

AFRICAN JOURNAL OF MEDICINE and medical sciences

VOLUME 41 Second Biomedical Conference Supplement **DECEMBER 2012**



**Editor-in-Chief
O. BAIYEWU**

**Guest Editor
E.O. FAROMBI**

**Asst. Editors-in-Chief
O.O. OLORUNSOGO
B.L. SALAKO**

ISSN 1116-4077

High default rate in thyroid cancer management in Ibadan, Nigeria: a need for health insurance

KS Adedapo, IO Fadiji, AT Orunmuyi, JE Ejeh and BOA Osifo

Department of Nuclear Medicine,
University College Hospital, Ibadan, Nigeria

Abstract

Background: Differentiated thyroid cancer is a potentially curable disease provided there is early diagnosis and full compliance with management modalities. This however becomes a problem in a resource poor environment where most patients pay out of pocket resulting in poor compliance and inability to access standard care due to poverty. This retrospective study was carried out to evaluate the percentage of patients that could afford the cost of care in a premier nuclear medicine facility of a tertiary centre.

Patients, material and method: A total 56 patients with differentiated thyroid cancer managed since the inception of the Nuclear Medicine Department, University College Hospital from June 2006 to March 2010 were included in the study. Socioeconomic status of the patients and the affordability of the nuclear medicine procedure for differentiated thyroid cancer post thyroidectomy were evaluated.

Result: A total of 20 out of 56 (35.7%) patients had total thyroidectomy at presentation, while, 36 had sub-total thyroidectomy. The commonest type of thyroid malignancy was papillary thyroid cancer (51.8%), while follicular cancer accounted for 41.1%. Medullary and Anaplastic thyroid cancers were the least common. Majority of the patients evaluated were within the income bracket of 10,000-30,000 naira (\$67- \$200) per month). The average cost of management of thyroid cancer post total thyroidectomy was \$2500 (N375 000.00) at this centre. Twenty one out of 56 patients (37.5 %) could afford the \$300 cost of diagnostic whole body iodine scan while only 16 patients out 21 (28.6%) could afford the (\$ 1200) cost of radioactive iodine treatment.

Conclusion: With average cost of management of management of thyroid cancer beyond the yearly income of majority of the patients studied, there is need for a comprehensive health insurance policy to make accessibility of care of this potentially curable disease available to most Nigerians.

Keywords: Differentiated thyroid cancer, radioactive iodine treatment, high default rate, health insurance, socioeconomic status

Correspondence: Dr. KS Adedapo, Department of Nuclear Medicine, University College Hospital, Ibadan, Nigeria.

Résumé

Contexte: Le cancer différencié de la thyroïde est une maladie potentiellement curable à condition qu'un diagnostic précoce et en conformité aux modalités soit fait. Ceci devient cependant un problème dans un environnement pauvre en ressources, où la plupart des patients paient de leur poche entraînant ainsi une mauvaise conformité et l'incapacité à accéder à des soins standard en raison de la pauvreté. Cette étude rétrospective a été menée pour évaluer le pourcentage de patients qui peuvent payer d'eux-mêmes le coût des soins dans un service de la médecine nucléaire dans un siècle tertiaire.

Les patients, le matériel et la méthode: Un total de 56 patients atteints de cancer différencié de la thyroïde suivis depuis la création du département de la médecine nucléaire, au Centre Hospitalier Universitaire, de juin 2006 à mars 2010 ont été inclus dans l'étude. La situation socio-économique des patients et la capacité de la procédure en conformité avec les exigences de médecine nucléaire pour le cancer de la glande thyroïde après la thyroïdectomie ont été évaluées.

Résultat: Un total de 20 sur 56 (35.7%) patients ont eu une thyroïdectomie totale lors de la présentation, tandis que, 36 avaient thyroïdectomie sous-totale. Le type du cancer de la thyroïde le plus fréquent est le cancer papillaire (51.8%), tandis que le cancer folliculaire a représenté 41,1%. Les cancers médullaires et ana-plastique de la thyroïde sont les moins fréquents. La majorité des patients recensés se trouvaient parmi ceux dont le revenu mensuel est de 10.000-30.000 naira soit (67 \$ - 200 \$).

