

## Case report

### **HYPERTHYROIDISM IN THE ELDERLY: A CASE REPORT**

#### **ABSTRACT**

**Background:** Thyroid disorders in the elderly commonly occur as hypothyroidism but hyperthyroidism can also occur. Diagnosing thyroid disorders in the elderly can be difficult due to varying factors. Among these is the age related decline of function of organ systems and the presence of morbid conditions in the elderly that often require medications some of which affect thyroid hormone metabolism. Subclinical hyperthyroidism is often the presentation rather than overt hyperthyroidism hence combining the physical presentation and thyroid investigations of an aged patient may be more useful in making effective clinical judgment.

**Aim:** The aim of this case report is to show the variety of ways in which hyperthyroidism can present in the older adult.

**Methods:** Relevant clinical and biochemical data was retrieved from the case notes of 3 older adults who presented with clinical and biochemical evidence of hyperthyroidism to the University of Port Harcourt Teaching Hospital, Port Harcourt, Nigeria from 2015 to 2022

**Conclusion:** Hyperthyroidism in the elderly can present in variety of ways which may be different from the typical way in other age groups. The biochemical findings may not be clear cut in making diagnosis hence the need to acquire the clinical skill in combining the physical manifestations with the thyroid investigations.

**Key Words:** Adult, Elderly, Goiter, Hallucinations, Hyperthyroidism,

#### **Introduction**

Hyperthyroidism in the elderly is a serious clinical condition that is associated with significant morbidity. It may be hard to detect due to the confusing effects of drugs and acute or chronic illnesses on the interpretation of thyroid function tests.<sup>1</sup> The physiological decline that occurs during the aging process can also affect the way the thyroid hormones work in the body. There is increasing evidence that even mild (subclinical) hyperthyroidism in the elderly is associated with risks such as atrial fibrillation and other cardiovascular complications.<sup>1-4</sup> In the elderly each organ system's function declines at different physiologic rate and because 75% of the elderly have at least one disease, endocrine dysfunction in the elderly often presents disparately, with initial symptoms derived from the most compromised organ system.<sup>5</sup> The symptoms presented by

the older adult can be variable and may not fit into the classical presentation. For instance, hyperthyroidism in an elderly patient with preexisting coronary and conduction system disease may present with atrial fibrillation and a slow ventricular response; while in another equally hyperthyroid patient with a prior stroke it may present with confusion or depression. These patients may not tolerate hyperthyroidism long enough for the classic thyroid-related manifestations (e.g. goiter) to become apparent.<sup>2-5</sup> Also, elderly patients often have multiple diseases and take many medications that may mimic or mask the usual presentation of endocrine disease.<sup>2, 3, 5</sup> In Nigeria the exact prevalence of hyperthyroidism is unknown and there has been very little focus on this area. Thyroid dysfunction in the elderly is commonly manifested as hypothyroidism however older adults can develop hyperthyroidism for the first time ever.<sup>2-5</sup> The prevalence of hyperthyroidism in the elderly worldwide is approximately 0.5-3%, of which 10-15% of hyperthyroid patients are above 60 years of age.<sup>2, 6</sup> These case reports would serve as a stimulating focus of interest on this topic.

### Case reports

**Case 1:** We report a 60 year old woman referred on account of tremors of 8 months duration. Tremors involved the entire body but worse in the upper limbs and worsened by activity such as stretching out of hands, noticed even while at rest. There was associated heat intolerance, palpitations, chest pain, dyspnoea, but no cough. Patient had an anterior neck swelling with bulging of the eyes associated with grittiness. There was associated hoarseness of voice but no dysphagia or odynophagia. She had unintentional weight loss though with normal appetite but no history of hyper defecation or constipation. She had been a known hypertensive patient for the past 10 years with poor adherence to medication and on management of peptic ulcer patient for past three years. She had a spinal cord decompression a year prior following as a road traffic accident. She uses iodized salt for cooking, takes anti-hypertensives and occasionally analgesics as her usual medications. She had no known drug allergies. She was post-menopausal. There is no family history of thyroid disease, hypertension, and sickle cell disease. She does not take alcohol or use tobacco product in any form.

