

Is there a difference in quality of life, comparing summer and winter, in patients who have undergone total laryngectomy?

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Abstract

Introduction: Several studies have implied that patients' quality of life stabilises six months after undergoing total laryngectomy. However, these studies may well have overlooked persistent short term variations in patients' quality of life. The aim of this study was to assess the impact of seasonal change (i.e. summer vs winter) on the quality of life of patients following total laryngectomy.

Methods: A prospective, cross-sectional study of recurrence-free laryngectomy patients was performed, using the European Organization for Research and Treatment of Cancer (version three) QLQ-C30 questionnaires (EORTC QLQ-C30), during January 2004 (i.e. winter), August 2004 (summer) and January 2005 (winter).

Results: Thirty-six patients were entered into the study. The response rate was 70.3 per cent. Patient's time elapsed since surgery varied from six months to 12 years. In all questionnaire domains, responses seemed remarkably consistent over time.

Conclusion: No statistically significant differences were found between summer and winter scores in all the domains analysed by the EORTC QLQ-C30.

Key words: Quality of Life; Laryngectomy; Seasonal Variation

Introduction

A review of literature published in 1986 on head and neck¹ cancer patients highlighted the fact that little was known about such patients' psychosocial problems. Several subsequent studies^{2–18} have improved our understanding of what, to patients, has always been an important topic – their quality of life (QOL). The assessment of QOL has become a major denominator in assessing the impact of cancer treatment on patients.^{3–5} In head and neck surgery, there has been no significant improvement in survival figures over the past three decades;^{6,7} therefore, improving these patients' QOL should be as high a priority as searching for life-prolonging treatments.

Quality of life is a difficult concept to define.² Measuring QOL requires analysis of its various dimensions, usually addressed in QOL studies by domains covering physical, functional, emotional, psychological, social and spiritual wellbeing.^{4,6} The global score also needs to be assessed.⁶ In order to facilitate this process, assessment tools have been developed by various institutions.^{6–12}

Although losing their most important expressive communicative modality (i.e. speech) will obviously affect patients in the long term,^{5,13} other issues, including swallowing, appearance and depression, should also be considered.^{3,7,14,15} These issues do, to some degree, overlap with those of other head and neck malignancy patients,¹⁶ but the formation of an end-tracheostome makes these patients unique and worthy of specific study.

In our local support group for laryngectomised patients (The Yakity Yak Club), attendance rates were noted to vary, with very poor attendance in winter. Patients seemed to avoid social interaction during this time of year, for a variety of reasons, including excessive mucus production, episodes of tracheitis, coughing etc. This led to concerns among the support workers that patients' QOL may be worse in winter.

To date, longitudinal studies have focused mainly on head and neck cancer patients, with small subgroups of total laryngectomy patients.^{17–19} Recent prospective studies utilising validated instruments have been valuable in highlighting patients' short and medium term outcomes,^{20–22} suggesting that their QOL stabilises after six months. However, so

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far, such studies have not addressed long term survivors, given the fact that validated QOL questionnaires have only been developed in the past decade. For instance, the head and neck module of the European Organization for Research and Treatment of Cancer QLQ-C30 Questionnaire (EORTC QLQ-C30) was only validated in 1999.

This study aimed to elucidate further the long term effects for patients treated with total laryngectomy, by studying the QOL of those who had survived more than six months. Specifically, the study aimed to assess whether QOL was affected by seasonal change, in order to facilitate a more focused approach by support workers.

Materials and methods

Subjects

All surviving, recurrence-free patients who had undergone total laryngectomy at our institution were eligible for inclusion. Patients' characteristics are described in Table I. No demographic information could be found for five cases, and these were excluded from subgroup analysis. The exclusion criterion was less than six months' time elapsed since laryngectomy. This was necessary, as previous studies have demonstrated a fluctuant QOL up to six months post-laryngectomy.

All eligible patients were invited to participate. Three patients had to be excluded as they were not resident at their last known addresses.

