Depression Among Long-term Survivors of Head and Neck Cancer Treated With Radiation Therapy

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IMPORTANCE The diagnosis and subsequent treatment of head and neck cancer can have a potentially devastating impact on psychosocial functioning. Although the long-term physical adverse effects of radiation therapy (RT) for head and neck cancer have been well described, relatively few studies have evaluated psychosocial functioning after treatment.

OBJECTIVE To determine the prevalence of self-reported depression among survivors of head and neck cancer returning for follow-up after being treated with RT.

DESIGN, SETTING, AND PARTICIPANTS Cross-sectional analysis among 211 comprehensive cancer center patients with squamous cell carcinoma of the head and neck, who had been previously treated with RT and were disease-free with at least 1 year of follow-up. Patients with a history of mood disorder, use of mental health services in the past, or previous or current use of antidepressants or anxiolytics, excluding sleep medications, were specifically excluded.

INTERVENTIONS The University of Washington Quality of Life instrument (UW-QOL), a brief, previously validated, self-administered questionnaire, was used to analyze rates of depression.

MAIN OUTCOMES AND MEASURES The UW-QOL assigned scores of 0, 25, 50, 75, and 100 subjective responses of mood being “extremely depressed,” “somewhat depressed,” “neither in a good mood or depressed,” “generally good,” and “excellent,” respectively.

RESULTS The mean mood score did not differ at 1, 3, and 5 years after treatment, with scores of 52.0, 55.7, and 62.1, respectively. The proportion of patients who reported their mood as “somewhat depressed” or “extremely depressed” was 17%, 15%, and 13% at 1, 3, and 5 years, respectively. Variables that were significantly associated with post-RT depression included the presence of tracheostomy tube or laryngeal stoma (P = .01), gastrostomy tube dependence (P = .01), and continued smoking at the time of follow-up (P < .001). Among the patients reporting their mood as either “somewhat depressed” or “extremely depressed” at 1, 3, and 5 years, the proportion using antidepressants at the time was 6%, 11%, and 0%, respectively. The corresponding proportion of patients actively undergoing or seeking psychotherapy and/or counseling was 3%, 6%, and 0%, respectively.

CONCLUSIONS AND RELEVANCE Despite a relatively high rate of depression among patients with head and neck cancer in the post-RT setting, mental health services are severely underutilized.
The diagnosis and subsequent treatment of head and neck cancer can have a potentially devastating impact on psychosocial functioning. An analysis of the Surveillance, Epidemiology, and End Results (SEER) program observed that the suicide rate was more than 4 times greater among patients with head and neck cancer compared with that of the general population. Although causative factors were not specifically analyzed, it has long been hypothesized that patients with head and neck cancer, many of whom have a history of tobacco and alcohol abuse, experience disproportionate emotional distress due to the possibility of physical disfigurement from disease progression and/or treatment, as well as distress due to impairment of such basic human functions as eating, speaking, and breathing.

Although the long-term physical adverse effects of radiation therapy (RT) for head and neck cancer have been well described, relatively few studies have evaluated psychosocial functioning, including depression, among patients treated in this setting. This is of particular relevance because depression not only adversely affects quality of life but is also treatable. The purposes of this study were to perform a cross-sectional analysis of depression among long-term survivors of head and neck cancer who were previously treated with RT and to identify potential risk factors.

Methods

Patient and Treatment Characteristics
This study was approved by all relevant institutional review boards. The University of Washington Quality of Life instrument (UW-QOL) is a brief, previously validated, self-administered questionnaire that patients returning for follow-up after completion of RT for head and neck cancer have routinely completed at our institution since 2007. The UW-QOL scores were retrospectively reviewed for 211 patients with squamous cell carcinoma of the head and neck who had at least 1 year of follow-up and were disease-free. Patients with a history of mood or psychiatric disorder, use of mental health services in the past, or previous or current use of antidepressants or anxiolytics, excluding sleep medications, were specifically excluded from this analysis.

Patients had a Karnofsky Performance Status score of at least 70 at the time of initial treatment. Of the 211 patients, 122 (58%) were male and 89 (42%) were female (median [range] age, 57 [21-93] years), and 116 (55%) were treated by definitive RT and 95 (45%) were treated postoperatively. Concurrent chemotherapy was administered with RT for 89 patients (42%). Patient and disease characteristics are listed in Table 1.