On examination she was an elderly woman in no obvious distress, anicteric, afebrile acyanosed, with no peripheral lymphadenopathy. She had bilateral pitting pedal oedema up to upper 1/3<sup>rd</sup> of the leg and tremors of the hand. She had an anterior neck mass, which moved with swallowing but not with tongue protrusion) not differentially warm, non-tender and not attached to overlying skin or underlying structures. Her PR was 88bpm of full volume and regular with thickened arterial wall. Her BP was 170/90mmhg, precordium was active, her apex beat was at 6<sup>th</sup> left intercostal space at mid-clavicular line. She was well oriented in time place and person, she had exaggerated plantar reflex. Results of TFT showed elevated thyroid hormones as shown in Table 2 below. A diagnosis of hyperthyroidism was made. She was counselled on her condition, investigated accordingly referred to the ophthalmologist. She was commenced on anti-thyroid medication (carbimazole) following review of her thyroid function test result. The symptoms have gradually regressed and she is still on follow up at the Endocrine clinic.

**Case 2:** A 68 year old woman, recently diagnosed diabetic who was referred to endocrinology clinic on account of neck swelling of 3 years duration. Swelling was gradual in onset, painful and progressively increasing in size. There was a history of weight loss, anorexia, palpitations and heat intolerance. There was no associated dysphagia, difficulty in breathing, change in her voice. No tremors, fevers, alopecia, dry skin, muscle weakness or bulging eyes. She was post-menopausal. She took herbal medication and alcohol to reduce symptoms however symptoms persisted. She is recently diagnosed to be living with diabetes and had commenced therapy with lifestyle modification and dietary changes. She made use of iodized salt and consumed cabbage in moderate quantity. There was no history of similar illness in any family member. She had a past history of tobacco (snuff) and significant alcohol intake. On examination she had no obvious abnormality on general physical signs except for palmar and plantar melanosis. She had an obvious anterior neck swelling moves with swallowing, no change in the overlying skin with no differential warmth measuring about (but not with tongue protrusion), tender, with no differential warmth or change in skin colour, measuring about 6x5cm not attached to the overlying skin or underlying muscle. There were no eye signs. She had tachycardia with HR of 101bpm full volume and regular, elevated blood pressure (160/90mmHg) with a heaving apex beat at 5 left intercostal space, mid clavicular line. A clinical diagnosis of secondary hyperthyroidism was made to rule out sub-acute thyroiditis. Patient was placed on anti-hypertensives-rampril and amlodipine, carbimazole 10 mg b.d. Ultrasound showed she had colloid goiter and her electrocardiogram reading was normal.

### Case 3

This is a case report of an 82 year old woman who was apparently well until 1 month ago prior to presentation at the clinic when she developed sudden restlessness. There was associated generalized headache, difficulty in sleeping and visual hallucinations with heat intolerance. There was low grade fever which resolved with intake of Paracetamol and antimalarial drugs. She was not a previously known hypertensive or diabetic. There was positive family history of hypothyroidism in her daughter. On examination she had no obvious neck swellings but she had tachycardia and her blood pressure ranged between systolic 160- 180mmHg and diastolic of 80- 85mmHg. Her skin was noted to be warm and moist; with some hypopigmented macules on her forearm. Her TSH was normal with elevated total T3 and T4 levels. The diagnosis of hyperthyroidism with pityriasis versicolor was made. She was placed on carbimazole for two months and propranolol. She was given 2% ketoconazole shampoo. Her symptoms resolved and the TFT became normal. She is still being managed for hypertension and is on regular follow up at the geriatric clinic with TFT still within normal limits.