TABLE I
PATIENT CHARACTERISTICS

Parameter	<i>n</i>	%
Male:female ratio	6:1	
<i>Time since surgery</i>		
6 mths to 2 yrs	5	15
2–5 yrs	11	33
>5 yrs	17	52
<i>Average age</i>		
At surgery	60 yrs	
At present	65 yrs	
<i>Initial T stage</i> *†		
T ₁	7	21
T ₂	10	30
T ₃	5	15
T ₄	11	33
<i>Neck dissection?</i>		
Yes	8	24
No	25	76
<i>Radiotherapy</i> ‡		
Single modality	17	52
Adjuvant	9	27
None	7	21
<i>Site</i>		
Supraglottis	4	12
Glottis	17	52
Subglottis	2	6
Hypopharynx	4	12
Other	6	18

*At first diagnosis; †T₁ and T₂ that later needed salvage total laryngectomy.

‡Single modality – total laryngectomy performed as salvage. Mths = months; yrs = years; T = tumour

Assessment instrument

The EORTC QLQ-C30 version three, with head and neck module, was used with permission for the purposes of this study. This validated questionnaire was developed for the assessment of cancer patients' QOL, and has been shown to be both sensitive and accurate over time. Statistical analysis was performed using the Statistical Package for the Social Sciences software (SPSS Inc, Chicago, Illinois, USA), with an add-on module provided by the European Organization for Research and Treatment of Cancer.

Method

Patients were invited to attend an interview with the investigators. The questionnaire was included in the invitation, and those who were unable to attend were asked to complete the questionnaire and to return it by post. A structured interview was conducted; the questionnaire was discussed with the patient and any unanswered questions were addressed, and details of the patient's clinical history were then obtained. This structure attempted to minimise interviewer bias. Following the interviews, a retrospective case note review was undertaken to determine other possible confounding factors, such as: age, sex, tumour stage on first diagnosis, salvage surgery, post-operative radiotherapy and other operations (such as neck dissections). The method for the second and third round of assessment comprised postal return of the questionnaire.

Power and sample size calculations were performed. In order to attain 80 per cent power to detect a 30 per cent difference with $p = 0.05$, a sample size of 36 in each group would have been needed.

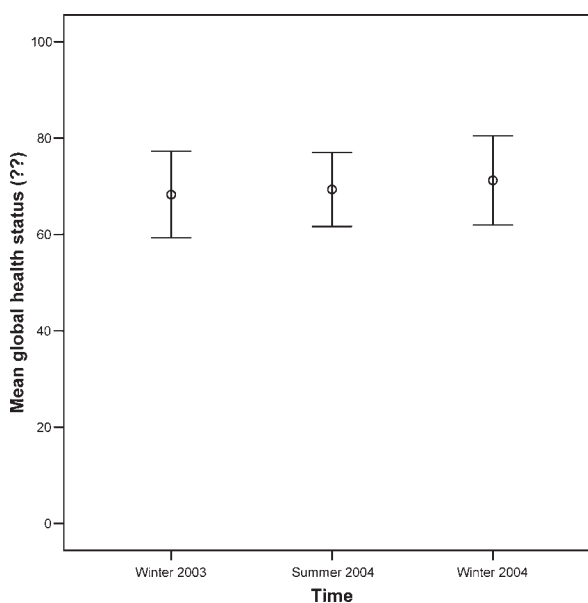


FIG. 1

Mean global health status (for quality of life), with 95 per cent confidence intervals.

