Waiting for Thyroid Surgery: A Study of Psychological Morbidity and Determinants of Health Associated With Long Wait Times for Thyroid Surgery

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Objectives: Patients with thyroid pathology tend have longer surgical wait times. Uncertainty during this wait can have negative psychologically impact. This study aims to determine the degree of psychological morbidity in patients waiting for thyroid surgery.

Study Design: Prospectively assessing patients pre- and postoperative psychological morbidity (level 2c).

Methods: Patients waiting for thyroidectomy were mailed a sociodemographic and four psychological morbidity questionnaires: Impact of Events Scale–Revised (IES-R), Illness Intrusiveness Ratings Scale (IIRS), Perceived Stress Scale (PSS) and Hospital Anxiety and Depression Scale (HADS). We assessed whether anxiety was related to length of wait and a number of clinical/sociodemographic factors.

RESULTS: We achieved a 53% response rate over a 3-year period, with 176 patients providing complete preoperative data; and 74 (42%) completed postoperative data. The average age was 53 (±12) years; 82% were female. Respondents with a suspicious or known malignancy waited an average of 107 days while those with benign neoplastic biopsies waited an average of 218 days for thyroidectomy. Respondents reported substantial psychological morbidity with high IES-R, IIRS, PSS, and HADS scores. There was no significant association between psychological morbidity and wait times, clinical or sociodemographic factors. Postoperative anxiety decreased significantly in all psychological morbidity measures except for the IIRS.

Conclusions: Patients waiting for thyroid surgery have mild to moderate psychological morbidity and long wait times for surgery. These appear not to be related. Psychological morbidity decreases after surgery. Reducing wait time can potentially reduce the time that patients have to live with unnecessary stress and anxiety.

Key Words: Thyroid, Nodule, Cancer, Wait times, Anxiety, Depression, Stress, Illness Intrusiveness, Sociodemographic Factors.

Level of Evidence: 2c—Outcomes Research

Laryngoscope, 123:541–547, 2013

INTRODUCTION

Waiting for health care is an important source of anxiety for Canadians and it has become a preoccupation for health care professionals, health administrators, and governments.1 One of the determinants of high quality care is to provide timely access to medical and surgical services.1 Surgical wait lists exist in many health care systems because resources are limited in comparison to the demand for surgical care. Patients waiting for surgery or medical treatment are burdened with a significant amount of emotional distress and anxiety.2,3 This experience has been documented in patients...
MATERIALS AND METHODS

Design and Population

We surveyed patients on the wait list for thyroidec- tomy at three University of Toronto teaching hospitals Mount Sinai Hospital (MSH), Sunnybrook Health Sciences Center (SHSC), or at the University Health Network (UHN). Approval for this project was granted through MSH, SHSC, and UHN’s research ethics boards. The surgeons at all three centers hold similar management philosophies for thyroid cancer and thyroid nodules, generally adhering to the American Thyroid Association guidelines.13 Patients were eligible for inclusion if they were on the surgical wait list for thyroidec- tomy for management of either a newly diagnosed, previously untreated well-differentiated (papillary or follicular carcinoma) thyroid cancer or, indeterminate thyroid nodule in whom surgery was required for a definitive diagnosis of cancer. Patients were also eligible if they had a benign fine-needle aspiration biopsy (FNAB) and were on the wait list for thyroidec- tomy usually to rule out malignancy in the setting of risk factors, concerning ultrasound features, persistent growth, or patient preference. Patients must have been over age 18, residents of Ontario, and able to read and write English. Patients were excluded if they had a previous total or partial thyroidec- tomy, were scheduled for surgery within 2 weeks of the expected date to receive the questionnaire package, had a history of severe active depression or alcohol/drug addiction, had a medical reason for delay of procedure (such as stabilization of an acute medical problem), were pregnant, had abnormal preoperative TSH (<0.1 or >10), or had a concurrent diagnosis of primary or tertiary hyperparathyroidism for which surgery was to be performed concurrently with thyroid surgery. It should be noted that patients who wished to defer surgery for personal reasons (end of school term, work/business commit- ments, etc.) were included in the study and the extra wait time incurred by patient choice was not subtracted from the total wait time.

