



Review

Functional and cognitive impairment, social environment, frailty and adverse health outcomes in older patients with head and neck cancer, a systematic review



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ABSTRACT

Objectives: Older head and neck cancer patients are at increased risk for adverse health outcomes, but little is known about which geriatric assessment associates with poor outcome. The aim is to study the association of functional or cognitive impairment, social environment and frailty with adverse health outcomes in patients with head and neck cancer.

Methods: Four libraries were searched for studies reporting on an association of functional or cognitive impairment, social environment and frailty with adverse outcomes in head and neck cancer patients.

Results: Of 4158 identified citations, 31 articles were included. The mean age was ≥ 60 years in twelve studies (39%). Geriatric conditions were prevalent: between 40 and 50% of the included participants were functional impaired, around 50% had depressive symptoms, and around 40% did not have a partner. Functional impairment was assessed in 18 studies, two studies reported on a cognitive test, eight studies examined mood and social status was depicted by 14 studies. None of the included studies addressed frailty or objectively measured physical capacity such as hand grip strength, gait speed or balance tests. In 64% of the reported associations, a decline in functional or cognitive impairment, mood or social environment was associated with adverse outcomes.

Conclusion: Functional and cognitive impairment, depressive symptoms and social isolation are highly prevalent in head and neck cancer patients and associate with high risk of adverse health outcomes. In the future, these measurements may guide decision-making and customize treatments, but more research is needed to further improve and firmly establish clinical usability.

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Introduction

With population ageing there will be an increasing number of older patients with cancer. This trend can also be observed in the patient population presenting with head and neck cancer. In the USA, it is estimated that between 2010 and 2030 the incidence of oral cavity and pharyngeal cancer in people aged 65 years and over

will approximately increase from 19,000 patients in 2010 to 31,000 patients in 2030. This would be an increase with more than 60% [1]. Older patients are very heterogenic with respect to functional capacity, cognitive functioning, mobility and frailty, therefore it remains challenging to identify older patients who are at highest risk for adverse health outcomes such as delirium, side-effects, prolonged length of hospital stay, reduced quality of life or mortality. Besides, head and neck cancer patients have a severe prognosis with an estimation of 50% after 5 years with large variations across tumor sites [2,3]. However, the prognostic value of functional capacity, cognitive functioning, mobility and frailty to assist clinical decision making in older head and neck cancer patients has not been systematically evaluated.

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Head and neck cancer patients have a high prevalence of previous excessive alcohol drinking and smoking [4–6] putting this group at high risk for deterioration in functional [7] and cognitive decline [6,8]. Previously identified risk predictors in older patients with head and neck cancer are the burden of comorbidities [9] and nutritional status [10,11]. A recent review concluded that there was strong evidence for a positive association of pre-treatment physical functioning with survival and change in global quality of life [12]. But, with regard to other HRQoL domains (emotional, cognitive and social functioning) there was insufficient evidence. In other fields of geriatric medicine the value of measures of functional capacity, cognitive functioning, the role of social environment and frailty [13–15], has been firmly established, but these have not been reviewed for older patients with head and neck cancer.

Therefore, the aim of this present systematic review is to study the association of functional or cognitive impairment, social environment and frailty with adverse health outcomes in patients with head and neck cancer.

Methods

Search strategy

We aimed to identify original longitudinal studies in head and neck cancer patients in which the association between a measurement of functional and cognitive impairment, social environment or frailty prior to treatment initiation and adverse health outcome after follow-up was examined. A head and neck tumor was defined as cancers in the sinonasal, nasopharyngeal, oral, oropharyngeal, hypopharyngeal, supraglottic, glottis, subglottic regions or laryngeal cancer. Since the etiologic, risk factors and treatment for skin tumors and thyroid cancer are different from mucosal tumors, skin tumors and thyroid cancers were not included in the search. As baseline measurement we assessed the presence of functional impairment (including assessment of functional performance, mobility, and objectively measured physical capacity such as hand grip strength, gait speed or balance tests), cognitive impairment (including assessment of cognition, dementia diagnosis, and mood or depression), social environment (living situation, social support and marital status) and frailty (the use of a frailty index or instrument such as Fried Frailty Phenotype or the Groningen Frailty Indicator). We assessed adverse health outcomes as mortality, functional or cognitive decline, adverse events during or after treatment (such as side-effects or delirium), prolonged length of hospital stay (LOS) and health related quality of life (HRQoL) of global quality of life (QoL) after follow-up.