TABLE II
GENERIC OUTCOMES

Activity or condition	Patients experiencing some difficulty (%)		
	Winter 2003*	Summer 2004 [†]	Winter 2004 [‡]
Long walk	42.3	40.0	39.1
Strenuous activities	37.0	28.0	39.1
Short of breath	32.1	24.0	34.8
Financial concerns	32.0	24.0	19.0
Depressed	30.8	8.3	22.7
Tired	26.9	12.0	22.7
Sleeping	25.0	32.0	30.4
Social activities	24.0	24.0	27.3
Irritable	23.1	12.5	10.0
Need to rest	21.4	16.0	26.1

**n* = 28; [†]*n* = 25; [‡]*n* = 23.

Results

An overall average response rate of 70.3 per cent (76/108) was achieved. The response from the January 2004 round was 77 per cent (28/36), that from the August 2004 round was 69 per cent (25/36) and that from the January 2005 round was 63 per cent (23/36). One patient died during the study, and one developed coexistent disease that necessitated exclusion.

A total of 76 questionnaires were analysed, utilising the SPSS software, supplemented with an additional software module facilitating spreadsheet analysis of questionnaire results, supplied by the European Organization for Research and Treatment of Cancer.

This analysis generated an output for the various parameters. Overall, the results were remarkably consistent. A few parameters are discussed below.

Patients' global health status was analysed. The individual line plots and the correlations indicated that patients' global health status was fairly consistent over time (apart from one patient whose global health status dropped dramatically) (Figure 1).

Patients' time elapsed since surgery (categorised as: six months to two years; two to five years; or more than five years) showed no statistically significant difference, using repeated measures analysis of variance ($F = 0.171$; $p = 0.843$).

No statistically significant seasonal variation was found when analysing for variables such as tumour stage at diagnosis, neck dissection and radiotherapy use.

Regarding patients' emotional function, repeated measures analysis of variance showed no statistically significant seasonal variation ($F = 1.343$; $p = 0.274$). No statistically significant difference was found when analysing sex, tumour stage at diagnosis, neck dissection or radiotherapy.

Regarding generic (i.e. not disease-specific) QOL issues, the majority of patients reported no or 'only a little' trouble with all activities and conditions. The activities and conditions for which patients were more likely to experience at least 'quite a bit' of difficulty are shown in Table II and Figure 2. Such activities and conditions, ordered from those most likely to those least likely to produce difficulty, were: taking a long walk, doing strenuous activities, shortness of breath, financial concerns, depression,

tiredness, sleeping problems, social activities, irritability and the need to rest.

Noticeably smaller percentages of patients experienced depression, tiredness, trouble with strenuous activities, shortness of breath, or need to rest in the summer.

Results for disease-specific QOL issues are shown in Table III and Figure 3. Problems with sense of smell, less interest in sex, trouble talking to others directly and over the telephone, and coughing were among the most common problems.

Of the most prevalent symptoms, coughing was the only one which appeared to improve during the summer.

Discussion

In summer, fewer subjects reported depression, tiredness, trouble with strenuous activities, shortness of breath, need to rest and coughing. However, no statistically significant difference could be found. In addition, patients' global health scores remained unchanged between summer and winter. This was rather unexpected, as the attendance rate at the local support group had been noted to dwindle during winter.

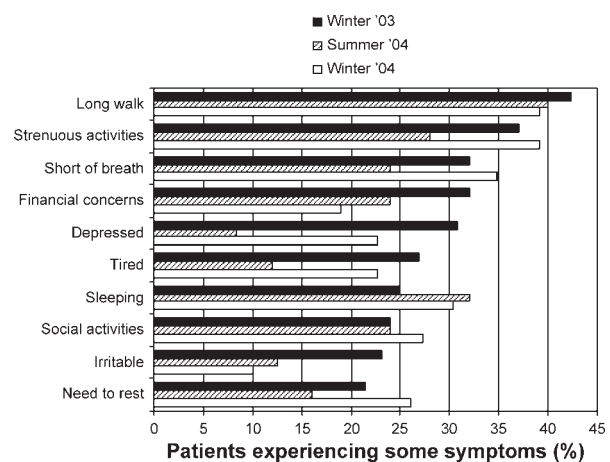


FIG. 2

Generic outcomes: combined results.