Le coût moyen du traitement du cancer de la thyroïde après thyroïdectomie totale est de 2500 \$ (N375 000,00) dans ce centre. Seuls vingt et un des 56 patients (37.5%) étaient en mesure de payer 300 \$ pour le diagnostic de tout le corps par le scanner à l'iode tandis que seuls 16 patients sur 21 (28,6%) pouvaient payer 1200 \$ pour le traitement à l'iode radioactif.

Conclusion: Avec le coût moyen du traitement du cancer de la thyroïde qui est plus élevé que le revenu annuel de la majorité des patients soumis à l'étude, il devient impératif qu'une politique d'assurance-maladie se mette en place pour l'accessibilité des soins de cette maladie potentiellement curable dont souffre la plupart des Nigériens.

Introduction

Thyroid malignancy is an uncommon disease with a uniform world incidence of 40 per million, accounts for less than 1% of all malignancies [1].

Although seen from childhood to old age, the peak incidence is the 6th decade in Europe and America and 4th decade in Africa and Asia [1]. This makes the disease a source of concern in Africa where the peak incidence is in the productive age group.

The aetiology of thyroid cancer like many other cancers is unknown but risk factors attributed to the development of thyroid cancer includes; exposure to radiation (e.g. previous neck irradiation), especially in children. Approximately 85% of such irradiation induced tumours are papillary cancer in nature [2]. High dietary iodine intake increases the incidence of papillary carcinoma, whereas low iodine content is goitrogenic and may lead to follicular or anaplastic carcinoma.

Thyroid cancer can be classified into: Differentiated thyroid carcinoma (DTC) (which is sub-classified as; papillary thyroid carcinoma (PTC) 80%, follicular thyroid carcinoma (FTC) 10%, and Hurtle cell carcinoma 3%), anaplastic carcinoma 1%, Medullary thyroid carcinoma (MTC) 5%, Lymphoma 1%, and Metastatic carcinoma <1% [3]. Differentiated thyroid cancer which constitutes more than 85% of all thyroid malignancies is a potentially treatable disease especially if detected early and managed appropriately.

For many years the recommended therapy for DTC, with the exception of micro-carcinoma, is near-total thyroidectomy followed by postoperative remnant radioiodine ablation (RRA) of thyroid tissue. Even though results from randomized controlled trials are just gathering, this combination has proven its worth as a safe and very effective treatment that results in an improved life expectancy and reduced recurrence rate for patients with DTC in many observational studies. A survey from North America [4] reported that majority of physicians are convinced that RRA decreases DTC – related mortality and recurrence, and facilitate DTC follow-up with a low risk of adverse effects.

RRA has been adopted as an integral part of several recent international guidelines for the treatment of DTC, such as those of American Thyroid Association [5], the European Thyroid Association [6] as well as several national guidelines in countries such as the U.K., Germany [7,8].

In clinical practice, RRA treatment has three goals, as summarized by Schlumberge [9]. First, I-131 therapy may destroy occult microscopic cancer foci, thereby decreasing the long-term risk of recurrent disease [10-13]. Secondly, it destroys any remnant

normal thyroid tissue, thereby increasing the specificity of detectable serum thyroglobulin (Tg) and positive whole-body scintigraphy as markers for persistent or recurrent tumour [9,11,14]. Thirdly, the use of a large activity of I-131 for therapy permits post ablative scanning, a test for detecting persistent or metastatic carcinoma [15,16] this procedure also allow precise probe-guided removal of such foci in selected cases [17].

This potentially treatable disease is still elusive to many Nigerian patients who cannot afford the cost of effective management. The standard management for thyroid cancer includes total thyroidectomy followed by serial thyroid function test, whole body iodine diagnostic scan and radioactive iodine RAI ablation therapy, which in some cases may be more than once. The average cost of this procedure is \$2500 (N375 000.00) in Nigeria. This average cost is beyond the reach of majority of indigent Nigerians whose average monthly income is about \$67(N 10000).

