Retrospective comparison of cognitive behavioral therapy and symptom-specific medication to treat anxiety and depression in throat cancer patients after laryngectomy

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**Background:** Laryngectomy, a common treatment for laryngeal cancer, is a disabling operation that can induce tremendous stress, but little is known about how to alleviate the psychological effects of the operation.

**Aim:** Compare the effectiveness of cognitive behavioral therapy (CBT) and medication in treating anxiety and depression among throat cancer patients after laryngectomy.

**Methods:** Review of medical records of the psychological outpatient clinic in the Third People’s Hospital of Huzhou City between March 2009 and May 2013 identified 63 patients with post-laryngectomy depression or anxiety disorders who received 8 weeks of one-on-one treatment with CBT (in which patients responded in writing because they were unable to speak) and 56 patients who received 8 weeks of treatment with buspirone (n=11), sertraline (n=9) or both buspirone and sertraline (n=36). The treatment provided (CBT or medications) was based on the stated preference of the patient. The Zung Self-rating Anxiety Scale (SAS) and the Zung Self-rating Depression Scale (SDS) were administered before and after treatment.

**Results:** After 8 weeks of treatment the mean SAS and SDS scores had decreased significantly in both groups and the prevalence of clinically significant anxiety and depression (based on SAS and SDS cutoff scores) had dropped dramatically. There were, however, no significant differences between the two treatment methods. In the medication group 32% of participants experienced one or more adverse reactions during treatment, but none of these were severe enough to require withdrawal from treatment.

**Conclusions:** CBT is an effective, short-term treatment for reducing the anxiety and depressive symptoms that often occur after an individual is diagnosed with cancer or treated for cancer. There is robust evidence that treatment of these psychological symptoms can improve both the quality of life and course of illness in cancer patients, so oncologists and other clinicians need to regularly screen patients with cancer and other chronic life-threatening conditions for anxiety and depression and, if present, actively promote the treatment of these symptoms. This study shows that CBT can be effective for cancer patients even when they are unable to speak.

**Keywords:** cognitive behavior therapy, laryngectomy, depression, anxiety disorders

1. Introduction

Throat cancer is one of the most common types of cancers in the head and neck. A laryngectomy is the most effective treatment for patients with advanced throat cancer, but it is an invasive procedure that results in the loss of the ability to speak. Patients undergoing laryngectomy experience a variety of stresses including concerns about the cancer, long-lasting adverse effects of radiotherapy, loss of voice and financial problems. These stressors often lead to high levels of anxiety or depressive symptoms that can suppress the immune system and, thus, may accelerate progression of the cancer.¹ Cognitive behavioral therapy (CBT) is a type of psychological treatment that aims to change patients’
maladaptive thinking about stressors and, thus, positively influence affect and behavior.\(^2\) Theoretically, the use of motivational strategies, improvement of self-awareness and activation of social support networks encouraged by CBT can help cancer patients gain a sense of control over the illness and increase their confidence to fight the illness.\(^3\) CBT does not require that the patient be able to communicate orally, so some researchers have proposed the use of CBT to treat patients with throat cancer who develop clinically serious symptoms of anxiety or depression.\(^4\) Despite the plausibility of using CBT with patients who communicate with the therapist in writing, there has been no empirical evidence about the effectiveness of CBT in the treatment of anxiety and depression among patients who have undergone laryngectomy.

The current retrospective study reviewed and analyzed the medical charts of 119 patients with throat cancer who were diagnosed with anxiety disorders or depression after a laryngectomy.

2. Sample and methods

2.1 Sample

We reviewed medical charts of 155 patients who sought treatment at the psychological outpatient clinic in the Third People’s Hospital between March 2009 and May 2013 for anxiety disorders or depression (diagnosed according to criteria specified in the Third Edition of the Chinese Classification of Mental Disorders, CCMD-3\(^5\)) after a laryngectomy. As shown in Figure 1, after removing 36 cases due to various exclusion criteria, there were 119 who completed treatment for anxiety and depression, including 63 who received CBT without medication and 56 who received medication (buspirone, sertraline or both buspirone and sertraline) without CBT. The time lag between the laryngectomy and the beginning of psychological treatment varied from 0.5 to 6.5 months. Eighty-five of these patients (71%) were referred by the otolaryngology departments of the No. 1 Hospital of Huzhou or the Central Hospital of Huzhou; the remaining 34 patients were self-referred. The proportion of self-referred patients did not differ between patients who elected to use CBT and those who elected to use medication.

