Near total thyroidectomy and compliance of patients on levo thyroxine therapy for life

Mohammad M Aradaib, MRCS Edinburgh*, Sara A Ahmed, MBBS*, Saif I Mahdi, MD, FRCSI*, Ayman Nasr, MD, FRCSI*, **
Mohamed EL Makki Ahmed, MD FRCSI*, **

Khartoum Teaching Hospital*, Department of Surgery, Faculty of Medicine, University of Khartoum**

Abstract
Background
Bilateral subcapsular near total thyroidectomy (NTT) and extracapsular total thyroidectomy (ETT) are now the standard procedures for all types of thyroid pathology requiring surgical treatment. Patients were prescribed Levo thyroxine (L thyroxine) for life. This study was conducted to assess patient’s compliance on L thyroxine therapy in our unit.

Patients and Methods
This study was conducted in one surgical firm in Khartoum Teaching Hospital. Seventy randomly selected post-thyroidectomy patients contacted and interviewed about their compliance and the difficulties encountered in obtaining the drug. Some patients were seen in the hospital and assessed clinically and biochemically (thyroid function test) for hypothyroidism.

Results
Sixty-two patients were aware of the need to use thyroxine for life (88.6%). Only 21...
patients (30%) had an access to the drug, 33 patients (47.1%) had great difficulties in obtaining the treatment and 16 patients (22.9%) were unable to find thyroxine tablets. Only 28 patients (40%) were regular on thyroxine and the remaining 42 patients (60%) stopped taking thyroxine for a mean duration of 3 months (range 2 weeks - 30 months). Patients who developed some symptoms of hypothyroidism were 40 (57.1%) and 17 patients had biochemical hypothyroidism (25%).

**Conclusion**
Availability of thyroxine should be ensured and proper counseling of patients' prior and following thyroidectomy is important. Regular follow-up by personal contacts, interviewing, clinical and hormonal assay are mandatory.

**Introduction**
Following near total thyroidectomy (NTT) and total thyroidectomy (TT) all patients will develop permanent hypothyroidism necessitating lifelong L thyroxine use, so their adherence with thyroxine represents an important issue need to be dealt with and followed regularly.

Non-adherence with prescribed self-administered chronic medications is common problem and it undermines the benefits of effective therapy\(^\text{(1,2)}\). Even the short term medications are subjected to this noncompliance. Teferra Abula et al from Ethiopia reported that 26.1% of patients were noncompliant with the short term treatment(< 10 days) for their acute illnesses\(^\text{(3)}\).

Published studies from African and European countries have shown that a significant proportion of patients who underwent thyroidectomy were not regular on their thyroxine therapy and discontinued their medications\(^\text{(4,5)}\).

The objective of this study was to determine whether patients prescribed L thyroxine following thyroidectomy were compliant and to check for compliance difficulties and reasons behind that.

**Patients and Methods**
All patients underwent thyroidectomy between January 2007 and June 2009 were considered. Patients who had thyroidectomy for malignancy were excluded as well as those with no contact informations.

Patients’ data were regularly kept in standard sheets. The studied patients were first contacted and interviewed by phone (by surgical registrar and a house officer under direct supervision of a consultant). Then 39 of them who reside in Khartoum state were called to the hospital and clinically and biochemically assessed, 3 patients who reside in nearby states were interviewed by phone and their thyroid function test results were obtained also by phone. The remaining 28 patients were from remote areas and were just interviewed by phone, no clinical assessment or biochemical results were obtained.

The standard questions asked were:
- Do you know that you have to use thyroxine for life?
- Are you regular on thyroxine therapy? If not why? When did you stop taking the drug?
- Is it easy to find thyroxine in the pharmacy and is it affordable to purchase?

Do you have symptoms of hypothyroidism; tiredness, sleepiness, forgetfulness, cold intolerance, weight gain, hair loss, skin changes, facial changes, constipation, voice change.

Then patients were invited to come to the hospital for clinical examination looking for signs of hypothyroidism and for biochemical assessment.