This study was aimed at highlighting the incidence, sex distribution, socioeconomic status, type of thyroid malignancy and the percentage of patients that could afford the cost of treatment at this referral centre.

Patients, materials and method

The study is a retrospective review of thyroid cancer patients who were managed since the inception of the Nuclear medicine department in June 2006 to May 2010. A total 56 patients with thyroid cancer were included in the study. The sources of their referral were compiled. The patients were regrouped according to whether they had total or non total thyroidectomy. The non total group was referred to the surgical department for completion thyroidectomy.

Socioeconomic status of the patients were compiled, they were grouped into social class A to E. Social class A comprises of professionals, class B includes graduates of higher institutions that are in senior cadre in the civil service structure while class C includes graduates in junior cadre. Class D comprises of self employed artisans – road side mechanics, iron benders, vulcanizers, tailors e.t.c. Class E comprises cleaners, petty traders, pensioners and dependants.

All the patients had induced hypothyroidism, with TSH \geq 30MIU/L, by withdrawal of daily ingestion of levo-thyroxine and iodine containing foods.

Radioactive iodine (RAI) 131(3-5mCi) was administered to each patient and, 48 hours later whole body iodine (WBI), diagnostic scan was performed using Siemens E-cam. The patients were then scheduled for RAI treatment (100-200mCi) based on the findings from the WBI, diagnostic scan. The

patients were admitted in our iodine therapy ward and discharged when the level of radioactivity was considered safe for the public. They were placed on daily dose of 200 mg of Levo-thyroxine and followed up in our thyroid clinic. These patients were subsequently monitored with thyroid function and thyroglobulin level.

Patients were reviewed again at the 6th month post RAI treatment with whole body Iodine scan and thyroid function test.

Results

Out of the 56 patients managed, 18 (32.1%) were referred from surgery department, while 14 (25%) were from Radiotherapy, two patients (3.6%) were from the Ear Nose and Throat department of the hospital. The remaining 22 patients, (39.3%) were referred from other tertiary hospitals in Nigeria Table 1. A total 20 (35.7%) patients had total thyroidectomy at presentation, while, 36 (64.3%) had sub-total thyroidectomy.

Table 1: Sources of referral

Referral Centre	No. (%)
Surgery Department, UCH, Ibadan	18 (32.1%)
Radiotherapy Department, UCH Ibadan	14 (25%)
ENT Department, UCH Ibadan	2 (3.6%)
Other tertiary Hospital in Nigeria	22 (39)

There is an even spread of incidence of thyroid cancer from 3rd to 7th decade, Table 2. However females are more affected 38 (67.9%) than males 18 (32.1%).

Table 2: Incidence of thyroid cancer

Age range	No. (%)
10 – 19	1 (1.8%)
20 – 29	10 (17.9%)
30 – 39	14 (25%)
40 – 49	10 (17.9%)
50 – 59	8 (14.3%)
60 – 69	9 (16.1%)
70 – 79	4 (7%)

Tables 3 & 4 show the socio-economic status of the patients in which 69.6% of the patients belong to low socio-economic class with an average monthly income of less than \$67 (N10000).

The commonest type of thyroid malignancy seen in our environment is papillary thyroid cancer which accounted for 51.8% of the cases while follicular thyroid cancer accounted for 41.1%. Medullary and Anaplastic thyroid cancers were the

least common, each accounted for 3.6% of all the cases seen Table 5.