Among the 119 patients, 114 were males and 5 were females; 117 had squamous cell carcinoma and 2 had adenocarcinoma. They were 45 to 76 years of age; the mean (sd) age was 61.5 (7.8) years. None of the patients had a personal or family history of psychiatric disorders. No statistically significant differences were found between the CBT group and the medication group in mean age (62.6 [8.3] v. 60.4 [7.3]; \(t=1.50, p=0.136\)), gender (male 95.2% v. 96.4%; \(X^2=0.00, p=1.000\)), level of education (proportions of illiterate, primary school, high school and college graduates in the CBT group were 25.4%, 42.9%, 22.2% and 9.5%, respectively versus 25.0%, 35.8%, 28.6% and 10.7% in the medication group; Mann-Whitney \(Z=0.548, p=0.583\)), or income level (44.4% v. 50.0% had a monthly income of more than 6000 Renmibi [about $1000, $US]; \(X^2=0.37, p=0.544\)). The CBT and medication groups did not differ in the prevalence of neck lymph node metastasis (63.5% v. 60.7%; \(X^2=0.10, p=0.755\)), self-report of fear of cancer (84.1% v. 87.5%; \(X^2=0.27, p=0.600\)), or self-report of being introverted (69.8% v. 57.1%; \(X^2=2.07, p=0.150\)).

This study was approved by the institutional review board of the Third Hospital of Huzhou.

2.2 Methods

2.2.1 CBT

The physician who provided CBT to all the patients in the CBT group was a licensed psychiatrist and counselor. CBT was delivered one-on-one; each session was documented in the out-patient records. Patients communicated with the clinicians by writing...
their responses. There were a total of 12 sessions over a period of eight weeks (one or two 1.0- to 1.5-hour sessions per week). The content of the sessions focused on discussion of patients’ understanding of their experiences of cancer treatment and on their interpretation of the difficulties they were experiencing in their daily lives. Among the 64 patients who started CBT, 63 (98.4%) completed all 12 CBT sessions over the 8-week treatment period. None of these patients received antidepressant or anti-anxiety medications.

2.2.2 Medication

In the medication group, 56 of the 57 enrolled patients (98%) adhered with the medications over the entire 8-week treatment period. Among them, 11 patients with anxiety who did not have prominent depressive symptoms were administered buspirone (15 to 30 mg/d); 9 patients with depression who did not have prominent anxiety were administered sertraline (50 to 100 mg/d); and 36 patients with comorbid anxiety and depression were administered both buspirone (15 to 20 mg/d) and sertraline (50 to 100 mg/d). None of these patients received CBT or any other psychotherapeutic treatment.

2.2.3 Assessments

Before and after treatment patients completed the Zung Self-rating Anxiety Scale (SAS) and the Zung Self-rating Depression Scale (SDS).[6] SAS and SDS are commonly used assessment tools in China with good validity and reliability.[7-9] Each scale contains 20 items rated on a 4-level Likert scale (‘not at all or just a little of the time’, ‘some of the time’, ‘a good part of the time’, and ‘most of the time’). SAS has 15 positive items and 5 negative (i.e., reverse-scored) items; SDS has 10 positive items and 10 negative items. The standardized score is the total of the raw item scores (score 1 to 4 for each item) of the 20 items times 1.25, which results in a theoretical range of standardized scores of 25 to 100. The clinical threshold of SAS is 50; scores in the 50-59, 60-69, and 70-100 ranges correspond to mild, moderate and severe anxiety, respectively. For the SDS, the clinical threshold is 53; scores in the 53-62, 63-72 and 72-100 ranges correspond to mild, moderate, and severe depression, respectively.

2.2.4 Statistical analyses

SPSS 16.0 was used for analysis. One-sample (paired) t-test was used to compare the SAS and SDS scores before and after treatment for each group. Two-sample t-tests were used to compare cross-group differences. Chi-square tests were used to compare the proportions of patients with clinically significant anxiety or depression (i.e., those classified with mild, moderate or severe anxiety and depression based on SAS and SDS scores) between the two groups (standard two-group chi-square tests) and over time (McNemar Tests, matched one-group chi-square tests).

3. Results

As shown in Tables 1 and 2, there were significant reductions in the overall severity of anxiety and depressive symptoms in both treatment groups over the 8 weeks of treatment. This resulted in a substantial reduction in the proportion of patients who had clinically significant levels of anxiety or depression. There were, however, no statistically significant differences between the CBT group and medication group either before or after treatment.

