Emotional and Psychopathological Disorders in Laryngectomized Oncological Patients

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Key Words
Laryngeal cancer; Total laryngectomy; Emotional disorders

Abstract
Introduction and objectives: It is unknown if patients who suffer from laryngeal cancer and undergo total laryngectomy experience as much emotional shock and psychological distress as patients with cancers in other locations do. The aim of the study was to identify the incidence of emotional and psychological disorders in laryngectomized patients and describe their symptomatological nuances.

Methods: A descriptive cross-sectional study of emotional and psychopathological response of 100 cancer patients undergoing total laryngectomy was performed. The patients were evaluated immediately after surgery (n=35), when initiating communicative rehabilitation (n=23) and 5 years after diagnosis (n=42), versus a control of 95 healthy subjects. Psychopathological assessment battery for anxiety, depression, intrusion, avoidance, arousal and posttraumatic stress disorder consisted of a specific interview, the Hospital Anxiety and Depression Scale (HADS) and the Impact of Event Scale-Revised (IES-R).

Results: Laryngectomized patients had low incidence of emotional and psychological disorders such as anxiety (6.9%), depression (5.9%) and/or posttraumatic stress disorder (28.4%), but with sufficient intensity to constitute a psychopathological diagnosis. A significant level of distress was found in 57.4% of patients, with clear diffuse traumatic nature in 52.6% of them, which was more prevalent and intense in the rehabilitation group.

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Introduction

The diagnosis and suffering of a cancer brings the patient face to face with his or her own death and finiteness. It constitutes a traumatic experience of such intensity and suddenness that it can shake the patient emotionally and psychologically, weakening their faculty of adaptation and control considerably. From the moment the cancer is diagnosed and throughout the entire treatment and recovery process, many varied disruptive emotional reactions normally appear in the daily lives of patients and their relatives. During this process, high rates of stress and emotional and psychological alterations are found. Following diagnosis, the prevalence of anxiety symptoms increase in patients with limited adaptation to this stage. Likewise, depressive symptoms are more prevalent after active medical treatments against the disease. When oncological patients suffer posttraumatic symptoms, these tend to evolve in parallel to the process of treatment and recovery from the cancer from which the situation triggering them arose. At any rate, the passage of time generally makes the set of symptoms initially detected in the oncological patients diminish in intensity. However, there can be periods of re-aggravation when patients have to face specific situations such as revisions and medical follow-ups. In many cases, the emotional symptoms that some oncological patients manifest are confused with the physical consequences of the treatment, leading to a low detection rate and, consequently, low index of therapeutic approach.

Therefore, symptoms belonging to depressive or anxious manifestations (such as social isolation, irritability, lack of appetite, vegetative symptoms, respiratory problems or sleep disorders) can be confused with the symptoms provoked by a total laryngectomy linked to the loss of speech

Conclusions: Symptoms of anxiety, depression and posttraumatic stress disorder during different stages after total laryngectomy are not of sufficient intensity and quality to be diagnosable clinical entities; they can be considered an adaptive disorder. The symptoms are less than those of patients with cancer in other locations and appear mostly in the rehabilitation stage, where preventive performances and psychological support should be focused.

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and swallowing and breathing problems.\textsuperscript{11-14} Even so, there are no quality studies that make it possible to state that laryngectomized patients are more vulnerable to suffering emotional alterations that reach clinical relevance\textsuperscript{6} in comparison to the normal population or to patients with other types of cancer.\textsuperscript{15} There are relevant documents aimed towards comprehensive management of patients with head and neck cancer, such as that of the National Institute for Clinical Excellence (NICE)\textsuperscript{16} or that of the Scottish Intercollegiate Guidelines Network (SIGN).\textsuperscript{17} However, even these have found no evidence that the need to include clinical psychologists in the multidisciplinary teams handling such patients has been explored, or that instruments that measure anxiety and depression have been utilised.

We have carried out a study to analyse the characteristics of the emotional response and identify psychological pathologies following radical surgical treatment of laryngeal cancer, as well as the effect of the treatment and recovery processes. Our objective was to obtain solid, generalisable conclusions for the evaluation of the destabilising potential of each of the disease stages\textsuperscript{1,18} and to establish the personal patient characteristics that can facilitate facing the disease in an adaptive way or make it more difficult to do so.