**Statistical analysis**
Data were tested for normality and presented as mean or median and range where appropriate. Statistical analysis was performed using the Statistical Package for Social Sciences (version 17; SPSS).
Results
A total of 70 patients were retrieved, the male to female ratio was 1:6. The mean age was 45.7 year (range 19-73 years). Thirty nine patients (55.7%) reside in Khartoum state and 31 patients (44.3%) outside Khartoum. The indications for surgery are shown in Table 1. Operations done: Sixty-five NTT 92.8% (removal of all thyroid tissue, but leaving small remnant of the capsule). Five lobectomy 7.2% (completely removing one lobe and the isthmus). Sixty-two patients were aware of lifelong thyroxine use (88.6%) and 8 patients (11.4%) were not.

Table 1: Indications for surgery

<table>
<thead>
<tr>
<th>Indication</th>
<th>No. of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple nodular goiter with pressure symptoms</td>
<td>28</td>
<td>40%</td>
</tr>
<tr>
<td>Controlled toxic Goiter</td>
<td>12</td>
<td>17.2%</td>
</tr>
<tr>
<td>Retrosternal goiter</td>
<td>18</td>
<td>25.7%</td>
</tr>
<tr>
<td>Recurrent goiter</td>
<td>7</td>
<td>10%</td>
</tr>
<tr>
<td>Solitary thyroid nodule</td>
<td>5</td>
<td>7.1%</td>
</tr>
<tr>
<td>Total</td>
<td>70</td>
<td>100%</td>
</tr>
</tbody>
</table>

Patients’ answers regarding availability of Thyroxine as shown in Table 2.

Table 2: Availability of thyroxine tablets

<table>
<thead>
<tr>
<th>Response</th>
<th>No. of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Found with difficulty</td>
<td>33</td>
<td>47.1%</td>
</tr>
<tr>
<td>Readily available</td>
<td>21</td>
<td>30%</td>
</tr>
<tr>
<td>Not available</td>
<td>16</td>
<td>22.9%</td>
</tr>
</tbody>
</table>

Levo Thyroxine was affordable for the majority of patients (98%). Twenty-eight patients were compliant (40%) on thyroxine therapy and 42 (60%) patients stopped the drug (mean period for stopping thyroxine was 3 months (range 2 weeks-30 months)). The reasons for stopping thyroxine were unavailability, patients’ unawareness and ignorance, patients felt well to take treatment and pregnancy and lactation.

Clinical hypothyroidism
- Forty patients (57.1%) developed symptoms of hypothyroidism, 30 of them were off thyroxine and 10 were on L thyroxine (they were taking sub dose).
- Thirty patients (42.9%) were asymptomatic 18 of them were on thyroxine and the remaining 12 patients were off thyroxine (stopped for short period).

Main symptoms of hypothyroidism developed in patients were tiredness, sleepiness, constipation, cold intolerance, and menstrual disturbances.

In 39 patients who were clinically examined, 1 patient (2.5%) was found to have definite hypothyroidism (clinical symptoms and signs and biochemical changes). This was a 60 years male who stopped thyroxine for 30 months due to unawareness.

Biochemical Hypothyroidism
Thyroid function test was performed in 42 patients:
- Twenty four patients 57.1% were euthyroid. Sixteen patients 38.1% were hypothyroid.
- Ten had subclinical hypothyroidism (no symptoms or signs, high TSH and normal T3 and T4). Six had overt hypothyroidism (have symptoms and/or signs, high TSH and low T3 and T4).
- Two patients 4.8% had subclinical hyperthyroidism (no symptoms or signs, low TSH, normal T3 and T4).
Discussion
The results showed a significant proportion of patients were noncompliant with their medicine mainly due to lack of awareness and thyroxine unavailability. More than half of the patients developed symptoms of hypothyroidism either due to stopping treatment or taking insufficient dose, with only one patient having signs of hypothyroidism. Biochemical hypothyroidism was found in 40.5% of patients who had their serum hormones measured, with 3 patients having hypothyroidism despite being regular on thyroxine.

After thyroidectomy the standard practice in our unit is to prescribe L thyroxine 100 µg once daily with further adjustment of the dose according to thyroid function test. Considering that our patients present from different regions of the country with various levels of health education, their compliance with L thyroxine for life will be doubtful. Following surgery, thyroxine non-compliance is common problem even in developed and well educated societies. Schifferdecker E et al had shown that following thyroidectomy 17% of German patients decided to stop therapy without knowledge of their treating physicians\(^{(4)}\).

