Assessment of quality of life in oral cancer

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Abstract

Quality of life (QL) in oral cancer patients has become one of the most important parameters to consider in the diagnosis and post-treatment follow-up. The purpose of this article has been to review the papers published that study the QL in oral cancer patients, the different QL questionnaires used, the clinical results obtained, and the systematic revisions available in the indexed literature for the last 10 years.

The term QL appears as a keyword in an increasing number of articles throughout the past 10 years; however, few studies focus on oral cancer. Most of them assess all head and neck cancers, which conform to a heterogeneous group with several different features depending on location (oral cavity, oropharynx, larynx, hypopharynx, nasopharynx and salivary glands). Most studies evaluate QL in short periods of time, normally within the first year after the diagnosis. Series do not discern between different therapeutic options, and they generally center on Northern European or Northern American populations. There are few instruments translated and validated into Spanish that measure QL, a fundamental characteristic to link QL to own patients' socio-cultural parameters. Data related with QL are mostly related to patient (age, sex, co-morbidity), tumour (location, size), and treatment (surgical treatment, radiotherapy association, reconstruction, cervical dissection, and/or feeding tube). Nowadays QL's assessment is considered an essential component of an oral cancer patient as well as the survival, morbidity and years free of disease. Although many aspects related to QL in oral cancer patients have been published throughout the past 10 years, more systematic research is needed to be able to apply it on a daily basis.

Key words: Quality of life, questionnaire, oral cancer, head and neck cancer.

Introduction

Oral cancer normally causes an important lack of quality of life (QL) in patients. After the diagnosis and treatment of a patient with oral cancer, the mostly values of the orofacial sphere affected are deglutition, mastication, salivation and speech skills. Patient's and family's social relationships can also be affected, prompting isolation and a loss of general cognitive, social, emotional or physical functions (1). This will determine a decrease in general QL assessment and specific items that measure oral cavity and facial esthetic functionality (2).

At first, oral cancer patients' main concern is to survive, even over a possible secondary functional deficit due to treatment. However, after treatment, keeping and improving QL concerns arise. An example of this behaviour is a patient with an advanced oral cancer with osseous involvement. In this situation, therapeutic options are limited to radical surgery with osseous reconstruction along with adjuvant radiotherapy, which will cause an inevitable functional deterioration. Some patients can even turn to a feeding-tube which will allow feeding. This optimum therapeutic approach from the point of view of the medicine based in evidence would become intolerable for a specific patient, causing a high level of dissatisfaction. Therefore, before deciding on an oral cancer treatment, we have to be aware of long term after-sequels and side effects in QL terms (3), because an extension in a patient's survival does not necessarily mean an improvement in QL results.

This article reviews the papers published about QL in oral cancer in the indexed literature for the last 10 years, analyzing the instruments used for its measurement, and how factors depending on the patient, the tumour and the treatment influence on QL.

QL definition

QL terms have been used since Aristotle, when QL meant happiness. In 1947, the WHO defined it like a complete physical, mental and social welfare state and not only the absence of the disease. In 1977, QL was introduced as a keyword in the United States National Library of Medicine. Since that moment, the interest in head and neck cancer QL have increased as well as the number of articles which have included QL as a keyword (Table 1). However, when QL in relation to oral and oropharynx cancer is researched, there are smaller amounts of articles found in the PubMed indexed literature.

QL related to health implies symptoms' assessment, psychological and functional aspects gathered and measured by generic and specific questionnaires. Some authors describe QL as welfare state along with patient's satisfaction. Other authors relate QL as the difference between the patient's expectations and what they can really perceive. Shumacker and Naughton (4) placed QL in a health field and defined it as a subjective evaluation where health state, received care and promotion activities influence on people's capacity to achieve and maintain their life goals. This function includes physical, social and cognitive functions, mobility and self care along with emotional welfare (5). Therefore, QL is a multidimensional concept.

QL importance

Traditionally, the value that has been used in order to measure success or failure in cancer treatment has been survival, understood as a period free of disease. Nowadays, QL in relation to health has gathered more importance because, although therapeutic measures achieve patients' survival, at the same time they cause a QL impoverishment (3). QL questionnaires have the advantage of gathering the patients' most common problems in a structured way and furthermore, ranking its intensity. This allows to elaborate a more exhaustive clinical control of patients and to develop larger clinical samples from a series of common problems.

