Hyperthyroidism in patients with thyroid cancer

Sunil Sharma¹, Gaurav Kumar¹, Hesham Kaddour¹
¹ENT Department, Barking, Havering and Redbridge University Hospitals NHS Foundation Trust

ABSTRACT

Aims: To present a case series of patients with hyperthyroidism and thyroid cancer, and to look at the clinical characteristics and outcomes of these patients to determine which patients require further investigation.

Methods: Retrospective review of case notes of all patients with a histopathological diagnosis of thyroid cancer and biochemical evidence of hyperthyroidism treated at a thyroid cancer centre between January 2006 and October 2013.

Results: During the study period, 66 patients were diagnosed with thyroid cancer. Eight patients had biochemical evidence of hyperthyroidism (12.1%). All patients were female. Of these patients, 3 patients were diagnosed with Graves’ disease, 1 patient with toxic multinodular goitre and 4 patients with an autonomously functioning toxic nodule (AFTN). All patients were diagnosed with papillary thyroid carcinoma. The mean size of the tumour in patients with an AFTN was significantly larger than those with Graves’ disease (48.3±25.1mm vs 3.8±1.6mm, p=0.04). The patients with Graves’ disease had incidental papillary microcarcinoma, whilst those patients with AFTN had a poorer prognosis with 2 patients with extracapsular invasion and lymph node metastases and one patient dying from her disease.

Conclusions: The incidence of hyperthyroidism in thyroid cancer patients is high. In contrast to previous literature, patients with AFTN seem to have a more aggressive disease with poorer outcomes when compared to patients with Graves’ disease. Any suspicious nodule associated with hyperthyroidism should be evaluated carefully.

INTRODUCTION

In the early part of the 20th century the literature suggested that hyperthyroidism was protective against thyroid cancer. More recently, the literature describes a high rate of thyroid cancer amongst those patients with hyperthyroidism, up to 8.7%. It has been postulated that one explanation for this rise is the fact that patients are now treated with total thyroidectomy rather than the previously accepted ‘subtotal thyroidectomy’, and therefore there is a larger specimen available for a more thorough histological examination.

As one of the initial investigations for assessing a solitary thyroid nodule found on clinical examination or ultrasonography is an assessment of TSH, it is not uncommon for patients with nodules to be diagnosed with hyperthyroidism. These thyroid nodules can represent a solitary hyperfunctioning nodule in an otherwise normal thyroid gland, a hyperfunctioning nodule within a toxic multinodular goitre or within Graves’ disease.

Here we present a case series of patients with hyperthyroidism and thyroid cancer, and look at the clinical characteristics and outcomes of these patients to determine which patients require further investigation.

METHODS

All patients with a histopathological diagnosis of thyroid cancer at our thyroid cancer centre, between January 2006 and October 2013, were selected. A retrospective review of case notes of all patients with a histopathological diagnosis of thyroid cancer and biochemical evidence of hyperthyroidism was performed. Patient demographics, risk factors for thyroid cancer, ultrasound features, presence of thyrotoxic symptoms, whether an autonomously functioning toxic nodule (AFTN), toxic multinodular goitre or Graves’ disease was present, cytology and histology were all recorded.

A literature search of the Pubmed/Medline database using the MeSH (Medical Subjected Headings) was performed using the following keywords/phrases: thyroid cancer, hyperthyroidism, toxic thyroid nodule, Graves’ disease, toxic multinodular goitre, autonomous adenoma. Review articles, case reports and original research papers were all included.

RESULTS

During the study period, 66 patients were diagnosed with thyroid cancer. Eight patients had biochemical evidence of hyperthyroidism (12.1%). The median age of these patients was 50 years (range 29-87 years). All patients were female.

Three patients (38%) had a high risk history for thyroid cancer (family history of thyroid cancer). Four patients (50%) had suspicious features on their ultrasound examination (microcalcification, hypoechoegenicity, central vascularity). Of the patients with thyroid cancer and hyperthyroidism, 3 patients were diagnosed with Graves’ disease (38%), 1 patient with toxic multinodular goitre (13%) and 4 patients with an autonomously functioning toxic nodule (AFTN), which contained the carcinoma (50%). Five patients had suspicious features on their pre-operative ultrasound (83%). All patients were diagnosed with papillary thyroid carcinoma (Table 1).

The mean size of the tumour in patients with an AFTN was significantly larger than those with Graves’ disease (48.3±25.1mm vs 3.8±1.6mm, p=0.04). All patients with Graves’ disease had incidental papillary microcarcinoma found on postoperative histology, whilst those patients with AFTN had a poorer prognosis with 2 patients with extracapsular invasion and lymph node metastases (case 3 and 7) and one patient dying from her disease (case 8). Within the Grave’s disease group all 3 patients had pT1aN0 staging on postoperative histology, whilst within the AFTN group two patients had postoperative staging of pT3N1a (cases 3 and 7), one had postoperative staging of pT3N0 (case 4), and one with pT4N1b (case 8), suggesting more aggressive disease within this subset of patients.

<table>
<thead>
<tr>
<th>Case</th>
<th>Age</th>
<th>High risk?</th>
<th>Thyroiditis?</th>
<th>Thyroiditis causing?</th>
<th>Thyroiditis causing?</th>
<th>TSH</th>
<th>T4</th>
<th>E4</th>
<th>AFTN</th>
<th>Papillary Microcarcinoma</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>44</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>0.04</td>
<td>0</td>
<td>0</td>
<td>N</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>29</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>0.04</td>
<td>0</td>
<td>0</td>
<td>N</td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>65</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>0.04</td>
<td>0</td>
<td>0</td>
<td>Y</td>
<td>Yes</td>
</tr>
<tr>
<td>4</td>
<td>47</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>0.04</td>
<td>0</td>
<td>0</td>
<td>N</td>
<td>Yes</td>
</tr>
<tr>
<td>5</td>
<td>42</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>0.04</td>
<td>0</td>
<td>0</td>
<td>N</td>
<td>Yes</td>
</tr>
<tr>
<td>6</td>
<td>58</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>0.04</td>
<td>0</td>
<td>0</td>
<td>Y</td>
<td>Yes</td>
</tr>
<tr>
<td>7</td>
<td>56</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>0.04</td>
<td>0</td>
<td>0</td>
<td>N</td>
<td>Yes</td>
</tr>
<tr>
<td>8</td>
<td>74</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>0.04</td>
<td>0</td>
<td>0</td>
<td>N</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Table 1. Characteristics of thyroid cancer patients with hyperthyroidism

CONCLUSIONS

• Hyperthyroidism is predominantly a benign disease, however there is a significant risk of malignancy.

• The majority of these patients with a thyroid cancer will have a papillary microcarcinoma, which carries an excellent prognosis if treated early.

• There are no clear clinical indicators that suggest malignancy in patients with hyperthyroidism.

• In contrast to previous literature, patients with AFTN seem to have more aggressive disease with poorer outcomes when compared to patients with Graves’ disease.

• Any suspicious nodule associated with hyperthyroidism should be evaluated carefully.

REFERENCES


CONTACT

Mr Sunil Sharma, ST5 ENT, sunilsharma@doctors.org.uk