Table 3: Literacy Level

Level	Total	Percentage
Literate	22	39%
Semi literate	20	36%
Illiterate	14	25%

Table 4: Social class / Monthly income level of patients

Social class	Average monthly income	Total	Percentages
A	Above \$300 (N45 000:00)	1	1.8%
B	\$300 (N45 000:00)	6	10.7%
C	\$200 (N30 000:00)	10	17.8%
D	\$67 (N10 000:00)	25	44.6%
E	\$47 (N7000:00)	14	25.0%

Table 5: Percentage distribution of thyroid cancer

Types	No. (%)
Papillary	29 (51.8%)
Follicular	23 (41.1%)
Medullary	2 (3.6%)
Anaplastic	2 (3.6%)

Twenty one patients (37.5 %) could afford the cost of diagnostic WBI scan which cost \$300 out of which 10 patients had metastatic spread to the brain, lungs, and skeleton. Finally, out of this 21 patients that had WBI scan only 16 patients (28.6%) could afford the cost of RAI treatment. Table. 6.

Table 6: Percentage distribution of patients that could afford the cost of RAI management

	WBI (%)	RAI (%)
Could afford	21(37.5)	16 (28.6%)
Could not afford	35(63.5)	40 (71.4)

Discussion

The standard of care in management of thyroid cancer is total thyroidectomy followed by ablation of the thyroid remnant with radioactive I- 131. The patient is then followed up with serial thyroid function test

and thyroglobulin assay) (Tg) on and off levo-thyroxine (T4) suppression and WB I scan. Based on findings on follow-up, the patient can be considered cured, thus a better quality of life with increased in life expectancy.

With the burden of cost of treatment solely on the shoulders of patients in this setting, this standard management is still elusive to most of our patients in a resource poor country like Nigeria.

Nigeria is the 20th poorest country in the world [18] in which more than 60% of the population live on \$1.25 per day. 'Socio economic backgrounds of patients seen ranged from illiterate to literate. 25% of our patients are unskilled workers with average monthly income of \$47 (7000:00) while 44.6% are self employed in semi skilled enterprises such – road side auto-mechanic, hair dressing, tailoring and, iron bending with an average monthly income of (\$67) N10 000:00. The remaining 30.4% were government and private institutions employees with an average monthly income of (\$200) N30 000:00

A total of 56 patients were seen during the period under review, only 16 (28.6%) patient were offered RAI ablation treatment post total thyroidectomy due to the cost of treatment. This was largely because the total cost of care for this ailment being N375,000 naira excluding surgery was way beyond the yearly income of majority of the patients.

The socioeconomic class of the patients revealed that only 7 (12.5%) patients were in high socioeconomic class with an average monthly income of \$200(N30 000), while majority of the patients 39 (69.6%) were in low socio economic ladder with monthly average income of less than \$67 (N10000) .

Incidence of thyroid cancer from this study is even from 3rd to 7th decade with peak incidence in 3rd decade. The youngest patient seen was 16 years old while the oldest was 76 years. Female to male ratio is 2:1 which agrees with the findings of El-Haddad in the Egyptian population [19].

Papillary thyroid cancer is the commonest which accounts for 51% of cases, closely followed by follicular cancer 41% and the least were medullary and anaplastic cancers with 3.6% each. This agrees with the incidence all over the world.

With only 16 (28.6%) patients out of 56 seen treated with RAI ablation while the majority 40 (71.4%) could not afford the cost of the treatment which is approximately \$1200 baring the cost of surgery is grossly unacceptable for a country like Nigeria with rich human and material resources. Therefore, it is imperative for the policy makers in Nigeria to consider seriously the issue of health insurance scheme that

will be all encompassing to make this therapy available for all rich or poor bearing in mind that thyroid cancer is one the potentially curable diseases.

Without health insurance a large proportion of our patients will be denied of this benefit, hence the need for a comprehensive health scheme to benefit all and sundry is of urgent priority.

