. Patients were not eligible if they had a mental disorder, physical performance less than 60 or an unstable systemic disease (heart disease, active infection, or other underlying disease), and or any condition likely to cause physical discomfort from disease/treatment (e.g., pain and fatigue) during the research interview.

2.2. Ethical considerations

This study was approved by the Institutional Review Board of the study institution, and a permission certificate was obtained. Written informed consent was obtained from all participants before data collection.

2.3. Data collection procedures

A well-trained research nurse assisted the patients with completing the questionnaires, which took around 10–15 min.

2.4. Instruments

2.4.1. Patients completed the following questionnaires

2.4.1.1. Functional Oral Intake Scale (FOIS). Swallowing ability was assessed using the FOIS. The scale consists of 7 levels. Level 1 through 3 relate to varying degrees of non-oral feeding; levels 4 through 7 relate to varying degrees of oral feeding without non-oral supplementation (Crary et al., 2005). Validity and interrater reliability were established in previous studies (Chen et al., 2018; Crary et al., 2005).

2.4.1.2. Swallowing Performance Status Scale (SPSS). The SPSS was used to assess swallowing ability with respect to volume and viscosities of food. The presence and severity of dysphagia and aspiration risk is graded from 1 (normal swallowing) to 7 (severe impairment) (Karnell and McCracken, 1994). Satisfactory psychometric properties have been shown for the SPSS in a head and neck cancer-related study (Chen et al., 2018; Stenson et al., 2000).

2.4.1.3. Sydney Swallowing Questionnaire (SSQ). Swallowing ability was also assessed using the SSQ (Wallace et al., 2000). The 17-item SSQ determines the subjective perception of swallowing function to food and fluid consistencies, meal duration, and dysphagia symptoms. The SSQ is a 100 mm long visual analogue scale (VAS) for all but one question (question 12 [Q12] of 17 questions). The total score is determined by summing the scores of individual items. The final total score ranges from 0 to 1700, with higher scores indicating more severe symptoms of oral-pharyngeal dysphagia. The upper limit of normal for the SSQ is 234 (Szczesniak et al., 2014), and in this study was taken as the cut-off score where patients were classified as dysphagic. A previous study reported the test-retest reliability, and face-, content-, and construct-validity of this instrument (Wallace et al., 2000). The SSQ is widely used in clinical studies to assess dysphagia symptoms (Chen et al., 2018; Dwivedi et al., 2010, 2012). The Cronbach's alpha coefficient of the study data was 0.92.

2.4.1.4. Hospital Anxiety and Depression Scale (HADS)–Depression subscale. The HADS depression subscale is a 7-item self-reported instrument intended to assess the level of depression (Zigmond and Snaith, 1983). Responses are scored on a scale of 0 (not at all) to 3 (very much). The total possible score range is 0–21, and higher scores indicate a higher level of depression. HADS depression subscale scores were defined as: 0–7, absence of depression; 8–10, borderline depression; 11–21, clinical depression (Zigmond and Snaith, 1983). A previous study reported the psychometric testing results of this tool (Chen et al., 2000). The Taiwanese version of the HADS is widely used in clinical studies to assess depression (Chen et al., 2016, 2017). In the present study, the Cronbach's alpha was 0.84.

2.4.1.5. MD Anderson Dysphagia Inventory (MDADI). The MDADI was developed by Chen et al. (2001) to assess dysphagia-specific health-related QOL. The 20-item MDADI consists of 4 subscales: global (1 question), emotional (6 questions), functional (5 questions), and physical (8 questions). Each question utilizes a Likert scale with scores expressed from 1 (very unlikely) to 5 (very likely). Two questions, Question 5 and Question 15, express in an inverse order. The average score for each question of subdomain is multiplied by 20 to calculate a subdomain score, with a range of 0 (extremely low functioning) to 100 (high functioning). Higher scores mean better dysphagia-specific health-related QOL (Chen et al., 2001). Several previous studies have demonstrated satisfactory psychometric characteristics for this instrument (Chen et al., 2018; Hutcheson et al., 2014; Kendall et al., 2014; Kwon et al., 2013). In this study, the Cronbach's alpha was 0.90.

2.4.1.6. Demographic and clinical characteristics. Patient background information was collected by chart review and included age, gender, marital status, education level, and religion. Disease-related information collected included cancer stage, tumor subsite, type of surgery and other treatments, time since completion of treatment, total radiation dose (cGy), and performance status. The Karnofsky Performance Status (KPS) score was used to assess physical performance. The KPS instrument is an 11-point scale with items ranging from 0 (death) to 100 (normal function) (Karnofsky et al., 1948), and it has been widely used in clinical cancer studies (Chen et al., 2016, 2017, 2018; Huang et al., 2018).