TABLE III
HEAD AND NECK OUTCOMES

Symptom or problem	Patients experiencing some symptoms (%)		
	Winter 2003*	Summer 2004†	Winter 2004‡
Problems with sense of smell	92.6	92.0	87.0
Less interest in sex	75.0	81.0	76.2
Trouble talking to other people	73.1	72.0	69.6
Trouble talking on telephone	71.4	80.0	73.9
Cough	66.7	64.0	73.9
Problems with sense of taste	63.0	80.0	52.2
Sticky saliva	57.7	60.0	60.9
Felt less sexual enjoyment	57.7	78.9	75.0
Bothered by appearance	51.9	56.0	50.0

**n* = 28; †*n* = 25; ‡*n* = 23.

As can be deduced from the above-mentioned power and sample calculations, there is a risk of a type II error. As stated before, sample size calculations suggested the need for groups of 36 patients each in order to reach 80 per cent power to detect a difference of 30 per cent. This was attained, but a larger number would have been more robust.

However, the EORTC QLQ-C30 was designed to cater for large, multicentre trials. As such, it had a large number of output parameters (17 just for the head and neck section), as part of a standardised analysis. In smaller studies such as the present one, an analytical tool providing only a few parameters would be more suitable for statistical comparison between groups. As such, the authors encourage the European Organization for Research and Treatment of Cancer to consider developing an analysis and interpretation method that caters for smaller studies. The present situation makes useful analysis very difficult; it can be seen that the usefulness of EORTC QLQ-C30 in smaller studies is limited. An attempt at grouping some parameters together failed due to use of different scales. As most patient responses were 'not at all', we preferred to analyse those responses reporting problems, and found this to be more sensible.

The lack of a control group was a weakness of the study. Only a prospective design would have

provided a pre-treatment baseline QOL measurement; ideally, a pre-disease QOL measurement should have been used as a baseline, but this was clearly unfeasible. This study was initially begun as an audit; given the small number of post-laryngectomy patients available for study, the authors felt at the time that the current design was the best compromise. Admittedly, a normal control group would have added useful data.

- Several studies have shown that post-laryngectomy quality of life (QOL) stabilises after six months
- This study could not find a statistically significant difference between winter and summer QOL scores for post-laryngectomy patients
- This suggests that seasonal changes do not influence the QOL of post-laryngectomy patients
- Further developments of QOL analysis instruments are needed in order to facilitate smaller QOL studies

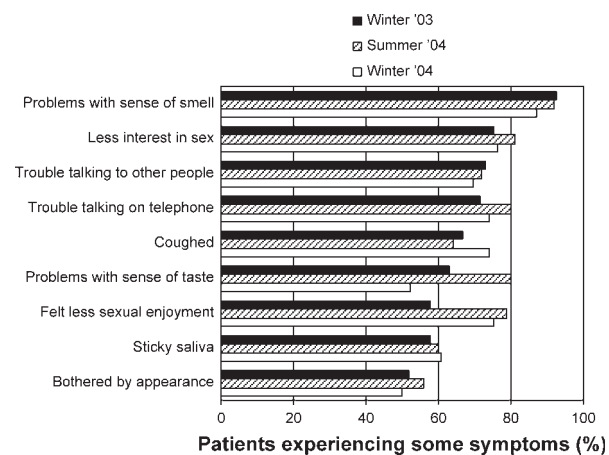


FIG. 3

Head and neck outcomes: combined results.

Our data compare favourably with previous studies, regarding stabilisation of QOL after six months; our groups remained at a similar level of QOL throughout. Global health status remained consistent, apart from one patient who had coexistent disease. It remains to be seen whether QOL questionnaires can be used as part of an audit process in order to proactively identify individuals in need of further support.

Conclusions

There appeared to be no statistically significant difference between summer and winter QOL scores in post-laryngectomy patients. This could suggest that QOL stabilises over time and is not significantly influenced by seasonal change. Further development of QOL analysis instruments is needed in order to facilitate smaller studies.

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