Distress Screening as a Predictor for Perioperative Outcomes in Head and Neck Cancer Patients

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Abstract

Objectives: An estimated 20-60% of head and neck cancer patients have reported distress during the evaluation and management of their disease. This study aims to assess for a relationship between distress scores and several perioperative metrics. Design: Retrospective cohort study Setting: Single tertiary care center Main Outcome Measures: 34 head and neck cancer patients during the designated time period were evaluated for their distress screening results. Primary outcomes evaluated are distress scores, stratified by age and subsite, as well as, staging. Power analysis and logistic regression were performed. Results: Significantly lower distress scores were associated with a skin primary site (OR = 0.06, 0.003-0.41 95% CI, p = 0.01<0.05), and there was a trend toward lower distress score with Medicare insurance (OR=0.11, 0.01-0.76 95% CI, p=0.06>0.05) indicating potential protective factors against distress scores >3. Conclusions: Identifying specific protective factors may objectively help identify new head and neck cancer patients who are at higher risk for greater levels of distress.

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Conclusions: Identifying specific protective factors may objectively help identify new head and neck cancer patients who are at higher risk for greater levels of distress.

Key words: Distress screening, predictor, head and neck cancer, perioperative outcomes, protective factors

Key Points:

1. The Distress Thermometer is a validated tool for assessing distress in patients with cancer.

2. The Distress Thermometer can be used to predict perioperative outcomes in patients with head and neck cancer.
3. Cutaneous malignancies of the head and neck are protective against increased distress when compared to other head and neck cancers.
4. Medicare insurance is a protective factor against increased distress in patients with head and neck cancers.
5. Identify other protective vs predisposing factors for distress in head and neck cancer patients may help to optimize outcomes.

1.1) Introduction

The critical role of psychosocial care in the treatment of cancer patients while addressing their distress, has been widely recognized as a part of the standard of care set forth by the National Comprehensive Cancer Network (NCCN).[1] The NCCN guidelines provide a distress thermometer (DT) screening tool that is recommended at initial visits with new cancer patients, and at additional intervals as clinically indicated. Risk factors for distress are highly prevalent in the head and neck population, including smoking and alcohol use disorders and side effects or functional losses that affect swallow, speech, or cause disfigurement. There is evidence in the literature that head and neck cancer patients have significantly greater psychological distress than patients with other malignancies.[2,3]

Objective: This study aims to evaluate the NCCN Distress Thermometer as it relates to head and neck cancer patient outcomes.

The NCCN distress thermometer allows patients to self-assign an overall distress score on a scale of 1-10, where a score of 1 indicates no distress and a score of 10 indicates extreme distress. Distress is objectively defined on each handout as an "unpleasant experience of a mental, physical, social, or spiritual nature. It can affect the way you think, feel, or act. Distress may make it harder to cope with having cancer, its symptoms, or its treatment".[4] A score of less than four is considered "mild." Patients also indicate areas of particular distress among domains of practical problems, family problems, emotional problems, spiritual/religious concerns, and physical problems.[4] The thermometer has been validated as a relatively specific and sensitive tool (72% and 81% in one meta-analysis, respectively) with this cutoff score of 4.[5]

Evidence suggests that higher levels of distress correspond to longer hospital stays. Known risk factors for higher distress levels in patients include the following: treatments that have significant side effects (e.g. functional losses, such as impairment of swallow or speech postoperatively), pre-treatment mental status, lack of perceived social support, or smoking and alcohol use disorders. [4] For patients who have clinically significant distress levels, there is evidence that proper identification and early intervention affects long-term outcomes. [6] There is evidence that distress is a risk factor for nonadherence to treatment for cancer patients, and is associated with increased length of postoperative hospital stay.[7,8] Schell et al. published the DT findings for a single head and neck cancer subsite - oral cavity squamous cell carcinoma patients.[9]

In this study, we investigate our use of the distress thermometer screening tool for patients undergoing surgical management of head and neck malignancies. We describe quantitative and qualitative results of patient-reported stress. Patient factors leading to higher or lower distress scores were evaluated, as well as, correlation between distress scores and clinical outcomes of time-to-surgery, missed appointments, and cancelled appointments.

