

Hyperthyroidism in elderly patients

Hyperthyroidism is more common in young adulthood and middle age; approximately 10% to 15% of hyperthyroidism occurs in people age 60 years and older. Hyperthyroid conditions affect 2% of women and 0.2% of men. Thyroid laboratory tests should be ordered for all patients with the classic symptoms of hyperthyroidism, elderly people with apathetic symptoms of uncertain etiology, all people admitted to geriatric care units, and elderly people with atrial fibrillation.¹

As with many diseases that occur in older people, the signs and symptoms of hyperthyroidism often are nonspecific and have an atypical presentation. Hyperthyroidism can be confused with other diseases attributed to old age. The physiologic presentation of true thyroid disease often focuses on the most compromised organ system (ie, the cardiovascular system) and because older people have several chronic diseases, the symptoms of hyperthyroidism may be hidden.²

GRAVE'S DISEASE

Although the prevalence of multinodular goiter and toxic nodules increases with age, Grave's disease is the most common cause of hyperthyroidism in older people. Grave's disease is approximately eight times more common in women than in men. It occurs more commonly in the third to fifth decade of life but can occur at any age.³ The exact

etiology of Grave's disease is not known; however, it is closely associated with autoimmune abnormalities. Under the influence of one or more immunoglobulins, the thyroid gland becomes diffusely enlarged and produces excessive amounts of thyroxine (T_4) and triiodothyronine (T_3). Although both hormones may be overproduced in mild or early cases, T_3 excess may be common.⁴

Older people with hyperthyroidism may have many of the usual signs and symptoms found in younger people (Table 1).⁵ Resting tachycardia, lid lag, and ophthalmopathy are uncommon in older adults.⁶ Older people also may present with absent or atypical thyroid symptoms (Table 2).⁷ Approximately 25% to 40% of older people display an altered presentation called apathetic thyrotoxicosis. These people present with anorexia and weight loss, apathy and lassitude, depression, confusion, and constipation. In addition, there may be increased angina in people with known coronary artery disease, newly onset or recurrent atrial fibrillation, dyspnea and fatigue, and congestive heart failure. Peripheral manifestations include claudication and poor tissue healing.⁸

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PHYSIOLOGIC OVERVIEW

Thyroid hormone secretion is controlled through a negative feedback mechanism. The thyroid gland is controlled by the thyroid-stimulating hormone (TSH) that is secreted in the anterior pituitary gland. The TSH is released in response to stimulation by the hypothalamic hormone, called thyrotropin-releasing hormone. As thyroid hormone levels drop, TSH stimulation is increased, which prompts increased secretion and release of thyroid hormones. After hormone levels reach normal levels, TSH secretion is depressed, and thyroid hormone secretion decreases.⁹

The thyroid gland produces three hormones— T_4 , T_3 , and calcitonin, a hormone involved in calcium metabolism. The principle hormone secreted by the thyroid gland is T_4 , but most of it is deionated to T_3 for use in the cells. After they are released into the blood, thyroid hormones are bound primarily to a transport hormone called thyroxine-binding globulin; smaller amounts of thyroid hormone are bound to albumin and thyroxine-binding prealbumin. Only a small amount of both hormones are free (ie, unbound). This is important because only the free fractions of these hormones can produce the necessary physiologic and metabolic effects.¹⁰

THYROID STUDIES

There are many laboratory tests to measure thyroid function, but no single test can confirm or

rule out thyroid disease. Many health care facilities can run newer tests; however, other health care facilities rely on older thyroid tests. Tests routinely ordered include T_4 , T_3 , T_3 resin uptake (T_3RU), and TSH, which usually are sufficient to diagnose most cases of hyperthyroidism (Table 3).¹¹ In some cases, radioactive iodine uptake testing using ^{123}I is used to differentiate the cause of the patient's hyperthyroidism. Keep in mind that certain medications may affect thyroid hormone levels. The diagnosis of hyperthyroidism is confirmed with an elevated T_4 , T_3 , or T_3RU , or a low or undetected TSH.¹²

MANAGEMENT OF GRAVE'S DISEASE

Treatment of Grave's disease includes surgery, antithyroid medications, and radioiodine and beta-adrenergic blocking agents. Of the different types of treatment, radioiodine, specifically ^{131}I , is a simple, inexpensive, and effective therapy for adults, especially for older patients. Patients generally become euthyroid within six to 12 months after treatment. Regular follow-up is essential because hypothyroidism gradually develops in approximately 80% of older patients who are adequately treated with radioiodine. When laboratory tests confirm low thyroid hormone levels, thyroid hormone replacement therapy should begin. Also, after thyroid levels fall to within normal limits, the clearance rates of other medication may decrease, requiring physicians to adjust other medications the patient may be taking.¹³