Several studies in the literature reviewed show that head

Table 1. Number of articles including QL as a keyword.

		KEY WORD		
		Quality of Life + Head and Neck Cancer	**Quality of Life + Oral Cancer**	**Quality of Life + Oral and Oropharyngeal Cancer**
YEARS	**till 1989**	54	28	3
	1990 -1994	81	38	4
	1995 -1999	419	61	15
	2004 - 2000	734	134	13
	2005	123	10	9
	2006	135	19	8
	2007	144	26	7

and neck cancer constitute a very heterogeneous group due to its location and behavior, although they belong to the same anatomo-pathological family (oral cavity, oropharynx, larynx, hypolarynx, nasopharynx, paranasal sinus and salivary glands). These differences become obvious even when a difference has to be drawn between oral cancer and oropharynx cancer (6). In oral cancer, the disease is responsible for the deterioration of multiple functions, many of them not likely to be replaced in the main areas: eating, talking and esthetic appearances, which determine a significant social and psychological morbidity.

QL assessment
Since QL was considered an important value to analyze the progression in oral cancer, multiple methods have been developed in order to gather the data. Diary and closed- and open-ended psychological interviews with a different structure have been used, which preceded regulated questionnaires with a precise number of graded questions (7).
Many QL components cannot be directly observed and must be evaluated obtaining a QL value, which can be measured indirectly by asking a number of questions or items, each of them measuring the same concept. These questions are proposed to the patient and the answers are transformed into data that can be combined to obtain sets of values which represent certain dimensions. To choose the questionnaire, a transversal or longitudinal design should be done with a large sample, knowing the available resources, what is to be measured, and choosing the instrument that best adapts to our own needs. This questionnaire

is normally answered by the patient, which minimizes any interviewer's subjective assessment and allows it to be reproduced in other similar circumstances.
A great variety of oncology questionnaires for general use exist in the English language, but less are focused on the oral cavity. The main qualities they must fulfill are (8): validity (degree in which the questionnaire measures what it really wants to measure), reproducibility (necessary in successive repetitions), consistency, reliability and sensibility to change. They must be multidimensional, structured with spheres or subscales that analyze several functions or symptoms related to the disease. They must be brief (maximum 50 items) and easy to understand and answer. The answers must be simple with a low–high graduation (standard ordinal answers). The patient must be able to answer them in order to avoid underestimations and bias from the interviewer. They must be used in patients with an appropriate sample size. They must be adapted to the cultural environment where they will be used, equivalent to the original in a technological, semantic and conceptual level.

Types of questionnaires in oral cancer QL
Mainly, literature refers to four types of questionnaires which measure QL in oral cancer (Table 2):
1. Non-specific questionnaires of disease which try to measure the patient's general functional, familiar, social and psychological status.
2. Non-specific questionnaires of cancer symptoms and signs such as fatigue, pain, dysphagia, nutrition, cough, sleep and nauseas.

Table 2. Questionnaires which measure QL in oral cancer.

Non-specific questionnaires of the disease
▪ Physical function: Karnofsky, ECOG and OMS scale
▪ Emotional function: Hospital Anxiety and Depression, Profile of Mood Status and Global Assessment of Recent Stress
▪ General: Memorial Symptom assessment Scale, General Health Questionnaire, Sickness Impact Profile, SF-36 and Nottingham Health Profile.
Non-specific questionnaires of cancer
▪ Functional Living Index, Rotterdam Symptom Checklist, Spitzer Quality of Life Index, Cancer Rehabilitation Evaluation System, Functional Assessment of Cancer Therapy and European Organisation for Research and Treatment of Cancer QLQ C30.
Specific questionnaires of head and neck cancer
▪ Function al Assessment of Cancer Therapy, Head and Neck Subscale, Functional Status in Head and Neck Cancer, Head and Neck Cancer Specific Quality of Life, Head and neck Survey, McMaster University H&N Radiotherapy Questionnaire, Quality of Life Questionnaire, University of Washington Quality of Life Scale and EORTC Quality of Life Head and Neck 35.
Specific performance questionnaires of head and neck cancer
▪ Functional Intraoral Glasgow Scale, Obturador Functioning Scale and the Performance Status Scale for Head and Neck Cancer.