The surgical wait lists for each of the eight surgeons at the three centers were acquired and all patients on the list who met the inclusion criteria received a research package by mail. Sampled patients received a questionnaire package, which included a personalized cover letter from the patient’s surgeon, two consent forms, an instruction form, the questionnaires, and a return envelope with address, and prepaid postage. A second identi- cal package was mailed to nonrespondents 4 weeks after the initial mailing to maximize response rates to the questionnaires.14 Three separate batches of mail-outs were performed in January of 2008, September of 2008, and last in September of 2009. These months were selected deliberately in order to contact patients when they would be expected to return from any holidays. The time between batches was also planned in order to include new patients on the wait list for thyroid surgery, as well as to ensure a representative sample of patients with various wait times for surgery.

A convenience sample of patients who returned the pack- age completed them a second time at the first postoperative follow-up visit to determine whether wait time-related psycho- logical distress decreased after surgery. Patients completed the questionnaires just prior to seeing their surgeons and receiving the final pathology results, in order to avoid confounding anxiety with the results of the diagnosis.

Sociodemographic, pathologic, treatment, and wait times data were collected for all the subjects recruited either through chart review or mail-out. A more limited chart review was performed on nonrespondents to document age, gender, length of wait to survey completion, length of wait to surgery, and FNAB diagnosis. FNAB results were divided into suspicious/malignant or a nonmalignant group, which includes all other pathologies including benign, follicular nodular hyperplasia, colloid nodule, Hurthle cells, follicular lesion, indeterminate, and insufficient cellularity. It was the surgeon’s prerogative to determine if the patient with a follicular lesion, indeterminant lesion, or insufficient cellularity was triaged to a malignant wait list (maximum wait time of 84 days) or a benign wait list based on the overall judgment of the clinical scenario.

Psychological morbidity was measured using the following instruments, for all of which high scores indicate increased distress:
The Hospital Anxiety and Depression Scale (HADS) is a 14-item questionnaire which entails two 7-item subscales to provide separate measures of anxiety (HADS-A) and depression (HADS-D). The HADS-A and HADS-D each have a possible range of scores from 0 to 21. The anxiety and depression scores are categorized as normal (0–7), mild (8–10), moderate (11–14) and severe (15–21). An overall score can be created by summing these two subscales. The original description of the HADS suggested cut-off scores of 8 or higher to identify possible cases of anxiety and depression and 11 or higher for probable cases. It has since been suggested that anxiety and depression scores should be summed and that the optimum threshold is a combined cut-off score of 19 or higher.

The Perceived Stress Scale (PSS) measures perceptions of stress during the preceding month using 10 questions about various events in the life of the respondent. A total PSS score is calculated by summing scores across all 10 questions, yielding a minimum score of 0 and a maximum score of 40. The mean score observed in a large U.S. population was approximately 13 (±6).

The Impact of Events scale-revised (IES-R) is a 22-item self-report indicator of three fundamental stress-response syndrome features: intrusion, avoidance, and arousal. Symptom severity is graded using a Likert-like rating scale, ranging from 0 = “Not at all” to 4 = “Extremely”. The amount of distress can be represented by summing the individual item scores to give a total score or by calculating the average scores for each subscale or for the entire questionnaire yielding a score that can range from 0 to 4. The latter method can be correlated to the original rating scale descriptor.

The Illness Intrusiveness Rating Scale (IIRS) is a 13-item, self-report questionnaire that asks respondents to rate the degree to which their “illness and/or its treatment interfere” with each of 13 life domains central to subjective quality of life. Each domain is rated using a seven-point scale, and summed total scores can range from 13 to 91. This has been used widely in a variety of patient populations with available descriptive statistics.

**Statistical Analysis**

Descriptive statistics were used to summarize the results of the sociodemographic questionnaire and chart review after appropriate categorization. The relationship between wait time and psychological distress was tested using Pearson correlations for continuous data and the Mann-Whitney tests for dichotomous data. We decided a priori to control for covariates that were related to three or more of the psychological morbidity questionnaires in a multiple regression analysis.