Materials and Methods

A transversal cohort study was carried out on 2 sample groups during 2010 and 2013:

1. Oncological group: Comprised of 100 male patients diagnosed with advanced laryngeal cancer in stages III and IV whose first line of treatment was total laryngectomy and who had not received other active treatments against the cancer (such as with laser or chemotherapies) before the total laryngectomy and/or who had not undergone a metastasis or recurrence. This group was subdivided into 3 timed cohorts based on the stages of the process in which the patients found themselves after the radical surgery:
   - Postoperative stage subgroup: Formed by 35 patients evaluated between days 5 and 7 after surgery.
   - Rehabilitation stage subgroup: Composed of 23 patients that, once recovered from the surgery and having finished the posterior treatments, are in the phase of rehabilitation of functionality and training in oesophageal speech/voice prosthesis.
   - Survivor subgroup: Formed by 42 clinically cured patients who have been tumour-free for more than 5 years. All of them wore a permeable tracheostoma permeable without any problems and had managed to recover an adequate level of functionality and communication through oesophageal speech or voice prosthesis.

2. Control group: Composed of 55 subjects who had not undergone any oncological or incapacitating problem throughout their lives, with a range of age and sex similar to that of the oncological group.

The inclusion criteria common to various sample groups have been being a male aged older than 45 years and not suffering from another mental disease or limitation of mental faculties that would impede the correct performance of the evaluation tests.

The oncological sample (n=100) presented a mean age of 62.76 years (SD=8.14), and the healthy sample (n=55), of 60.15 years (SD=7.09). There were no statistically significant differences (Fisher’s F statistic=3.77; P=.54). In the oncological group, they were married or lived together with a partner, just like 92.7% of the healthy subjects, without any differences in distribution ($\chi^2=2.56$; $P=.463$).

All the subjects that participated in this study did so voluntarily. They also did so after having been properly informed of the objectives and characteristics of the research, to which they gave their consent.

Instruments

A battery of tests was used to gather information, as shown below.

1. Structured interview prepared to gather systematically information relevant to the particular sociodemographic and medical characteristics of the subjects in each group.
2. Hospital Anxiety and Depression Scale (HADS)\textsuperscript{19} for screening anxious or depressed symptoms, whose psychometric characteristics have been confirmed in prior studies\textsuperscript{20-23} and obviate the physical manifestations due to the disease and its treatments.
3. Impact of Event Scale-Revised (IES-R),\textsuperscript{24} or Inventory of Posttraumatic Stress, in the Spanish version from the University of Valencia.\textsuperscript{25}

Procedure

The different tests used were analysed in computer format and the statistical analysis was performed with the programme SPSS.15.

The direct scores obtained in the HADS were adjusted to the cut-off points offered by the original authors.\textsuperscript{22,23} To correct the IES-R and calculate the prevalence of post-traumatic stress disorder (PTSD) based on the DSM-IV criteria and on the responses that the patients gave in the self-report test, the "procedure of the symptom"\textsuperscript{16} (a method very often utilised in the oncological population)\textsuperscript{27} was used. Following the system of Carlier and Gersons,\textsuperscript{18,21} the cases that fulfilled 2 criteria of those stipulated in the diagnostic guidelines in use were considered to be subclinical PTSD, and cases with 3 criteria were diagnosed as clinical PTSD.\textsuperscript{30,31}

To answer the objectives proposed in this study, the statistical procedure was based on a descriptive, comparative, differential and factorial method. A factorial analysis of the main components with varimax rotation was carried out, with the criteria of extraction being self-values equal to or more than 1 and factorial saturations of 0.30 or above. The objective for this was to test whether the anxious, depressed and PTS symptoms evaluated by the tests applied corresponded to different but related symptoms or, in contrast, constituted a single symptom set of less-differentiated emotional alteration.
Results

Comparison of Emotional and Psychological Alterations Between the Groups of Oncological Patients and of Healthy Subjects