Antithyroid medications (eg,

Table 1
SIGNS AND SYMPTOMS OF HYPERTHYROIDISM—YOUNG AND MIDDLE ADULT¹

Symptoms	Signs
Hyperactivity	Restlessness
Nervousness	Tachycardia or arrhythmia
Irritability	Systolic hypertension
Palpitations	Hyperreflexia
Heat intolerance	Tremor
Increased appetite	Stare
Fatigue	Eyelid retraction
Weight loss	Goiter
Weakness	Muscle weakness
Frequent defecation	Warm, moist, smooth skin
Menstrual abnormalities	

NOTE

1. R S Watts, "Hyperthyroidism," in *Saunders Manual of Medical Practice*, first ed, R E Rakel, ed (Philadelphia: W B Saunders, 1996) 638-641.

Table 2
ATYPICAL PRESENTATION OF HYPERTHYROIDISM IN THE OLDER PATIENT¹

Apathy, restlessness	Weakness
Constipation	Anorexia, weight loss
Absence of thyroid changes	Angina
Atrial fibrillation	Congestive heart failure
Absence of eye, skin changes	

NOTE

1. J W Kennedy, J F Caro, "The ABCs of managing hyperthyroidism in the older patient," *Geriatrics* 5 (May 1996) 22-32.

propylthiouracil, methimazole) inhibit thyroid hormone synthesis by interfering with iodine metabolism. Propylthiouracil also inhibits the conversion of T_4 to T_3 . These medications can cause adverse reactions. The most serious adverse reaction is agranulocytosis, which is reversible if the medication is stopped immediate-

ly after suppression is noted. Patients should be cautioned to immediately discontinue antithyroid medications and report a fever of more than 101^o F (38.33^o C) until the patient's neutrophil count is checked to rule out agranulocytosis. Antithyroid medications are not used routinely with older patients because

remission of Grave's disease occurs less than 50% of the time.¹⁴

Surgical intervention is used rarely, even for younger patients. Surgery almost never is considered an option for older patients, except in cases in which the thyroid gland is compressing the structures in the neck because this is associated with increased mortality.¹⁵

Beta-andrenergic blockers (eg, propranolol) may be prescribed to decrease beta-adrenergic-mediated effects of thyrotoxicosis and to decrease the peripheral conversion of T₄ to T₃. Side effects of propranolol include bradycardia, decreased cardiac output, and depression. Beta-blockers are contraindicated in people with bronchospasm or uncompromised heart failure. Other medications may be prescribed, depending on other chronic conditions that need to be stabilized.¹⁶

OTHER CAUSES OF HYPERTHYROIDISM

There are several other causes of hyperthyroidism. Exogenous estrogens increase thyroxine-binding globulin levels, which increases total serum T₄ levels, but the free T₄ levels and TSH levels will be normal. Acute psychiatric disorders may increase thyroxine levels through TSH stimulation via the hypothalamic-pituitary axis. Elderly people may be taking their thyroid medication incorrectly or may be taking thyroid medication prescribed by another physician for other health conditions (eg, obesity). Other elderly patients still may be taking old, desiccated thyroid preparations that have variable hormone content. All of these factors need to be considered as a cause of hyperthyroidism.¹⁷

PREOPERATIVE ASSESSMENT AND INTERVENTIONS

All elderly surgical patients should be evaluated for this disorder because the incidence of hyperthyroidism is greater than once thought. Check the patient's chart for thyroid function studies. Remember that there are different testing methods and different measurements. These variations are confusing. The best way to evaluate a patient's laboratory values is to check the laboratory forms used in the health care facility and the normal values listed for these tests. If the thyroid studies are within normal limits, no further assessment or intervention is needed.¹⁸

If thyroid studies are abnormal, consider the following—has

the patient been ill for some time before his or her surgery? The abnormal values may be caused by the illness and will correct themselves after the patient recovers, in which case no thyroid medication is needed. Although most elderly people with hyperthyroidism should have their thyroid disorder corrected before any surgical procedure is considered, emergency surgery may be necessary. These patients may have significant nutritional impairment and weight loss and are at significant risk for pressure ulcers. Assess the general condition of the patient's skin and use gel pads and other forms of padding to protect fragile skin and prevent pressure ulcers.¹⁹

Table 3

THYROID FUNCTION TESTS¹

Test	Range
Free thyroxine (T ₄) [*]	0.2 to 2.0 ng/dl
Total T ₄ ^{**}	80 to 180 ng/dl
T ₃ resin uptake (T ₃ RU) [†]	25% to 35%
Free triiodothyronine (T ₃)	2.2 to 7.2 pmol/L
Thyroid-stimulating hormone (TSH) [‡]	0.4 to 5.0 mIU/L
Sensitive—TSH [§]	0.4 to 8.0 mIU/L

^{*}"Gold standard" of free T₄ assays.