**Table 1: Results of investigations**

	Investigations								
	Hb g/dl	WBC x 10 <sup>9</sup> /L	Platelets x 10 <sup>9</sup> /L	ESR mm/hr	FBG mmol/L	HbA <sub>1</sub> C %	FLP	S/E/U	CXR
Case 1	10.8(N)	11.3(N)	217(N)	9(N)	8.0(↑)	6.9(↑)	↑TG	Normal	HHDx
Case 2	12.5(N)	8.4(N)	173(N)	12(N)	5.8(N)	8.0(↑)	Normal	Normal	HHDx
Case 3	13(N)	6.7(N)	170(N)	5(N)	4.8(N)	5.6(N)	Normal	Normal	Normal

*CXR-Chest x-ray, ESR – Erythrocyte sedimentation rate, FBG- Fasting blood Glucose FLP- Fasting lipid profile, Hb- Haemoglobin, HbA<sub>1</sub>C-Glycated haemoglobin HHDx- Hypertensive heart disease, S/E/U-Serum electrolyte urea and creatinine, TG –Triglycerides, , WBC – White blood cell count , ↑-Increased, ↓-decreased, N-Normal*

**Table 2: Investigations: Thyroid Function Tests**

	T3ng/ml (6-1.9)	T4 µg/dl (4.8-12.0)	Free T3pmol/l (1.4-6.0)	FreeT4pmol/l (4.0-15.0)	TSH µiu/ml (0.4-6.8)	Thyroid ultrasound scan
Case 1	4.6(↑)	27.8(↑)	5.6(N)	2.9(↓)	0.02(↓)	Multi-nodular goiter
Case 2	2.4(↑)	15(↑)	7.4(↑)	17.5(↑)	0.01(↓)	Colloid goiter
Case3	3.2(↑)	17.0(↑)	-	-	0.4(N)	Normal size thyroid

## DISCUSSION

These case reports shown a variety of ways in which hyperthyroidism can present in the older adult and the management they received. All the patients were females, which is not surprising as overt hyperthyroidism and subclinical hyperthyroidism is commoner in females as seen in other studies.<sup>2, 4</sup> The first case presented with tremors. It is a known fact that tremors are typical symptoms of hyperthyroidism particularly that due to Grave's disease.<sup>2,7,8</sup> There are other causes of movement disorder in hyperthyroidism however the pathophysiology of these movement disorders is not well understood.<sup>8</sup> The tremors improved following treatment just as reported by Delhase et al in a 60 year old woman who had a more erratic movement disorder and Sharma in an 89 year old woman who had tremors.<sup>8, 9</sup> The second case presented with anterior neck swelling which is an obvious physical symptom and sign of thyroid disease which could either be hyperthyroidism, hypothyroidism or euthyroid state characteristic of endemic goiter.<sup>2, 5, 10</sup> The third case showed an elderly woman who presented with restlessness and visual