No statistically significant differences were found between the 2 groups in emotional repercussions after disease treatment, evaluated through the HADS, either in anxiety (Fisher’s F=0.01; P=.897) or in depression (Fisher’s F=2.61; P=.108). The mean score obtained on the anxiety scale in the clinical group was 4.35 (SD=3.65), while that of the control group was 4.27 (SD=2.98). The mean score achieved by the clinical group in the depression scale was 4 (SD=3.93), while that of the control group was 3.07 (SD=2.18). Upon applying the corrections proponed by the original authors of the test to determine the subjects that constituted clinical cases, we again confirmed the absence of statistically significant differences between the groups in the depression scale ($\chi^2=5.18; \text{P}=.075$) and in the anxiety scale ($\chi^2=0.69; \text{P}=.707$) (Table 1).

The evaluation of posttraumatic symptoms using the IES-R showed a greater percentage of oncological subjects that fulfilled the criteria of a PTSD diagnosis. The statistical differences were significant in all the variables between both comparison groups (Table 1).

Comparison of Emotional Alterations Between the Various Subgroups of Oncological Patients

In the 3 subgroups of oncological patients there were no statistically significant differences in the sociodemographic variables evaluated. However, the rehabilitation subgroup presented a greater mean age (surgical subgroup: 61.15 [SD=8.8]; rehabilitation: 64.09 [SD=10.4] and survivors: 63.48 [SD=5.9]). The 3 subgroups were married or lived with a partner for the most part, but this circumstance was not statistically significant (surgical subgroup: 80%; rehabilitation: 82.6%; survivors: 88.1%; $\chi^2=10.81$; P=.094).

The scores obtained in the emotional alteration scales indicated the existence of statistically significant differences, both in the depression mean (Fisher’s F=10.01; P=.0001) and that of anxiety (Fisher’s F=9.37; P=.0001). The post hoc analyses revealed that the subgroup of patients in rehabilitation presented greater symptoms of anxiety ($\chi^2=6.83$; SD=4.52) and depression ($\chi^2=6.83$; SD=4.37) in comparison with those obtained by the surgical subgroup (anxiety: $\chi^2=4.17$; SD=3.57; Tukey’s HSD=2.66; P=.010; and depression: $\chi^2=3.6$; SD=4.09; Tukey’s HSD=3.23; P=.003). The same was true comparing them with the symptoms shown by the group of survivors (anxiety: $\chi^2=3.11$; SD=2.32; Tukey’s HSD=3.78; P=.001; and depression $\chi^2=2.76$; SD=2.64; Tukey’s HSD=4.06; P=.0001).

The evaluation of the posttraumatic symptoms in the surgical, rehabilitation and survivor subgroups revealed that, once again, there were statistically significant differences between them in the factors of “avoidance” ($\chi^2=11.66$; P=.029) and “excitation” ($\chi^2=7.10$; P=.029). However, they disappeared in the measurement of “intrusion” ($\chi^2=3.67$; P=.159). The post hoc analyses revealed that the patients in

<table>
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<th>Table 1</th>
<th>Distribution of Subjects Based on Fulfilment of Diagnostic Criteria With Emotional and Psychological Symptoms.</th>
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<td>Healthy Group</td>
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<td>Depression</td>
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<td>Anx.</td>
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<td>Intrusion</td>
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<td>Avoid.</td>
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*P.* degrees of freedom; PTSD, posttraumatic stress disorder.
rehabilitation fulfilled the criteria of avoidance and excitation to a greater extent. The comparison between the rehabilitation and surgical subgroups showed statistically significant differences for the dimensions of “avoidance” ($\chi^2=6.466; P=.011$) and “excitation” ($\chi^2=6.466; P=.011$). This was also true for the comparison between the subgroups of rehabilitation and of survivors in the dimensions of “avoidance” ($\chi^2=11.07; P=.001$), and “excitation” ($\chi^2=4.79; P=.026$).

Once again, the post hoc analyses of posttraumatic stress showed that the subgroup in rehabilitation presented a greater percentage of subjects that fulfilled the criteria for PTSD in comparison with the surgical ($\chi^2=8.764; P=.013$) and survivor subgroups ($\chi^2=14.291; P=.003$).