References

1. Badoe EA, Archampong EQ and Jaja MOA. In Principles and Practice of Surgery 4th Ed. Assemblies of God literature centre Ltd. Accra 2009; pg 363.
2. Heidenreich WF, Kenigsberg J, Jacob p, *et al.* Time trends of thyroid cancer incidence in Belarus after the Chernobyl accident. *Radiat Res* 1999; 151:617-625
3. Nguyen MH. Thyroid cancer. Grand rounds Presentation UTMB. 2002; Accessed on April 2008 at: [http:// www.utmb.edu.otofer/Grnds/Thyroid-Ca-021204/](http://www.utmb.edu.otofer/Grnds/Thyroid-Ca-021204/)
4. Sawka AM, Goldstein DP, Thabane L, Brierley JD, Tsang RW, Rotstein L, *et al.* Basis for physician recommendations for adjuvant radioiodine therapy in early-stage thyroid carcinoma: principal findings of the Canadian-American thyroid cancer survey. *Endocr Pract* 2008; 14:175–184.
5. Cooper DS, Doherty GM, Haugen BR, Kloos RT, Lee SL, Mandel SJ, *et al.* Management guidelines for patients with thyroid nodules and differentiated thyroid cancer. *Thyroid* 2006; 16(2):109–142.
6. Pacini F, Schlumberger M, Dralle H, Elisei R, Smit JW and Wiersinga W. European consensus for the management of patients with differentiated thyroid carcinoma of the follicular epithelium. *Eur J Endocrinol* 2006; 154:787–803.
7. Dietlein M, Dressler J, Eschner W, Grünwald F, Lassmann M, Leisner B, *et al.* Procedure guidelines for radioiodine therapy of differentiated thyroid cancer (version 3). *Nuklearmedizin* 2007; 46:213–219.
8. Dietlein M, Dressler J, Eschner W, Grünwald F, Lassmann M, Leisner B, *et al.* Procedure guideline for iodine-131 whole-body scintigraphy for differentiated thyroid cancer (version 3). *Nuklearmedizin* 2007; 46:206–212.
9. Schlumberger MJ. Papillary and follicular thyroid carcinoma. *N Engl J Med* 1998; 338:297–306.
10. Mazzaferri EL and Jhiang SM. Long-term impact of initial surgical and medical therapy on papillary and follicular thyroid cancer. *Am J Med* 1994; 97:418–428.

11. Mazzaferri EL and Kloos RT. Clinical review 128: current approaches to primary therapy for papillary and follicular thyroid cancer. *J Clin Endocrinol Metab* 2001; 86:1447–1463.
12. Tubjana M, Schlumberger M, Rougier P, Laplanche A, Benhamou E, Gardet P, *et al.* Long-term results and prognostic factors in patients with differentiated thyroid carcinoma. *Cancer* 1985; 55:794–804.
13. Simpson WJ, Panzarella T, Carruthers JS, Gospodarowicz MK and Sutcliffe SB. Papillary and follicular thyroid cancer: impact of treatment in 1578 patients. *Int J Radiat Oncol Biol Phys* 1988; 14:1063–1075.
14. Utiger RD. Follow-up of patients with thyroid carcinoma. *N Engl J Med* 1997; 337:928–930.
15. Sherman SI, Tielens ET, Sostre S, Wharam MD Jr and Ladenson PW. Clinical utility of post treatment radioiodine scans in the management of patients with thyroid carcinoma. *J Clin Endocrinol Metab* 1994; 78: 629–634.
16. Tenenbaum F, Corone C, Schlumberger M and Parmentier C. Thyroglobulin measurement and post ablative iodine-131 total body scan total thyroidectomy for differentiated thyroid carcinoma in patients with no evidence of disease. *Eur J Cancer* 1996; 32A:1262.
17. Travagli JP, Cailleux AF, Ricard M, Baudin E, Parmentier C, Schlumberger M, *et al.* Combination of radioiodine (¹³¹I) and probe-guided surgery for persistent or recurrent thyroid carcinoma. *J Clin Endocrinol Metab* 1998; 83:2675–2680.
18. List of countries by percentage of population living in poverty. Accessed in August 2010. Available at: <http://en.wikipedia.org/wiki/>
19. El-Haddad S. Follow-up of differentiated thyroid cancer. *Sci. Med J. ESCME*. 2004; 16(4):61-67