Description of Screening Instruments
The UW-QOL (version 4) was administered at each follow-up visit and was completed by the patient with the assistance of nursing and/or physician staff. The UW-QOL consists of 12 domains pertaining to the degree of quality of life in the categories of pain, appearance, activity, recreation, swallowing, chewing, speech, shoulder function, taste, saliva, mood, and anxiety. A score of 0 indicates very poor or no functional capacity with regard to that domain, while a score of 100 indicates no disability in that domain. With respect to mood, scores of 0, 25, 50, 75, and 100 correspond to responses of mood being “extremely depressed,” “somewhat depressed,” “neither in a good mood or depressed,” “generally good,” and “excellent,” respectively. The psychometric properties of the UW-QOL are excellent according to a recent review with good internal consistency.
Results

The number of evaluable patients at the 1-, 3-, and 5-year follow-up was 211, 120, and 54. The mean mood score 1, 3, and 5 years after RT was 52.0, 55.7, and 62.1, respectively. The proportion of patients who reported their mood as “somewhat depressed” and “extremely depressed” at 1 year after completion of RT was 12% and 5%, respectively. At 3 years, the corresponding percentage of patients was 8% and 7%, respectively. Of the 54 patients in whom data were available at 5 years, the corresponding percentages were 9% and 4%, respectively. No statistical differences were noted with respect to mood score or the prevalence of depression over time (P = .42).

The figure illustrates the mean mood scores of patients returning for follow-up over time after completion of RT. The UW-QOL also indicated that 30%, 24%, and 29% of all evaluable subjects cited mood as 1 of the 3 most important factors contributing to their quality of life within the previous 7 days at the 1-, 3-, and 5-year follow-up, respectively. Among the patients reporting their mood as either “somewhat depressed” or “extremely depressed” at the 1-, 3-, and 5-year follow-up, the proportion using antidepressant medications at the time was 6% (2 of 36), 11% (2 of 18), and 0% (0 of 7), respectively. The corresponding proportion of patients actively undergoing or seeking psychotherapy and/or formal outpatient counseling was 3%, 6%, and 0%, respectively. When the analysis was limited to patients reporting their mood as “extremely depressed” at the 1-, 3-, and 5-year follow-up, the proportion using antidepressant medications was 10% (1 of 10), 13% (1 of 8), and 0% (0 of 2), respectively, with none undergoing or seeking counseling. No patient expressed suicidal ideation or required inpatient hospitalization because of their psychosocial functioning. The proportion of patients reporting “excellent” mood at the 1-, 3-, and 5-year follow-up was 14%, 9%, and 11%, respectively.

Table 2 outlines the incidence of depression (mood score ≤25) at 1 year according to various clinical, disease, treatment, and demographic factors. Variables found to be significantly associated with increased post-RT depression were the presence of tracheostomy tube or laryngeal stoma (P = .01), gastrostomy tube dependence (P = .01), and continued tobacco use at the time of follow-up (P < .001). The mean scores were 33.1 and 36.3 for patients actively smoking at 1 and 3 years after RT, respectively, compared with mean scores of 57.6 and 60.0, respectively, for nonsmoking patients (P < .001).

Discussion

The results of this cross-sectional analysis, representing one of the few studies that have evaluated rates of depression among long-term survivors of head and neck cancer, are noteworthy in several ways. Foremost, they demonstrate that a relatively high proportion of patients report depressive symptoms after completing RT despite having their cancer evidently under control. Just as surprising, only a small minority of these patients were using appropriate antidepressant medications and/or actively undergoing or seeking psychiatric care. The fact that none of these patients had a pre-existing diagnosis of mental health problems suggests that the diagnosis of cancer and/or sequelae of subsequent treatment were likely the primary causes for their psychosocial symptoms. Indeed, we found that the proportion of patients reporting mild or severe depression was 17%, 15%, and 13% at 1, 3, and 5 years, respectively, after completion of RT. Others have similarly suggested rates of depression ranging from 8% to 44% at various time points after head and neck cancer treatment, with the wide range likely due to the variability in screening instruments and patient characteristics across studies.