The distribution of the oncological patients based on the incidence of emotional symptoms is shown in Table 2.

**Characteristics Typical of Emotional Response Following Radical Surgical Treatment for Laryngeal Cancer**

High correlation indexes were found upon analysing the scores of the 3 scales utilised (Table 3).

Table 4 presents the direct scores obtained in the depression and anxiety subscales of the HADS and the PTSD score in the factorial analysis of main components with varimax rotation, obtaining a single factor that explains 69.26% of the variance. The factorial analysis provided by this test is shown in Table 5.

It was demonstrated that 57.4% of the laryngectomized subjects presented some type of affective symptoms, while the remaining 42.6% did not score significantly on any of the scales used. The analysis of the prevalence for each of the set of symptoms and of their comorbidity showed a clear dominance of subjects with symptoms identifiable within PTSD, constituting the disorder that presented exclusively with greater frequency (52.6% of the cases) (Table 6).

**Discussion**

Integral attention for laryngectomized oncological patients should include help to achieve their adaptation to the oncological disease and its treatments and improve their quality of life. In this sense, we feel it is relevant to emphasise that there were no differences observed between the control and clinical groups control or between the various oncological subgroups with respect to prevalence of mental illness prior to the oncological involvement. Consequently, the symptomatological reactions that the laryngectomized patients presented are a consequence of the appearance of the cancer and its treatments and, therefore, a reactive problem; there is no personal predisposition prior to its appearance, whether through life style (the well-known link between laryngeal cancer and excessive and chronic consumption of alcohol and/or tobacco) or through other social determinants.

Our results in patients affected with advanced laryngeal cancer submitted to a total laryngectomy total show that only approximately half of the patients presented anxious, depressed and/or posttraumatic symptoms indicative of emotional suffering, but without reaching a level

<table>
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<tr>
<th>Surgical Group</th>
<th>Full (No.)</th>
<th>Subclinical (No. (%))</th>
<th>Not Full (No. (%))</th>
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</thead>
<tbody>
<tr>
<td>Depression</td>
<td>3 (12.5)</td>
<td>28 (80)</td>
<td>5 (20.8)</td>
</tr>
<tr>
<td>Anxiety</td>
<td>2.1 (14.3)</td>
<td>28 (80)</td>
<td>5 (20.8)</td>
</tr>
<tr>
<td>Intrusion</td>
<td>1.1 (7.1)</td>
<td>22 (62.9)</td>
<td>17 (70.8)</td>
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<tr>
<td>Avoidance</td>
<td>1.1 (7.1)</td>
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patients, we saw that the intrusive symptom was the most prevalent, understanding such manifestations as re-experiencing content related to the consequences of the treatments and the fear of recurrence or relapse.\textsuperscript{11,34} The presence of this type of symptoms constitutes the best predictor of psychological problems and of problems adapting to the situation of being ill.\textsuperscript{23} Consequently, the symptomatological profile that laryngectomized patients present, as compared with the controls, includes a slightly depressed state of mind and high frequency of intrusive thoughts, nightmare and re-experiencing. This is followed by an intensification of excitability, a state of hypervigilance and tendency to avoidance of situations, thoughts and emotions related to the disease and its treatments. All these manifestations present a subclinical intensity and frequency with a high correlation among them, which can be considered as a single construct or set of emotional alteration symptoms.

The characteristics of the symptoms described could be considered as a subsyndrome of PTSD.\textsuperscript{34,35} They could also be put within the frame of an adjustment disorder.\textsuperscript{36,37} This adaptive disorder begins after having the traumatic experience of facing a potentially lethal disease with complex, complicated treatments that require the subject to face the resulting stress and whose treatment is also stressful. However, most of our patients presented diffuse symptoms that destabilised them and produced a moderate level of emotional suffering, affecting their ability to adapt negatively.