A paired t-test was used to compare pre- and post-surgery psychological morbidity measures. We used a χ² test of association and a two-sample t-test to make comparisons between our cohort of patients that completed pre- and postoperative assessments with those that did not and to compare respondents to nonrespondents. We used a t test for normally distributed data and a Mann-Whitney test for data that was not normally distributed when comparing respondents to nonrespondents as well as the suspicious/malignant group and the nonmalignancy group. Statistical significance was defined as a P < 0.05. For the analysis we defined length of wait to survey completion as both a continuous variable and a dichotomous variable (< 84 days or ≥ 84 days) using the Cancer Care Ontario guidelines for wait times for this procedure.

**RESULTS**

Three-hundred and thirty-four eligible patients were sent a package, of which 176 packages were returned (i.e. a 53% response rate). Table I. summarizes the characteristics of the 176 respondents.

Table II compares respondents and nonrespondents. Respondents tended to be significantly older and had a significantly shorter wait time until surgery than nonrespondents. There were no differences in gender or FNAB results between those who responded and those who did not respond.

Mean and median wait times for surgery at the time of survey completion were 122 (SD 86) and 96 days, respectively. The range for wait time at survey completion was 6 to 365 days. Figure 1 highlights the wait time for the sample broken down by month. Ninety-seven patients (55%) were waiting more than the 84 days. Only one patient was given an exact date for surgery at the date of decision to operate, whereas 66% were given an approximate date but no exact date and 33% were given no date and no approximate date. At the time of survey completion only 43 (24%) respondents had a date for surgery.

Because of the variability in our FNAB diagnoses and the differential wait times expected for our nonmalignant and suspicious/malignant biopsy groups, we compared wait time and patient characteristics for these groups (Table III). There was a statistically significant difference in mean wait times between patients with a FNA diagnostic or suspicious for cancer (107 days, SD 98) and those with a nonmalignant FNA result (218 days, SD 134, P < 0.0001).
**Evaluation of Psychological Morbidity:** Table IV reports descriptive statistics for these instruments, including means, medians, and observed ranges. The mean HADS overall score was 20.4, with the mean HADS anxiety score being 8.6 and the mean HADS depression score being 11.8. The anxiety score is in the low range and the depression score in the moderate range based on normative data. The mean PSS was 22.8, which is elevated above a large U.S. population. The IES-R mean score was 27.6, which is in the ‘a little bit’ to ‘moderate’ distress range. The IIRS mean score was 29.3.

Table V reports the difference in each of the psychological morbidity questionnaires with increased length of wait. Mean scores did not differ significantly for any instrument (i.e. the HADS, PSS, IES-R, or IIRS) based on wait time, either as a dichotomous or continuous variable resulting in nonsignificant P-values (Table V). There were no statistically significant differences on these instruments when comparing groups based on pre-operative FNAB result (risk of malignancy).

**Covariate Selection**

A series of statistical tests were performed to determine whether other clinical or sociodemographic factors were associated with the outcome measures, and therefore might require statistical control in testing our hypothesis. For the IES-R, the non-English first language group had a higher IES-R score by 8.98 (SE = 3.10, P = 0.004). For the IIRS, patients with compressive symptoms had scores that on average were 8.95 higher (SE = 4.07, P = 0.03) than those without symptoms. For every 1 year increase in age, the IIRS decreased by 0.29 (SE = 0.11, P = 0.01). For every one point increase in social support score there was a 1.28 decrease in IIRS (SE = 0.51, P = 0.01). For the PSS, male gender was associated with an average of 1.91 lower PSS score (SE = 0.96, P = 0.049). For the HADS-A, a positive family history of thyroid cancer showed on average a 2.54 (SE = 0.95, P = 0.008) and a 2.24 HADS (SE = 0.99, P = 0.03) higher score respectively compared to the negative family history groups. For the HADS-D, 1-cm increase in nodule size was associated with a 0.46 increase in HADS-D (SE = 0.17, P = 0.007) and 1 hyphen;point increase in social support score was associated with a 0.22 increase in HADS-D score (SE = 0.09, P = 0.01). For the HADS, a positive family history of cancer showed on average a 1.58 higher HADS score (SE = 0.75, P = 0.04) compared to the negative family history group. There were no statistically significant differences in anxiety score as a function of the surgeon who provided treatment. There were also no statistically significant differences in anxiety between patients who received an approximate date of procedure as compared to those who were not provided with one. Multivariate analysis corroborated the univariate results. Since none of the potential covariates related significantly to three or more of the psychological morbidity questionnaires, there was no need to control for them systematically (and so a multiple regression analysis was not performed).