hallucinations. Hyperthyroidism has been known to be associated with agitation, anxiety, apathy, cognitive impairment, delirium, depression, fatigue, irritability, impaired memory, insomnia and even motor inhibition.<sup>4, 11, 12</sup> Psychotic features including delusional psychosis which is a form of tactile hallucinations has been reported in hyperthyroidism regardless the age.<sup>12, 13</sup> There were other clinical manifestations seen in these patients as expected in hyperthyroidism such as bulging of eyes (ophthalmopathy), hoarseness of voice and heat intolerance. The presence of comorbidities in the patients was noted. The first patient already had a history of hypertension a decade prior to presentation. The poor compliance to medication made her have uncontrolled blood pressure. This history is important to note because hyperthyroidism can manifest with cardiovascular disease including secondary hypertension.<sup>3, 5, 6</sup> She was also noted to be diabetic following her results as seen in Table 1. The second patient was not a known hypertensive prior to presentation but was a known diabetic on medication but was found to have hypertension on examination. The actual cause of the hypertension may not be understood; being an older person, having diabetes and the hyperthyroidism are all factors that could predispose to hypertension. Age and having hyperthyroidism can also be the factors for hypertension in the third patient. In an observational cohort study done amongst Danish hyperthyroid patients it was found out that hyperthyroid individual had a significantly higher risk of being diagnosed with cardiovascular diseases, lung diseases and diabetes mellitus but not with malignant diseases prior to the diagnosis of hyperthyroidism. After the diagnosis of hyperthyroidism, subjects had a significantly higher risk of being diagnosed with cardiovascular diseases, lung diseases, and diabetes mellitus but not with rheumatic diseases, or malignant diseases.<sup>14</sup> The possible explanation are the hemodynamic changes, endothelial dysfunction and coagulopathy seen in hyperthyroidism that are predisposing factors to cardiovascular diseases. The hypermetabolic state and hyperthyroid myopathy affect cardiopulmonary performance hence causing lung diseases indirectly.<sup>14</sup> Autoimmune disorders like diabetes mellitus type 1, rheumatic diseases and Graves' disease seem to cluster in some patients which may result from shared genetic risk factors.<sup>14</sup> Skin co-morbidities are not as common with hyperthyroidism as compared to hypothyroidism however they can occur.<sup>15, 16</sup> Cutaneous manifestations of thyroid disease is one of the first notable signs of thyroid hormone dysregulation.<sup>17</sup> The noted skin changes seen in hyperthyroid patient are warm moist skin as seen in the third patient and exophthalmos (bulging eyes) which was seen in the second patient. Diffuse non-scarring alopecia, palmoplantar hyperhidrosis, facial flushing, skin hyperpigmentation, thyroid acropachy, pretibial myxedema and nail changes like onycholysis and Plummer's nails are other manifestations.<sup>16, 17, 18</sup> Drug reactions used in managing hyperthyroidism can also cause cutaneous changes. Carbimazole which was used in all three cases have been reported to cause acute urticaria, aplasia cutis in newborns and DRESS (Drug Rash with Eosinophilia and Systemic Symptoms).<sup>17, 18</sup> There were no complaints of any adverse drug reaction following treatment with carbimazole in any of the patients. Propylthiouracil which is another anti-thyroid drug is also known to cause skin rash such as purpura and ANCA (Antineutrophilic cytoplasmic antibody associated) vasculitis.<sup>19</sup> Treatment has known to be beneficial even in those with subclinical hyperthyroidism as it was in

done in the third case. The patient showed evidence of cognitive impairment as characterized by visual hallucinations and was diagnosed as hypertensive for the first time. Commencement of carbimazole improved her clinical state with resolution of symptoms and signs as previous studies have shown.<sup>2, 3, 4, 14</sup> Treatment of subclinical hyperthyroidism or symptomatic older adults with unclear thyroid function tests requires sound clinical judgment on the part of the physician in other not to cause more harm.<sup>20</sup> **Individualized treatment is usually advised in the elderly using radiotherapy as it preferred or anti thyroid drugs as it was done in this case report.<sup>1</sup> Prognosis is excellent if treatment is instituted immediately as the consequences of untreated subclinical hyperthyroidism or overt hyperthyroidism can be life threatening as this case report has shown.<sup>1, 3</sup>**

### **Conclusion:**

Hyperthyroidism in the elderly can present in variety of ways which may be different from the typical way in other age groups. The biochemical findings may not be clear cut in making diagnosis hence the need to acquire the clinical skill in combining the physical manifestations with the thyroid investigations.

### **REFERENCES**

- 1) Samuels MH. Hyperthyroidism in Aging. [Updated 2021 Aug 9]. In: Feingold KR, Anawalt B, Blackman MR, et al., editors. Endotext [Internet]. South Dartmouth (MA): MDText.com, Inc.; 2000-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK278986/> Accessed (02-02-2024)
- 2) Madhuvan, H.S, Ravishankar, S.N, Somashekar R., Chandrasekhara, P., Nikhil, D., A prospective study of thyroid dysfunction in elderly patients and its Clinical correlation, Archives of Medicine, 2013, 5(2): 1-11
- 3) Parle, JV, Maisonneuve, P., Sheppard, MC, Boyle, P., Franklyn, JA, Prediction of all cause and cardiovascular mortality in elderly population from one low serum thyrotropin result: a 10 year cohort study, Lancet, 2001, 368: 861-865
- 4) Juárez- Cedillo, T., Basurto- Acevedo, L., Vega- García, S. Sánchez- Rodríguez, MA Retana- Ugalde, R., Juárez- Cedillo, E. Prevalence of thyroid dysfunction and its impact on cognition in older Mexican adults: (SADEM) study, J Endocrinol Invest, 2017
- 5) **Greenspan's Basic & Clinical Endocrinology, Gaedner, DG, Shoback, D. (ed) 10th Edition, McGraw- Hill, 2018 : 190**
- 6) Boelaert, K., Torlinska, B., Holder, RL, Franklyn, JA. Older Subjects with Hyperthyroidism Present with a Paucity of Symptoms and Signs: A Large Cross-Sectional Study, The Journal of Clinical Endocrinology & Metabolism, 2010; 95(6):2715–2726,
- 7) Ajish TP, Jayakumar RV. Geriatric thyroidology: an update. Indian J Endocrinol Metab. 2012;16:542–547