1.2) Materials and methods

This is a retrospective, single-institution study that evaluated distress thermometer (DT) scores in head and neck cancer patients of all subsites (except thyroid) who underwent primary surgical treatment of their disease. Institutional Review Board approval was obtained through our tertiary care institution. The patients included in the study were male and female adult patients between the ages of 34 – 90 who presented to a tertiary care referral center between July 2018 and March 2020. Consecutive surgically-treated patients with completed preoperative distress screening were evaluated. The head and neck cancer subsites included

were oral cavity, oropharynx, hypopharynx, supraglottis, glottis, unknown primary, and skin. Despite NCCN guidelines recommending distress screening only for head and neck squamous cell carcinomas, the inclusion of aerodigestive malignancies was purposeful in part due to the availability of additional patient populations and the potential to apply benefits of distress screening to more people. Patients with thyroid malignancies were not included. Only patients who underwent definitive surgery as the primary treatment of their cancer were included, which eliminated patients who completed their DT screening tool but were medically managed.

DT scores were initially manually recorded following new patient visits with a head and neck oncologic surgeon. Patients presented to their visits with a known diagnosis and were then counseled on surgical approaches to their disease. No patients in this study received a new diagnosis at the visit prior to filling out their DT. The DT data was then collected via retrospective electronic medical record review. Patients with DT scores which were recorded or charted incorrectly were omitted.

The primary outcomes evaluated are distress scores, stratified by age, subsite, and staging. The time from initial clinic visit to definitive surgical management was a primary outcome, as well. Additional care-related metrics are number of missed appointments, including no-shows and cancellations and the time from primary surgical treatment to adjuvant chemoradiation start date (ideally within 6 weeks). We also collected insurance information, smoking status, ethnicity, staging, and histology.

Patients distress was stratified as low (less than 4) or high (4 or greater). Logistic regression analysis was performed to identify risk factors for distress as a binary variable of low or high. Patient factors included in analysis included gender, insurance type, recurrent disease, tumor subsite, and the need for free flap reconstruction.

Logistic regression analyses were also conducted for the following outcomes: greater than 25 days to surgery' cancelled outpatient post-operative appointments; and "no-show" post-operative appointments as binary outcomes. Statistical analyses were performed using R statistics package (R Core Team, Vienna, Austria, version 4.0.2). Odds ratios were considered to be statistically significant at $p<0.05$.

A priori power analysis using the Gpower 3.1.9 online calculator was conducted to determine the sample size needed to establish sufficient power of 80% (α=0.05) in a univariant logistic regression.[10] A sample size of >21 was required and produced a power of 82%.

1.3) Results

The characteristics of the patients included in the study are listed in Table 1. There were 24 males and 10 females in the study, with 15 privately insured, 9 on Medicare coverage, 8 on Medicaid, and 2 with VA coverage. The average age was 66 years, with a range from 34-90. As shown in Table 2, the mean DT scores for the patient population, stratified by subsite. Table 3 reveals average DT scores stratified by pathologic diagnosis. Twenty-six patients had squamous cell carcinoma (SCC), four patients had melanoma, one had esthesioneuroblastoma, one had mucoepidermoid carcinoma, one had basal cell carcinoma (BCC), and one had multiphenotypic carcinoma.

The Distress Thermometer was completed for 34 patients. The mean DT distress score was 3.56 (range 0-10) for all new cancer patients (Table 2). Responses for the problem list portion of the NCCN distress thermometer are displayed in Table 4. Time from initial clinic visit to definitive operative management was 25.5 days on average. For the 34 patients closely examined in the electronic medical record, 42 total visits were cancelled. There was a total of 5 "no-show" visits for all comers.