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**Table II.** Patient Characteristics (Respondents vs. Nonrespondents).

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Respondents</th>
<th>Non-Respondents</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td>&lt;0.01*</td>
</tr>
<tr>
<td>Female</td>
<td>176 81%</td>
<td>144 81%</td>
<td>1.00</td>
</tr>
<tr>
<td>Wait time to first mail-out in days (DDTO to date sent 1st mail out)</td>
<td>176 100 (±83)</td>
<td>144 121 (±122)</td>
<td>0.274</td>
</tr>
<tr>
<td>Total wait for surgery</td>
<td>128 155 (±111)</td>
<td>119 222 (±152)</td>
<td>&lt;0.01*</td>
</tr>
<tr>
<td>FNA biopsy results</td>
<td>160</td>
<td>131</td>
<td></td>
</tr>
<tr>
<td>No FNA performed</td>
<td>16 9%</td>
<td>13 9%</td>
<td>1.00</td>
</tr>
<tr>
<td>Low and mild risk (benign, follicular nodular hyperplasia, colloid nodule, nondiagnostic)</td>
<td>111 63%</td>
<td>93 65%</td>
<td>0.84</td>
</tr>
<tr>
<td>Moderate risk (Hurthle cell neoplasm or follicular lesion)</td>
<td>21 12%</td>
<td>15 10%</td>
<td>0.72</td>
</tr>
<tr>
<td>High risk (papillary carcinoma or suspicious for papillary carcinoma)</td>
<td>28 16%</td>
<td>23 16%</td>
<td>1.00</td>
</tr>
</tbody>
</table>

*p < 0.05.

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Fig. 1. Wait Time by Month Length of wait at survey completion by months with percentage of total sample above each bar.
Comparing Pre- Versus Postoperative Anxiety.
Seventy-four patients who completed the initial package preoperatively were included for the longitudinal component of the study. They completed a questionnaire package after thyroidectomy. Mean scores for each of the HADS, IES-R, and PSS showed statistically significant declines after surgery (Table VI). For the IIRS there was no statistically significant change.

DISCUSSION
A significant proportion of patients are waiting longer than recommended by the Cancer Care Ontario (CCO) guidelines for both suspicious/malignant and nonmalignant thyroid surgery, although this is more extreme in the nonmalignant group (177.5 days vs. 76 days).27,28 Improvements are still required to achieve shorter wait times for both groups.

Although thyroid cancers, in general, are associated with excellent survival and the additional wait is unlikely to have any adverse effect on patients’ survival, the surgeons involved in this study were concerned about the psychological impact that the long wait may have on their patients.

Our patient sample had mean scores on the overall HADS, HADS depression, and HADS anxiety scale that were higher than normative data.15–17 The anxiety score is in the low range and the depression score in the moderate range based on normative data.15 A recent Italian study confirmed that the original scoring and use of the HADS qualifies in oncologic settings.29 Although it is difficult to draw meaningful comparisons between different study samples when they present with different malignancies, the present findings suggest that our patient sample experiences similar or slightly more intense stress and anxiety scores than patients with early stage breast cancer as assessed in an Italian study.30

The mean PSS in our population (22.8) was elevated above that observed in a large U.S. population.31 PSS scores have been evaluated in other oncologic populations. Traeger et al. reported PSS scores in patients who either underwent surgery or radiation for prostate cancer. The mean PSS score in this patient population was 17.9.51 Similarly, the mean total score was 17.6 for patients with stage 2 and 3 breast cancer 3 months following surgery while awaiting adjuvant treatment.32 Overall, our patients showed significantly elevated PSS scores compared to population norms and similar or higher than other cancer populations.