Our figure of 60% of patients who stopped taking medication is serious. The main reason why patients stopped taking thyroxine was the unavailability of thyroxine (thyroxine was not available or found with difficulty for 22.9% and 47.1% of patients respectively) and part of the patients needed to bring their medication from outside the country. These bouts of unavailability should be monitored by the Medical Supplies that are in charge of this function. The other factors were all related to patients’ education which included unawareness, ignorance, patients felt they are fine and not in need to the pills any longer. So those factors are all potentially correctable and health providers should do their best to correct them by spending more time to educate the patients about their treatment. Although 57.1% of patients developed symptoms of hypothyroidism, only 38.1% of patients were found to have biochemical hypothyroidism and this could be explained by the fact that some of the symptoms of hypothyroidism are subjective and non specific such as tiredness and sleepiness. Moreover, thyroid function test was only performed on 42 patients. Examination for signs of hypothyroidism (coarse skin, puffy face, slow movements, bradycardia, and ankle reflex) was positive in only one patient. However, despite having normal physical examination 17 patients (40.5%) were found to have biochemical hypothyroidisms which raise the attention that follow-up should include both clinical assessment and hormonal assay and that was stressed by Indra R et al in their study\(^{(6)}\).

Although they were regular on thyroxine, 3 patients were found to have biochemical hypothyroidism and when their thyroxine dose was increased they became euothyroid so coupling of clinical assessment with biochemical assessment is mandatory. Among those who were examined 23.8% were found to have subclinical hypothyroidism which represent serious problem; subclinical hypothyroidism increase the risk of: hyperlipidaemia, aortic atherosclerosis and myocardial infarction. The rate of progression of subclinical to overt hypothyroidism has been reported in about 3% to 18% of affected patients per year\(^{(7,8,9)}\).

Some people might think this problem might be solved by doing subtotal thyroidectomy in order to preserve some the gland secretary function. However, recent evidence doesn’t support this assumption. A large retrospective multicenter cohort study by Michael Vaiman et al included 6,223 patients with postoperative mean follow-up of 7 years comparing the results of different approaches of thyroidectomy (subtotal thyroidectomy
“STT”, near total thyroidectomy “NTT”, and total thyroidectomy “TT”), showed that permanent hypothyroidism occurred in all patients in the TT and NTT groups, compared to 91% of the patients in the STT group. The recurrence of benign disease was noted in 482 patients (21.5%) after STT and 9 patients (5.9%) after NTT. Of the patients with recurrence, 173 needed a completion thyroidectomy. It concluded that there is no statistically significant difference in complications among TT, NTT, and STT groups and partial thyroidectomies provide no decisive advantage over total thyroidectomies in terms of subsequent requirements of supplemental hormone therapy\(^\text{[10]}\).

In recent years, accumulating data suggest that the complication rate - both recurrent laryngeal nerve (RLN) injury and hypocalcaemia are equal for partial and total thyroidectomy\(^\text{[11,12,13,14]}\). Ozbas et al reported administration of L-thyroxine in all cases of partial and total thyroidectomy in their study\(^\text{[14]}\). Therefore, no advantage in performing partial thyroidectomy with respect to supplemental hormone therapy was proven. If we contrast the advantages of NTT against its disadvantages (noncompliance and risk of developing hypothyroidism) the advantages will outweigh the disadvantages. Therefore, in order to achieve the best results some effort should be done to encourage patients to stick to their pills by following them for life by different means like annual visits to the outpatient clinics, or by personal contact like we did in this study and to concentrate on patient’s education.

Different means of methods had been implemented in order to improve patients’ thyroxine compliance like the educational booklet to improve thyroxine adherence by Mike Crilly and Aneez Esmail from UK\(^\text{[15]}\). The administration of once per week dose of thyroxine instead of daily doses for difficult non compliant patients had been reported\(^\text{[16,17]}\). No matter the type of intervention would be used; the end result should be having our patients regular in their thyroxine and in their euthyroid state.

In conclusion, this study shows that patient’s undergoing thyroidectomy will face difficulties with L thyroxine compliance and at risk of developing hypothyroidism. In order to prevent this we recommend that patients should receive proper counseling, offered lifelong follow-up, insures continuous medical supplies and coupling of clinical assessment with biochemical assessment in their follow-up.

References