3. Specific questionnaires of oral cancer symptoms and disorders such as mouth dryness, pain, speech, swallowing, smell and taste.
4. Specific performance questionnaires in oral and pharynx cancer such as feeding, chewing, and eating and talking. Considering the peculiar characteristic of these questionnaires, it can be observed that many of them are not useful for specific oral cancer use. Within the questionnaires that measure QL in oral cancer, only the European Organization for Research and Treatment of Cancer EORTC-QLQ C30 (8,9) and the Rotterdam Symptom Checklist (10) present Spanish valid adaptations. Nevertheless there are others questionnaires also being used that are in the process of being adapted or translations into Spanish without a scientific validation yet. Both questionnaires measure similar concepts, although the second one includes specific chemotherapy and sexual symptoms, and it is useful in detecting psychological morbidity. However, it does not include social aspects that take into account the EORTC-QLQ C30 (11). This one, furthermore, presents an additional specific module for head and neck (EORTC QLQ HN 35) (5) that looks like the most advisable one to measure QL in worldwide oncological patients. The EORTC QLQ HN 35 has 35 questions which evaluate the treatment's secondary symptoms and effects: smell, salivation, sensory affectation, speech, social eating, social contact, sexuality, dental problems, oral opening limitations, sticky saliva, cough, sickness feeling, analgesic use, additional nutrition, tube feeding, and gain or loss of weight. It has been used along with the EORTC-QLQ C30 in many large multicultural studies mainly in Nordic countries.

The University of Washington Quality of Life Scale (2) questionnaire has an extended use in oral cancer patients, especially when surgery is used. It is brief and appropriate so it can be used on a regular basis with low cost. It presents an additional module which evaluates emotional status and anxiety. This questionnaire is the most frequently used to evaluate survival by the British Society of Head and Neck. The Functional Assessment of Cancer Therapy-Head and Neck Subscale Questionnaire (12) focuses on the symptoms specially related to head and neck cancer treatment with questions referring to areas such as: eating, breathing, swallowing, external aspects, tobacco and alcohol. It has been developed following psychometric criteria and patients' evaluations.

Factors that affect QL in oral cancer
In an overall QL assessment, it has been found that the relative effect of head and neck cancer and patient's treatment, when compared to other corporal areas, is much more relevant. QL transforms immediately after treating a cancer in this area, and it has been remarked that it takes a year to recover to its initial level (3).
In QL short-term longitudinal studies, we can observe

an improvement in the symptoms after approximately a year, which becomes maximum after 2 or 3 months, recovering the diagnosis level after approximately a year (13,14). There are some values that are not recovered and some others that improve exceeding initial levels. In long-term studies, some authors have found that QL does not reestablish to normal levels until 3-5 years (15) due to parameters that permanently keep diminished as an after-effect of the disease and its treatment. However, for other authors no differences exist between QL after a year or following years (16).
There are a large number of factors that have influence in QL assessment. Most patients in the moment of diagnosis present a bigger or smaller deterioration in specific items of head and neck cancer QL, specifically those referred to oral cavity esthetic and function (6). A smaller percentage of patients refer deterioration of functions and general symptoms of cancer, in particular those patients in more advanced cancer stages, or those who associate older age and concomitant diseases. Answers to questionnaires can be influenced by both, doctor-patient good-relation and family support. Patients with poor QL have fewer predispositions to cooperate completing questionnaires, and even when they do complete them, answers may be altered. In fact, results may vary significantly with what patients define as a "good" or "bad" day (7).

Impact in QL due to sociodemographic aspects
1. Age. Significant correlation between age and some QL variables such as physical function, dry mouth and dental problems can be considered due to the natural course of life and co-morbidity associated to the years gone by (17). On the contrary, social and emotional functions score worse in younger patients. After surgery, older patients achieve a better score in QL, which can be explained according to a social life with less demand of future ambitions (6). With the evolution of cancer, younger patients recuperate higher values in emotional and social functions because they associate it with less co-morbidity along with many defense mechanisms developed throughout time. Standards that rule humor and psychosocial functions are less determined by age and physical functions. Young patients show more emotional and role dysfunctions, a higher risk of psychological stress and an increase in symptoms such as dry mouth compared to older patients in the first post-treatment year. Older patients show a higher score in symptoms such as sexual problems, sensitive alteration and use of nutritious supplements (18-20). Age should not be considered a contraindication for surgical interventions in QL terms.
2. Gender. There is certain variability in reviewed literature about gender influence in QL. Some studies on oral cancer and QL make no difference, and some others on head and neck cancer and QL do so. This again demonstrates that oral cancer is an independent entity with its own special