Subsites included seven patients with oral cavity cancer, with a mean DT of 5 (range 0-10), five oropharynx with a mean DT of 3.8 (2-9), three hypopharynx with a mean DT of 4.6 (0-7), three sinonasal with a mean DT of 2.6 (1-5), one nasopharynx with a DT of 5, three larynx with a mean DT of 3.3 (0-6), and twelve skin primaries with a mean DT of 3.6 (0-8). There were no unknown primary patients in this study during the time period of data collection. One person declined to respond to DT scoring questions altogether (skin SCC group). Patients reported distress about these particular categories: practical, physical, and emotional.

On logistic regression, significantly lower distress scores were associated with a skin primary site (OR=0.06, 0.003-0.41 95% CI,$p = 0.01<0.05$), and there was a trend toward lower distress score with Medicare insurance (OR=0.11, 0.01-0.76 95% CI,$p = 0.06>0.05$). No other factors were significantly associated with distress score. The results of this analysis are displayed in Table 5, with Medicare highlighted in Figure 1 and skin primary site in Figure 2. No identifiable patient factors, including higher overall distress score, were associated with prolonged time to surgery, visit cancellation, or visit no-show.

1.4) Discussion

Our review of distress screening among surgically treated head and neck patients revealed a wide range of subjective distress. Analysis revealed an association between skin primary malignancies and subsequent lower distress scores when compared to other sub-site primaries. The analysis also identified Medicare insurance and skin primary sites as being associated with lower distress scores. Female gender was associated with higher distress score, with an odds ratio of 3, although this was not statistically significant. Previous studies have found that female gender is significantly associated with increased pain levels and distress scores. [9] While not statistically significant, a distress score of greater than 3 was also associated with greater than 25 days to surgery (OR=2.25). These results suggest that DT results may be finely examined to further stratify head and neck cancer patients into higher risk groups based on distress level. Increased sample size and power may allow for improved detection of statistically significant predictors of greater distress.[11] These studies may establish a more robust evaluation of how multiple predictors simultaneously affect distress in head and neck cancer patients.

Schell et al. published on the distress screening results from 100 consecutive oral cavity squamous cell carcinoma patients undergoing primary surgical management and found that DT score did not correlate with age or tumor size. Patients in this study with scores greater than or equal to 5 were recommended to seek psychological support through psychosocial support networks and social services provided through our tertiary care institution. [9] The average DT in this study was 5.7. They did find that female patients were more likely to report pain and express fears or problems with nutrition. The head and neck cancer patient population has additionally been identified as increased risk of depression and suicide.[12] There may be a benefit to adjunctive questionnaires used in the clinic setting, such as the Patient Health Questionnaire-4 (PHQ-4).[13]

In this study, there were significant barriers to data collection, including the inconsistency of reporting during early stages of DT tool implementation in 2018; there was significant heterogeneity between documentation across multiple staff team members. There are also barriers to collection of pen and paper forms in the outpatient clinic visit setting, particularly in the context of multiple sheets being handed out to patients (including, for instance, a comprehensive "new patient" form, or medication list). Patients who established care with the service as outside hospital transfers or inpatient or emergency room consults were also not captured. Another limitation of this study is the limited sample size. As use of the screening tool becomes more ubiquitous and the healthcare team documents it in a uniform fashion, there will be a larger patient population to study with greater power.

For future directions, it would be valuable to collect DT information at visits beyond the initial clinic visit. Literature suggests initiating DT at "pivotal medical visits," which suggests that if, for instance, there is a change in treatment plan or completion of treatment regimen, then it would be appropriate to repeat the screen.[13]This will also help provide a more complete picture of distress for the head and neck cancer patient over time, as he or she journeys through diagnosis and treatment. Knowledge of the trends in distress scores is valuable as it relates to patient outcomes and specific barriers to care in the head and neck cancer patient population.

1.5) Conclusions

The DT screening tool provides insight into the head and neck cancer patient experience. In this study having a skin subsite was found to be a protective factor against distress scores greater than 3. This is a preliminary investigation into our practice of distress screening that provides imperative evidence that patients experience

distress on different levels, and there may be disease-specific factors leading to distress. Understanding these disease-specific factors may allow us to treat our whole-patients in a personalized manner, particularly as other clinicians adopt similarly holistic approaches to patient care.

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