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TABLE III. Patient Characteristics by FNA Biopsy.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Suspicious/Malignant</th>
<th>Benign Neoplastic</th>
</tr>
</thead>
<tbody>
<tr>
<td>N =</td>
<td>% or Mean (SD)</td>
<td>Median</td>
</tr>
<tr>
<td>Age</td>
<td>51</td>
<td>48 (13)</td>
</tr>
<tr>
<td>Female</td>
<td>51</td>
<td>84%</td>
</tr>
<tr>
<td>Total wait for surgery</td>
<td>50</td>
<td>107 (98)</td>
</tr>
<tr>
<td>Married or common law</td>
<td>28</td>
<td>86%</td>
</tr>
<tr>
<td>Employed (full-time, part-time or self-employed)</td>
<td>28</td>
<td>75%</td>
</tr>
<tr>
<td>Completed some post-secondary education</td>
<td>28</td>
<td>86%</td>
</tr>
<tr>
<td>Number of years in school (from grade 1)</td>
<td>28</td>
<td>14.5 (4.1)</td>
</tr>
<tr>
<td>Born in North America</td>
<td>28</td>
<td>50%</td>
</tr>
<tr>
<td>English as mother tongue (first language)</td>
<td>28</td>
<td>46%</td>
</tr>
<tr>
<td>Annual household income (less than $50K, $50K–$100K, greater than $100K)</td>
<td>25</td>
<td>28%/40%/32%</td>
</tr>
<tr>
<td>Social support score</td>
<td>28</td>
<td>9.1 (3.0)</td>
</tr>
<tr>
<td>Family history of any cancer</td>
<td>28</td>
<td>72%</td>
</tr>
<tr>
<td>Family history of thyroid cancer</td>
<td>28</td>
<td>29%</td>
</tr>
<tr>
<td>Personal history of cancer</td>
<td>27</td>
<td>3.7%</td>
</tr>
</tbody>
</table>

---

TABLE IV. Results from Intrusiveness, Stress, Anxiety and Depression Scales.

<table>
<thead>
<tr>
<th>Questionnaire</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>Median</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>HADS-Anxiety</td>
<td>176</td>
<td>8.62</td>
<td>4.62</td>
<td>8</td>
<td>0</td>
<td>21</td>
</tr>
<tr>
<td>HADS-Depression</td>
<td>176</td>
<td>11.83</td>
<td>3.28</td>
<td>12</td>
<td>0</td>
<td>19</td>
</tr>
<tr>
<td>HADS Total</td>
<td>176</td>
<td>20.44</td>
<td>4.69</td>
<td>20.5</td>
<td>0</td>
<td>34.5</td>
</tr>
<tr>
<td>PSS</td>
<td>176</td>
<td>22.77</td>
<td>5.04</td>
<td>23</td>
<td>0</td>
<td>40</td>
</tr>
<tr>
<td>IES-R</td>
<td>176</td>
<td>27.64</td>
<td>21.00</td>
<td>24</td>
<td>0</td>
<td>84</td>
</tr>
<tr>
<td>IIRS</td>
<td>174</td>
<td>29.29</td>
<td>19.02</td>
<td>21</td>
<td>13</td>
<td>87</td>
</tr>
</tbody>
</table>

TABLE V. Estimate of Change in Anxiety with Length of Wait.