In the CBT group 35 patients (55.6%) had comorbid depression and anxiety (i.e., SDS>53 and SAS>50) at the time of enrollment but only 2 patients (3.2%) had comorbid depression and anxiety after 8 weeks of treatment ($\chi^2=31.03, p<0.001$). In the medication group 36 patients (64.3%) had comorbid depression and anxiety at enrollment but only 3 (5.9%) had comorbid depression and anxiety after 8 weeks of treatment ($\chi^2=31.03, p<0.001$). There were no differences in the

| Group | Self-report Anxiety Scale (SAS) score | Self-report Depression Score (SDS) score |
|-------|-------------------------------------|----------------------------------------|
|       | Before treatment mean (sd) After treatment mean (sd) Difference mean (sd) Paired t-test p | Before treatment mean (sd) After treatment mean (sd) Difference mean (sd) Paired t-test p |
| CBT (n=63) | 54.4 (8.9) 42.7 (6.5) 11.7 (7.5) 12.44 <0.001 | 58.6 (11.6) 45.3 (6.2) 13.3 (9.4) 11.25 <0.001 |
| Medication (n=56) | 55.5 (8.5) 42.8 (7.0) 12.7 (8.0) 11.86 <0.001 | 59.2 (10.6) 45.9 (6.4) 13.3 (8.5) 11.68 <0.001 |
| t   | 0.65 0.10 0.64 | 0.27 0.51 0.03 |
| p   | 0.519 0.921 0.251 | 0.785 0.611 0.977 |
proportions of patients with comorbid depression and anxiety between the two groups at enrollment \(\chi^2=0.94, p=0.333\) or at the end of 8 weeks of treatment \(\chi^2=0.35, p=0.554\).

In the medication group 32% of the patients (18/56) had some adverse effect during the 8-week course of treatment: six had xerostomia, five had constipation, five had tremor, four had blurred vision, three had insomnia, one had both dizziness and headache, and one had nausea and vomiting. All of these symptoms were relieved after symptomatic treatment without requiring changes in the dosage or type of medication.

4. Discussion

4.1 Main findings

This study found that the SAS and SDS scores of post-laryngectomy patients who had distressing anxiety or depressive symptoms decreased significantly after 8 weeks of treatment with either CBT or symptom-specific medications and that the prevalence of anxiety disorder and depression (based on SAS and SDS cutoff scores) in the two treatment groups also dropped significantly. However, there was no statistically significant difference in the treatment efficacy of the two types of treatment.

The improvement with CBT conforms with the finding of a large meta-analysis that found CBT beneficial in the management of the anxiety and depression that frequently occur in cancer patients.10 Our failure to find a difference in the effectiveness of CBT and medication may be due to the different patient group or the different medications used in our study.

4.2 Limitations

This study is based on a retrospective analysis of clinical records, so assignment of patients to the two treatment conditions was not random, it was based on the stated preferences of the patients. We found no statistically significant differences in the characteristics of the patients in the two treatment groups but unobserved selection biases may have affected the results. CBT was provided by a single clinician and no formal assessment of the fidelity of the treatment provided was made. There was no ‘placebo’ control group so it is impossible to be certain that the dramatic improvement over time was the result of the treatments; though unlikely, the substantial improvement in depressive and anxiety symptoms could have simply been a ‘return to the mean’ after the psychological trauma of the laryngectomy. The stressors that cause anxiety and depression in cancer patients typically persist until their deaths, so studies with longer follow-up periods are needed to determine whether patients need ‘booster’ sessions of CBT or need to continue on their anti-anxiety and antidepressant medications to sustain the improvements seen in the current study over an 8-week treatment period.

4.3 Implications

An increasing number of general physicians and oncologists are realizing the importance of psychological wellbeing to the quality of life, recovery and long-term survival of cancer patients. There is a clear biological link between psychological stress and the immune system: high levels of anxiety and depression suppress the immune system, decrease the pain threshold and heighten the risk of progression, relapse, and metastasis of tumors. Comorbid anxiety and depression are
associated with an estimated 10 to 20% reduction in life expectancy of cancer patients. There is now convincing evidence that effective treatment for anxiety and depression can improve the quality of life and increase the life expectancy of cancer patients. Clinicians in all fields need to be more proactive in identifying anxiety and depressive symptoms in patients with life-threatening or chronic medical conditions; the effective treatment of these psychological symptoms can substantially improve the quality of life of these patients and slow the progression of their primary medical condition. Relatively simple screening measures such as the SAS and SDS could be used in a variety of clinical settings to identify individuals who would should receive a more detailed psychological evaluation and, possibly, treatment.

CBT is a relatively simple, short-term psychotherapeutic method that is acceptable to most patients. Based on the premise that cognitive activities play an important role in the occurrence and development of common psychological disorders, CBT corrects patients’ maladaptive cognitions, beliefs and behaviors and, thus, results in a gradual improvement in anxiety and depressive symptoms. CBT also has the advantage that it has few adverse reactions so it avoids the difficulties of giving psychoactive medications to elderly cancer patients who are often taking multiple other medications and are physiologically compromised. In most circumstances this should be the first-line treatment for cancer patients who are having clinically significant psychological symptoms related to the difficulties of adapting to their life-threatening illness. Our study shows that it is both acceptable and effective in patients who are unable to communicate orally but are otherwise aware and alert.

**Conflict of interest**
The authors declare no conflict of interest related to this study.

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