- 8) Delhasse S, Debove I, Arnold-Kunz G, Ghika JA, Chabwine JN. Erratic movement disorders disclosing Graves' disease and paralleling thyroid function but not autoantibody levels. *J Int Med Res.* 2019 Mar;47(3):1378-1386.
- 9) Sharma P. The Unlikely Suspect: A Case Report of New-Onset Hyperthyroidism Due to Graves' Disease in an 89-Year-Old Gentleman and Review of Literature. *Cureus.* 2022 Jan 24;14(1):e21546.
- 10) Chuhwak E, Ohwovoriolae AE. Clinical features of goitres on the Nigerian Plateau. *Niger Postgrad Med J.* 2005 Dec;12(4):245-9.
- 11) Marian G, Nica EA, Ionescu BE, Ghinea D. Hyperthyroidism--cause of depression and psychosis: a case report. *J Med Life.* 2009 Oct-Dec;2(4):440-2 Kothari, S., Townsend, W., Chaudhry, Z. et al. Psychosis secondary to thyrotoxicosis that persisted post-thyroidectomy: a case report. *BMC Psychiatry;* 2023: 23, 750 .
- 12) Adediran KI, Alapati D, Rasimas JJ. Delusional psychosis in Graves' disease. *Prim Care Companion CNS Disord.* 2018;20(1):17102145.
- 13) Ozten E, Tufan AE, Cerit C, Sayar GH, Ulubil IY. Delusional parasitosis with hyperthyroidism in an elderly woman: a case report. *J Med Case Rep.* 2013 Jan 10;7:17.
- 14) Brandt F, Thvilum M, Almind D, Christensen K, Green A, Hegedüs L, Brix TH. Morbidity before and after the diagnosis of hyperthyroidism: a nationwide register-based study. *PLoS One.* 2013 Jun 20;8(6):e66711
- 15) Narwade, S. D., & Barve, R. M. (2020). Assessment of comorbidities in patients with deranged thyroid hormone levels. *International Journal of Basic & Clinical Pharmacology,* 9(7), 1044–1049.
- 16) Puri N. A study on cutaneous manifestations of thyroid disease. *Indian J Dermatol.* 2012 May;57(3):247-8
- 17) Cohen, B. Cadesky, A., Jaggi S, Dermatologic manifestations of thyroid disease: a literature review, *Front. Endocrinol.,* 12 May 2022 Sec. Thyroid Endocrinology Volume 14 – 2023
- 18) Kalus, AA, Chien, AJ, Olerud, JE Diabetes and other Endocrine diseases. Fitzpatrick Dermatology in General Medicine 7th ed. In Wolff K et al ed. New York, McGraw-Hill, 2012; 1471-1473
- 19) Almeida M S, Ramalho C, Gomes F, et al. (July 20, 2022) Propylthiouracil-Induced Skin Vasculitis. *Cureus* 14(7): e27073.
- 20) Gharib, H, Jasim, S. Thyroid and Aging, *Endocrine Practice* Rapid electronic Article in Press , 2017, DOI: 10.4158/EP171796.RA

**NOTE: Those in yellow are to be deleted; those in red are to be added**