<table>
<thead>
<tr>
<th>Measure</th>
<th>Estimate</th>
<th>SE</th>
<th>P-value (Continuous)</th>
<th>P-value (Dichotomous)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HADS-A</td>
<td>-0.0026</td>
<td>0.004</td>
<td>0.520</td>
<td>0.866</td>
</tr>
<tr>
<td>HADS-D</td>
<td>-0.0006</td>
<td>0.003</td>
<td>0.834</td>
<td>0.766</td>
</tr>
<tr>
<td>HADS Total</td>
<td>-0.0032</td>
<td>0.004</td>
<td>0.434</td>
<td>0.715</td>
</tr>
<tr>
<td>PSS Total</td>
<td>-0.0022</td>
<td>0.004</td>
<td>0.627</td>
<td>0.636</td>
</tr>
<tr>
<td>IES-RTotal</td>
<td>-0.0178</td>
<td>0.018</td>
<td>0.339</td>
<td>0.277</td>
</tr>
<tr>
<td>IRSRTotal</td>
<td>-0.0239</td>
<td>0.017</td>
<td>0.156</td>
<td>0.792</td>
</tr>
</tbody>
</table>
The IES-R mean score in our population (27.6) was in the ‘a little bit’ to ‘moderate’ distress range.21 Mothers and fathers of children undergoing cancer treatment report average scores of 43.6 (± 14.0) and 32.6 (± 21.5) respectively, while mothers and fathers of children having completed treatment and survived their cancer had scores of 28.2 (± 24.5) and 24.2 (± 20.0) respectively.22

The IIRS scores (mean score of 29.3), were consistent with observations in other cancer patient samples. A study of IIRS in patients with various cancers who underwent treatment ranged from 28.6 in prostate cancer patients to 37.7 in lung cancer patients.24,25 Thus, thyroid cancer which in many ways is similar in its indolent nature to early-stage prostate cancer have similar scores.

Our sample of patients waiting for thyroidectomy reported mild to moderate stress and anxiety. Length of time on the wait list was not associated with increased rates of stress and anxiety. However, there was a significant decrease in most psychological morbidity measures postoperatively, despite the fact they did not yet receive the final pathology results from their surgeons. The observation of a significant decrease supports the hypothesis that having the surgery itself is associated with significantly reduced psychological morbidity independent of the stress associated with diagnosis. This is further supported by the fact that IIRS did not significantly change postoperatively, indicating that the illness or the possibility of having thyroid cancer is still quite intrusive. Although the length of wait for surgery may not influence stress and anxiety, this patient population exhibits significant stress and anxiety that decreases following surgery. By shortening wait times for surgery, we can thereby reduce the duration for which patients must live with unnecessary stress and anxiety. A study by Sung et al. using the HADS showed that most patients with well-differentiated thyroid cancer are psychologically stable long-term after their thyroid surgery, with very low anxiety and depression rates.26

One of the limitations of this study was the 53% response rate, although this is comparable to (but in the lower spectrum of) that reported in the oncology literature. Reasons for nonresponse may be due to increase in length of survey, number of sensitive questions, limitations in the number of mail-outs and limited familiarity with the surgeon requesting participation in research.37–42 The major concern with response rate is the potential for nonresponse bias. There were differences between the respondents and nonrespondents. Respondents tended to be significantly older, with a shorter wait time until surgery than nonrespondents. If our group of respondents that clearly seemed dissatisfied and showed a significant amount of psychological morbidity preoperatively waited a shorter amount of time to first mail-out and ultimately had shorter wait time until surgery, this would lead us to speculate that nonrespondents could have possibly been even more dissatisfied and distressed.

Another limitation of this study is that it did not examine patients at multiple points in time preoperatively. While a longitudinal study design may have increased ability to detect change in psychological morbidity over time, it was felt that a large study done at two different time periods would provide a large enough sample to show some association. It is assumed that stress and anxiety would remain stable or increase over time rather than fluctuate and therefore a cross-sectional design would give an accurate representation of stress and anxiety at the various preoperative time points.

CONCLUSION

Patients waiting for thyroid surgery have mild to moderate psychological morbidity and long wait times for surgery, although these appear unrelated. Stress and anxiety levels decrease after surgery. For some patients reducing wait time can potentially reduce the time that patients have to live with unnecessary stress and anxiety but it also clear that for all patients a clearer understanding of the biology of the disease and the overall prognosis could go an even longer way to reducing unnecessary anxiety regarding the potential diagnosis of thyroid cancer.

Acknowledgment

This work would not have been possible without the dedication and hard work of the Wharton Head & Neck Research Assistant Colleen Simpson.

BIBLIOGRAPHY


