



Age- and localization-dependent functional and psychosocial impairments and health related quality of life six months after OSCC therapy



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ABSTRACT

Objectives: The aim of the current study was to evaluate the functional and psychosocial impacts and changes in overall quality of life (QoL) following oral squamous cell carcinoma (OSCC) therapy in different age groups and in different oral locations.

Materials and Methods: The study assessed questionnaire responses from patients with OSCC (n = 1319) after 6 months of oncologic therapy, as collected in the DÖSAK Rehab Study. Oncological variables, dental status, sensory, QoL, psychosocial outcomes and coping strategies in younger (45–60 years) and older (61–100 years) patients were assessed for different OSCC locations including the entire oral cavity, maxilla, mandible and others besides the maxilla and mandible.

Results: Younger patients were generally less satisfied with their dental status and experienced more sensory and QoL impairments, as well as more psychological burden, compared to the older patients. Depending on the age group, different coping strategies were used. Oncologic therapy targeted to the mandible and other locations besides the maxilla and mandible led to the strongest sensory and QoL limitations.

Conclusions: Regardless of age, oncologic OSCC therapy leads to profound sensory and psychosocial restrictions and to limitations in QoL. Reasons for the poorer functional and QoL outcomes in younger patients include a more invasive treatment and a lower psychosocial resilience. The identification of patients with depressive and dysfunctional coping strategies should be carried out for all ages, but especially in younger patients, in order to develop functional coping strategies through individualized counseling, treatment and rehabilitation.

Registration of clinical trials: Observational study, therefore not required.

Introduction

The incidence of oropharyngeal tumors of the oral cavity (ICD-10) in Germany has been on the rise since 2009, with 66,814 reported cases between 2009 and 2013 [1]. Approximately 59.6% of these patients were older than 60 years [1]. The absolute number of new cancer cases has almost doubled since the early 1970s [1]. One important cause, but not the only one for this increase is the demographic aging of the population during this period [1]. The oral squamous cell carcinoma (OSCC) is the most common cancer of the oral cavity [2]. It has different levels of differentiation and tends to metastasize to the lymph nodes [3]. The most common locations of OSCC include the ventral surface of the tongue and floor of the mouth, sites which account for nearly 50% of all cases, and the retro-molar regions, gingiva, buccal

mucosa, posterior tongue, soft and the hard palate [4].

Oncologic therapy for OSCC has different functional consequences depending on the location of the tumor. Glossectomy (total or partial) restricts speech, mastication, the mobility of the tongue for articulation, transportation of the food-bolus and swallowing [5]. Therapy for OSCC of the floor of the mouth is often associated with resections of the tongue and the mandibular bone. Segmental mandibulectomy disrupts mandibular continuity such as in muscular attachments, soft tissue of the tongue and/or floor of the mouth and sensory and motor nerves, resulting in severe functional and aesthetic sequelae [6–8]. Rim resection does not disrupt mandibular continuity and by the preservation of the mental nerve, has better functional outcomes compared to segmental resection [9]. Resections of the maxilla often lead to oronasal or oroantral connection due to the proximity of the nasal cavity to the

Abbreviations: FKV, Freiburg questionnaire of coping with illness; KKG, questionnaire for the compilation of control convictions regarding illness and health; DS, depressive scale; STAI, state-trait anxiety inventory

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paranasal sinus and the nasopharyngeal space resulting in nasal leakage, which can cause dietary problems and hypernasal speech [10]. OSCC therapy for the oropharynx often results in dysphagia [11]. The multimodal treatment of OSCC therapy includes neck dissection, and radiation therapy (RT) for metastatic tumors and/or chemotherapy often leading to additional impairments.

The oncologic therapy for OSCC thus often has extensive effects on the patient's vital functions such as breathing, swallowing, ability to talk, physical appearance and thus on their quality of life (QoL) [12]. Reduced QoL therefore reflects the psychosomatic impact of impaired function, pain, appearance and the fear of cancer recurrence [13].

Current treatment of head and neck cancer patients suggests that surgery, radiotherapy and chemoradiation are equally efficacious in older and younger patients [14]. The limited data on QoL indicate that it is not significantly reduced in older patients, who experience less QoL difficulties than their younger peers [14].

The aim of the current study was to evaluate the range of functional, psychosocial and QoL issues that are related to OSCC therapy in different age groups and in different oral regions.

Material and methods

Data collection

Data from 1319 patients with OSCC treated at 38 hospitals in Germany, Austria, and Switzerland before 2000 were evaluated in this cross-sectional study. Inclusion criteria were surgery for OSCC with or without adjuvant therapies, ability to complete German-language questionnaires, and a minimum of 6 months postsurgical follow-up. Both the physician questionnaire and the patient questionnaire (Bochum Questionnaire on Rehabilitation) [15,16] were assessed. All participants in the DÖSAK Rehab Study provided informed consent, and approval of the Institutional Ethics Review Board of the Ruhr-University at Bochum (Bochum, Germany) was obtained for this study.