On April 28th 2016, we searched four electronic bibliographic databases (PubMed, Embase, Web of Science and the Cochrane Library) using synonyms of head and neck cancer, combined with synonyms of the different domains of geriatric assessment. No limits in age were applied. For full Medline search, see Supplemental Material A.

Article selection

The eligibility of all studies identified by the search was independently evaluated by two of the authors (F.v.D. and A.S.). Of any article that seemed potentially relevant based on title and abstract, full text was retrieved and screened. Studies were included if the full text contained original data reporting on an association between any geriatric measure at baseline and outcome after follow-up in head and neck cancer patients in a longitudinal study design. In case of disagreement between the two authors (F.v.D., A.S.), consensus was reached after discussion with

two other co-authors (S.P.M., L.vd.V.). The reference list of the included publications was used for cross-referencing to ensure we identified all relevant articles.

Data extraction and quality assessment

Items extracted from each study included: publication data (author, year), study design and setting, patient characteristics (sample size, mean age, treatment modality), tumor type and tumor site measurement of functional or cognitive impairment, social environment or frailty, follow up duration, outcome measure and results of the association functional and cognitive impairment, social environment and frailty with adverse health outcome. Treatment modality can include therapy with a curative intent such as surgery, radiation therapy, chemoradiation (or as a combination) or with no curative intent such as chemotherapy, and also no treatment with palliative intent was taken into account as a treatment modality. To assess the methodological quality and risk of bias of the included studies, we adapted the Newcastle-Ottawa scale [16] to the purpose of this review (Supplemental Material B). In case of disagreement between the two authors (F.v.D., A.S.) with regards to data extraction or quality assessment, consensus was reached after discussion with the other two co-authors (S.P.M., L.vd.V.).

Data presentation

Study characteristics are tabulated per individual study. Accumulated descriptives of the selected studies are presented by calculating the proportion of studies reporting on measurement of functional or cognitive impairment, social environment or frailty, endpoints or treatment modalities. Sample size aggregate of the included studies is expressed as median- and interquartile range (IQR), calculated with SPSS software version 20. Main findings with respect to the association of measurement of functional or cognitive impairment, social environment or frailty with outcome are tabulated. In case the hazard ratios (HR), odds ratios (OR) and relative risk (RR) are at least adjusted for age in the multivariate analysis this is mentioned as aHR, aOR and aRR. If studies are adjusted for other factors than age, this is reported in the abbreviations.

Results

Search results and study selection

The database searches identified 4158 unique citations (Fig. 1). After the initial screening of title and abstract, 106 articles were considered potentially eligible. After full-text review, another 76 were excluded; the remaining 30 articles were included. Cross referencing yielded one additional relevant article, which resulted in a total of 31 studies that were included in the present review.

Study characteristics

Table 1 shows an overview of the study characteristics of the 31 included studies. The median sample size of all 31 studies included was 306 (IQR 124–600) and the mean age was over 60 years in twelve studies (39%). Twenty-one studies (68%) were conducted in Europe, the United States or Canada. Most studies consisted of head and neck cancer patients with various cancer types and locations combined, six studies included patients with a specific kind of tumor, five studies had specific inclusion criteria such as stage III/IV or (locally) advanced cancer and six studies included only one treatment modality. Only three studies focused exclusively on older patients and included age ≥ 70 years in their study population [17–19]. Several studies used specific exclusion criteria: four

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