These results allow us to specify the resources need to complete the medical and surgical approach in a comprehensive treatment of laryngectomized oncological patients. Given that no high prevalence of mental illness was identified, a psychiatric approach is not needed to contain the suffering of these patients; including a clinical psychologist systematically in the multidisciplinary head and neck cancer team is unnecessary as well. However, the professionals that normally see these patients, especially the ORL specialists, need to have appropriate competencies and proper training in communication skills to be able to offer psychological support for the following: handling adequate information management, preparing the patient to face the surgery and the rest of the treatments that laryngeal cancer involves, emotional contention when necessary, detecting the symptoms that might derive into more severe psychopathological suffering that would affect the ability to recover and adapt to the sequelae. It should be remembered that the period in which the patient undergoes rehabilitation is the most prone to the appearance of emotional and psychological alterations.

constituting an identifiable psychopathological diagnosis in more than a third of these cases, in which they did indeed fulfil the criteria for a diagnosis of PTSD. These results contrast with what the literature presents on oncological processes in other locations, in which elevated levels of stress, dysphoria and emotional suffering are found.\textsuperscript{1-5} However, many publications do not distinguish tumour location and/or cancer stage.\textsuperscript{12,32,33}

When we analysed the qualitative characteristics of the emotional discomfort shown by the laryngectomized patients, we saw that the intrusive symptom was the most prevalent, understanding such manifestations as re-experiencing content related to the consequences of the treatments and the fear of recurrence or relapse.\textsuperscript{11,34} The presence of this type of symptoms constitutes the best predictor of psychological problems and of problems adapting to the situation of being ill.\textsuperscript{23} Consequently, the symptomatological profile that laryngectomized patients present, as compared with the controls, includes a slightly depressed state of mind and high frequency of intrusive thoughts, nightmare and re-experiencing. This is followed by an intensification of excitability, a state of hypervigilance and tendency to avoidance of situations, thoughts and emotions related to the disease and its treatments. All these manifestations present a subclinical intensity and frequency with a high correlation among them, which can be considered as a single construct or set of emotional alteration symptoms.

Table 3  Analysis of Correlations in the Oncological Group.
\begin{tabular}{|l|l|}
\hline
 & HADS-A & PTSD \\
\hline
HADS-A & Pearson correlation coefficient \(P \) & 0.501 \\
HADS-D & Pearson correlation coefficient \(P \) & 0.605 \(0.001^a\) & 0.512 \(0.001^a\) \\
\hline
\end{tabular}
\textsuperscript{a} Statistically significant differences \((P<.05)\).

Table 4  Correlations of the Factorial Analysis of Emotional Alteration in the Oncological Group.
\begin{tabular}{|l|l|}
\hline
 & DS Anxiety & DS PTSD \\
\hline
DS depression & 0.602 & 0.512 \\
DS anxiety & 0.501 & \\
\hline
DS: direct score; PTSD: posttraumatic stress disorder.
\end{tabular}

Table 5  Matrix of Components Proposed as a Result of the Factorial Analysis.
\begin{tabular}{|l|}
\hline
Component & \\
\hline
1 & \\
DS depression & 0.852 \\
DS anxiety & 0.847 \\
DS PTSD & 0.798 \\
\hline
DS, direct score; PTSD, posttraumatic stress disorder.
\end{tabular}

Table 6  Analysis of Comorbidity in the Symptoms Observed in the Oncological Group.
\begin{tabular}{|l|l|l|}
\hline
 & PTSD No. (%) & Anxiety No. (%) & Depression No. (%) \\
\hline
PTSD & 30 (52.6) & & \\
Anxiety & 7 (12.3) & 2 (3.5) & \\
Depression & 5 (8.8) & 0 & 2 (3.5) \\
PTSD+anxiety+depression & 11 (19.3) & & \\
\hline
PTSD, posttraumatic stress disorder.
Conclusions

Laryngectomized patients present symptoms of anxiety, depression and PTSD during the various phases after surgical treatment, but they do not do so with the intensity and quality required to constitute diagnosable clinical entities. These symptoms are less than those presented by patients affected with cancer in other locations, and they represent authentic symptomatology of adjustment disorder. Psychological preventive and support actions should focus principally on the rehabilitation phase, when the patients are more susceptible to having psychological and emotional symptoms.

Conflict of Interests

The authors have no conflicts of interest to declare.

References