^{**}Measures all T₄, calculated by multiplying T₃RU by total T₄, corrects for variation in plasma proteins.

[†]Indirect measurement of thyroxine-binding globulin; the product of total T₄ and T₃RU will give the free T₄ index.

[‡]Conversion TSH measures lower levels of detection, 1 u U/mL.

[§]More sensitive TSH levels (more sensitive test than typical TSH).

NOTE

1. J Wallach, *Interpretation of Diagnostic Tests*, fifth ed (Boston: Little, Brown, and Co, 1992) 22, 445-446.

These patients may develop atrial fibrillation and are at risk for congestive heart failure. Assess heart rate and rhythm, prominence of the jugular veins, pitting edema of the lower extremities, and ability to lie flat without shortness of breath. Also, assess for auscultate breath sounds and presence of rales, especially in the bibasilar region of the lungs. These clinical manifestations must be reported to the

surgeon and anesthesia care provider.²⁰

Finally, consider that these patients may be somewhat confused and may have difficulty following directions. You may need to speak slowly and repeat your statements several times. Also, assign a staff member to stay with the patient while preparations for the surgical procedure are underway to prevent any injuries or falls.²¹

SUMMARY

Hyperthyroid disorders occur in older people and often are present with atypical findings or as apathetic hyperthyroidism. Hyperthyroidism exacerbates underlying chronic disease, especially cardiovascular conditions. Elderly people can be treated successfully and stabilized with careful screening, astute diagnostics, and appropriate therapy. ▲

NOTES

1. J W Kennedy, J F Caro, "The ABCs of managing hyperthyroidism in the older patient," *Geriatrics* 51 (May 1996) 22-32.
2. R J Ham, P D Sloane, *Primary Care Geriatrics: A Case-Based Approach*, third ed (St Louis: Mosby-Year Book, Inc, 1997) 30-32.
3. Kennedy, Caro, "The ABCs of managing hyperthyroidism in the older patient," 24.
4. *Ibid.*, 24-25.
5. R S Watts, "Hyperthyroidism," in *Saunders Manual of Medical Practice*, first ed, R E Rakel, ed (Philadelphia: W B Saunders, 1996) 638-641.
6. Kennedy, Caro, "The ABCs of managing hyperthyroidism in the older patient," 24-25.
7. *Ibid.*, 24.
8. Watts, "Hyperthyroidism," 638-639.
9. K Kemle, K Shiffert, S Ayachi, "Thyroid disorders

- in the adult," *Physician Assistant* 20 (May 1996) 22-30.
10. *Ibid.*, 24.
11. J Wallach, *Interpretation of Diagnostic Tests*, fifth ed (Boston: Little, Brown, and Co, 1992) 22, 445-446.
12. Kennedy, Caro, "The ABCs of managing hyperthyroidism in the older patient," 23.
13. Watts, "Hyperthyroidism," 636-640.
14. Kennedy, Caro, "The ABCs of managing hyperthyroidism in the older patient," 23-24.
15. *Ibid.*
16. Watts, "Hyperthyroidism," 638-639.
17. Kennedy, Caro, "The ABCs of managing hyperthyroidism in the older patient," 24-25.
18. *Ibid.*
19. *Ibid.*
20. Ham, Sloane, *Primary Care Geriatrics: A Case-Based Approach*, 30-32.
21. *Ibid.*

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Participants will receive two types of scan sheets in their *Congress Resources* at Congress—session evaluation and session attendance verification. The session evaluation scan sheet is an anonymous way to evaluate each session attended. Six sessions may be evaluated per sheet. Participants must write the session number and darken the bubble that matches the written number. To prevent errors, participants must do this with care. Completed session evaluations may be placed in the scan containers when the sheet is completed. According to Iowa Board of Nursing approved provider continuing education rules and regulations, participants who hold an RN license from the state of Iowa may send their session evaluations directly to the Iowa Board of Nursing.

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