features and that head and neck cancer make a heterogeneous group whose characteristics do not extrapolate to those shown in oral cancer. For Bjordal et al. (19) QL pre-treatment in women presents worse results than in men, although after a year these differences disappear, finding more mental alterations, alcohol problems and bad nutrition in men. Women show, furthermore, more affectation in mobility, recreation and functions related to food.

3. Marital status. Marital status seems to be a prognosis factor for survival and recurrence in head and neck cancer (21). Patients who do not live with a partner present worse prognosis. It can be due to better hygienic habits and less delay in diagnosis and treatment in married patients or patients with a partner, as well as to a larger social support.

4. Performance status. Low pre-surgery performance status is related to major clinical strictness and worse post-surgery condition. In the same way, pre-surgery physical function is related to overall QL.

5. Tobacco habits. There are few studies in the literature that relate QL to tobacco habits, but it seems that it does not affect QL in an important way. It is clear that there is a smaller recurrence and a larger survival rate in non-smoking patients with head or neck cancer using multivariate analysis.

6. Alcoholic habits. Alcohol is not considered an important prediction factor, although it seems that cognitive functions are related to recurrence and death, which is closely linked to alcohol consume. Allison (22) stated that alcohol consume is related to better physical function and role, better global QL, less pain, tiredness, dry mouth, deglutition problems and, as a consequence, disease feeling.

7. Emotional situation. Patients with head or neck cancer present a large quantity of depressive symptoms related to their disease. Most studies focus on head and neck and not on oral cancer in itself. Strauss (23) observed that pre-surgery psychological status implies a larger or smaller post-surgery adaptation. Optimist patients value better the cognitive function, role and overall assessment of QL. Pessimist patients are more exposed to decease a year after diagnosis than optimist patients, independently from other clinical and socio-demographic variables. Depressive pre-treatment situation is related more strictly to symptoms and a worse post-surgery function, and it is considered that the same factors that cause depressive pre-treatment symptoms are those that cause a poor QL post-treatment. Pre-treatment anxiety is, along with depression, a usual clinical display which continues six months after surgery and minimizes in a year. Facial esthetic involvement along with higher or lower disfigurement levels or post-surgery physical facial changes, mean a disorder in the own patient's corporal image and influences his/her social and personal relations and problems in sexual fields, all

this meaning a larger isolation. De Boer et al. (24) found major survival and minor recurrence in patients with better physical conditions, non-smokers and those who expressed negative thoughts before surgery.

QL impact according to tumoral characteristics

8. Tumoral location. Rogers et al. (21) described worse QL in posterior oropharynx location, especially due to a worse deglutition. Furthermore, worse prognosis in posterior tumors is due to a delay in diagnosis and major tumor size, which therefore determines a worse prognosis.

9. Tumoral size and staging. It is an inverse relationship. The bigger and more advanced tumor has the worse QL. In a long period of time, these differences minimize.

CV impact according to treatment

10. Oncological resection and reconstruction. Jaw resection is the parameter that appears with most relevance in post-surgery QL deterioration terms (25). It has been reported that jaw reconstruction neither contributes in a significant QL increase, nor means an improvement in mastication because several soft parts of the jaw that coordinate the complex process of mastication will be missing. In an early oral cancer stage, where surgery and radiotherapy are associated, differences between marginal and segmented resections have not been found. The worst deterioration in QL is found in those patients with advanced oral cancer, without taking into account resection. In oral cancer it is difficult to evaluate QL related to factors such as size and tumoral stage, resection, reconstruction and radiotherapy because they are related and dependant one on the other. Few longitudinal prospective studies research the effect of a reconstruction in oral cancer (26). These studies include small series of different cancer locations in head and neck with very heterogeneous study groups, diversified reconstruction techniques, different QL valuation tools, all this causing a very complex result interpretation (27). In major tumor sizes, cancer resection often leads to a considerable esthetic deformation that can be minimized with free microvascularized flaps. In transversal studies, free flaps have been associated to a worse QL and the primary closing and the use of laser means better scores in QL per year. Other studies do not find differences using regional or free flaps.