The late toxic effects of RT to the head and neck have been well described, with adverse effects potentially including dysphagia, xerostomia, taste loss, neck fibrosis, speech difficulties, aspiration, and neuropathy. Although these have been shown to occur at a relatively high rate after RT, the present series is one of the first to suggest that these might contribute to long-term emotional distress. Indeed, both tracheostomy and gastrostomy tube dependence, which are physically visible and chronic reminders of the disruption of treatment on
normal functioning, have been shown to affect self-esteem.9,10 Gotay et al11 reported that fear of the unknown, ability to attend family functions, the effect of illness on employment, the possibility of a terminal illness, and restrictions on activities drive psychosocial functioning for patients with cancer.

This study is particularly important because the consequences of untreated depression can be severe. Several reports have demonstrated that the incidence of suicide in patients with cancer may be as much as 10 times higher than among the general population.12 From a therapeutic standpoint, untreated depression has been demonstrated to affect compliance to prescribed therapy, wound healing, appetite, and contribute to prolonged hospital stays.13 The effects of depression on such functions as sleep, energy, and motivation have also been well described.14 By intensifying weight loss and fatigue, depression also has the potential to exacerbate treatment-related adverse effects leading to a vicious cycle that may not only worsen depression and increase disability but also affect disease control. Compounding this predicament is the fact that mental health services are severely underutilized among patients with cancer. Consistent with our findings, Patik et al15 reported that even though 36% of 1109 patients had significant depression, less than 3% sought professional counseling.

There are several limitations to this study. First, socioeconomic differences including financial status and educational level were not analyzed, which may be important because Galea et al16 showed that the poverty and crime associated with urban neighborhoods were associated with depression. Similarly, it was impossible to precisely assess the strength of the patients’ social network, which may also contribute to psychosocial functioning. We were also unable to account for medical comorbidities, as others have shown higher rates of depression in the patients with chronic illnesses such as heart failure, chronic obstructive pulmonary disease, and peripheral vascular disease.17 In addition, the effect of head and neck surgery on a patient’s form and function can also be notable, despite the fact that we were unable to show a difference in psychosocial functioning between patients treated by definitive and postoperative RT. This is likely due to variability in the extent and nature of the surgical procedures performed. For instance, total laryngectomy is associated with more psychosocial morbidity than tonsillectomy. In this sense, heterogeneity with respect to disease sites, histologic subtype, and various other characteristics makes interpreting conclusions difficult. Furthermore, it was uncertain what the contributions of continued alcohol and/or illicit or prescription drug use—behaviors that can certainly contribute to impaired psychosocial functioning—were with respect to depression. Finally, the lack of baseline depression assessment at diagnosis makes it more difficult to draw definitive conclusions. While others have shown that many patients with depression after completion of RT were already symptomatic to varying degrees prior to beginning treatment, the fact that we excluded patients without a previous diagnosis of depression makes it more likely that it was the underlying diagnosis of cancer and the subsequent treatment, which contributed most to psychosocial distress.18

It must be recognized that the UW-QOL was developed as a screening tool and not for formal diagnosis. Notably, it suffers from the problems inherent in any self-reporting inventory in that scores can be exaggerated or minimized. While the accuracy of these screening tools has been extensively vali-
dated, they are largely meant to measure severity of symptoms rather than for making a diagnosis. We thus acknowledge that the cutoffs used to determine “somewhat” and “extreme” depression, for instance, may appear somewhat arbitrary and that the limited number of patients in this study did not allow us to perform a more detailed analysis of potential differences between these groups.

Although patients with scores consistent for moderate or severe depression in the present study were generally referred for subsequent counseling and/or psychiatric care, the compliance to such recommendations were extremely low, as exemplified by the persistently low rates of antidepressant medication use during the period patients were screened. The reasons for this observation are multifactorial but include insurance or other financial barriers, absence of a primary care physician, lack of patient interest, poor follow-through, and the social stigma of mental illness. Thus, our results identify a sorely unmet need for survivors of head and neck cancer in that psychosocial services for this population are underutilized and/or inaccessible despite a relatively significant rate of depression. Clearly, additional studies with longer follow-up are needed to recognize and assess the potential impact of depression on patient quality of life, as well as to better define the role of aggressive and timely intervention in the future.

REFERENCES

5. Rogers SN, Rajawat B, Goru J, Lowe D, Humphris GM. Comparison of the domains of anxiety and mood of the University of Washington Head and Neck Cancer Questionnaire (UW-QOL V4) with the CES-D and HADS. Head Neck. 2006;28(8):697-704.