Physician questionnaire

The physician questionnaire reviewed demographic data (age, gender), operative variables (TNM classification, tumor localization) and treatment methods (RT, chemotherapy, neck dissection). Tumor size (T) was classified according to the Union Internationale contre le Cancer (UICC; T1, 2 cm; T2, > 2–4 cm; T3, > 4 cm; T4, infiltration of adjacent structures).

Patient questionnaire (Bochum Questionnaire on Rehabilitation)

The Bochum Questionnaire on Rehabilitation consists of 147 items focusing on morphological, functional, and psychosocial aspects of rehabilitation [15,16]. For the present study, the functional, and psychosocial status, as well as QoL were evaluated at least 6 months after the surgical intervention.

To determine the functional status of the patients, their dental status/rehabilitation and sensory impairments were assessed. Participants were asked about their dental status, including edentulism (yes/no), number of teeth lost during therapy (none, 1–5, 5–10, > 10), dentures (partial, total, defect, implant-borne, none) and satisfaction with dentures (not at all, mainly not, moderately, mainly, very, no denture). Questions concerning sensory impairment included hypesthesia of the lip/chin, cheek, ear, tongue, and neck (yes/no). Scarring of the face/neck (five-point Likert scale), facial nerve paresis (incomplete eye closure, hanging corner of the mouth, frowning impossible, lip closure impossible and mimic muscles restricted) were also assessed. The pain was enquired for the oral cavity, face, temporomandibular joint (TMJ), head others, neck, and shoulder (yes/no).

General QoL was evaluated as a single-item on a scale of 0 to 100, where 0 marked worst imaginable and 100 very good. Since the QoL

assessment is not linear, cut off points were chosen for very unsatisfied (score, 0–50), rather satisfied (score, 51–80), and very satisfied (score, 81–100). The list of impairments assessed 19 items resulting either from the disease itself or from the subsequent therapy compiled from the experience of the operating surgeons. Impairments included restricted function (speech, mobility, taste, smelling, and breathing), pain, appearance, as well as difficulties with ingestion and swallowing. Participants ranked each impairment on a five-point Likert scale. The results for all 19 impairments were summed up as a severity score (low: none, weak, medium; increased: strong, very strong).

The psychosocial status was determined by questions regarding avoidance (eating, speaking, public appearance) (yes/no) and using short-form standardized tests. To record the psychological variables, two items per factor that had the best characteristics were selected from the calibrated and standardized questionnaires (FKV, KKG, DS and STAI)¹: (1) loading of the various factors, (2) selectivity, (3) face validity and (4) tolerability for patients regarding type and number of questions [17]. The FKV¹ measures clinically relevant mechanisms for coping with the illness on cognitive, emotional, and behavioral levels (five-point Likert scale, score range 2–10) [18]. The KKG¹ investigates specific health- and disease-related control beliefs of the patient (six-point Likert scale, score range 2–12) [19]. The DS¹ according to Zerssen [20] determines the presence and the extent of depressive, anxious, or nervous discomfort without giving a clear nosologic diagnosis (four-point Likert scale, score range 2–8) [20]. The STAI¹ according to Laux [21] captures the anxiety states and characteristics (four-point Likert scale, score range 2–8). To ensure better comparability and presentation of results the reported negative impacts for each sub-scale of FKV¹, KKG¹, DS¹ and STAI¹ are displayed in groups 2–4, 5–7/5–8 and 8–10/9–12, respectively. A maximum score of 4 was interpreted as low or not pathological, and scores higher than 4 were considered increased or pathological [22].

Statistical analysis

The data were analyzed using SPSS (version 22 for Windows, SPSS Inc., Chicago, IL, USA). Data are shown as mean (MV) and standard deviation (SD). Cross-tabulations using the Pearson's chi-square tests were employed to compare age-groups and the post hoc Bonferroni Z-test was used to compare age-groups within the sub-scale categories. Differences between groups were stated significant if $P < 0.05$.

Results

Physician questionnaire

Of the 1319 patients 332 [25.2%] were women, and 987 [74.8%] were men. While 674 (51.1%) patients were 45 to 60 years old (younger, group A) and 645 (48.9%) of them were 61 to 100 years old (older, group B). Besides surgical therapy, 53.9% of the younger and 44.9% of the older patients received additional RT, while 20.2% of the younger and 18.7% of the older patients received additional chemotherapy. Neck dissection was performed in 51% of the younger and 37.2% of the older patients.

OSCC was diagnosed in the maxilla in 105 patients (7.9%), which included 37 [35.2%] from group A, and 68 [64.8%] from group B. It was diagnosed in the mandible in 186 patients (14.1%) of which 92 [49.5%] were from group A and 94 [50.5%] were from group B. In the remaining 1028 patients (77.9%) OSCC was diagnosed in regions others than maxilla and mandible and included 545 [53%] patients from group A and 483 [46.9%] from group B. The patient demographic characteristics have been summarized in Table 1.

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