11. Cervical dissection. Worse QL has been found in patients with cervical dissection operation compared to those who have not have it (28), related to the fact that they are patients in a more advanced stage. The cervical dissection, along with the scar consequence of the surgical reconstruction with a myocutaneous pediculed flap is a combination that in a most important way influences in patient's complaints on esthetic and pain in the reconstructed location (29). Possible complications derived from a radical cervical dissection influences in a shoulder dysfunction, secondary to the spinal nerve and an esthetic

deformity due to the sacrifice of the sternocleidusmastoideus muscle. Occasionally, after a cervical dissection, a progressive fibrosis causes pain in the shoulder. Although esthetic and functional morbidity decreases with a cervical dissection, some patients state similar symptoms and weaknesses despite they conserve the spinal nerve and sternocleidusmastoideus muscle. Cervical dissection morbidity emphasizes when adjuvant radiotherapy is administered, provoking fibrosis in the neck.

12. Surgical approach. In anterior location of oral cancers, approach is normally straight. Oropharynx cancer and posterior location might require a mandibulotomy associated with a cheilotomy or a cervical tongue decrease, which may cause mastication, deglutition and speech problems (30).

13. Feeding tube. Gastroscopy tubes employed in oral cancer patients with feeding problems are of great clinical use where tumoral volume and secondary limitations to surgery and radiotherapy do not allow oral ingestion. However, they are related with a less QL because in long-term periods imply more ingest difficulties and therefore, a worse social function.

14. Radiotherapy. In QL transversal and longitudinal studies, patients that receive adjuvant radiotherapy show worse scores in function parameters and greater in symptoms (31). Symptoms more related to radiotherapy are sticky saliva, dry mouth and a decrease in taste. Those patients whom associate radiotherapy and surgery show worse QL compared to those whom only receive surgery, although they are patients which usually are in advanced stage and therefore, have a worse prognosis and overall QL deterioration. Those patients who only receive radiotherapy throughout an extended period of time, present QL deterioration as a consequence of secondary effects as well as of psychological affectation (32).

Future QL perspectives

QL studies in patients with oral cancer have achieved more importance as this tumor is one of the main causes of incidence and mortality in our country. QL studies are aimed at the patients' benefit in order to know their opinion, therefore obtaining different therapeutic utility-cost rate, with a measurable and detectable repercussion in health terms. QL questionnaires have been first used in clinical research studies (33). However, little by little they have been used on a daily basis allowing patients to highlight the aspects of the disease or treatment that are of more concern, and also to share therapeutic decisions with patients. All in all, this will improve the doctor-patients relationship and will prompt a better knowledge of symptoms which will minimize anxiety and psychological problems related to the disease. One of the key factors in completing QL questionnaires is the lack of resources and time. Once a large number of questionnaires have been collected, they can be studied by groups and the data can be transmitted both

to patients and families. Furthermore, patients can keep control of the disease by observing any clinical change in QL evolution, so actions can be taken to improve it. In short-term studies, QL symptoms behavior in a similar way, as they normally decrease in the following months after surgery associated or not to radiotherapy followed by an improvement after a year, which can be similar to the initial stage in some cases or can be maintained in slightly lower levels in an long-term period of time (3,6).

Nowadays, patients with oral cancer concern are orientated towards a multidisciplinary approach establishing an integral treatment strategy (33,34). This strategy must fulfill the patient's needs and expectations from the first consultation until all complications derived from the disease and treatment have been solved. Future lines of work should be aimed not only at the control of the oral cancer, but also to a function and esthetic improvement after treatment, turning to ultimate microsurgery reconstruction techniques and dental restoration with implants, as well as psychological support for the patient and family, all this targeted to achieve patients satisfaction, minimizing resources and alterations caused by iatrogenic. QL questionnaires clinical applications can be directed towards the understanding of emotional and physical after-effects and, therefore, optimized advising, treatment and rehabilitation. QL assessment will help identify more efficient therapeutic procedures and have turned into an essential tool to evaluate treatment results along with mortality, morbidity, survival and recurrence rates as they allow the detection of early recurrences in oral cancer.

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