

# Hyperthyroidism and Urinary Incontinence: A Case of Unique Association

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## ABSTRACT

Urinary incontinence predominantly affects females and can be a manifestation of many disorders. Some common aetiologies and risk factors of urinary incontinence include obesity, multiparity, urinary tract infections, smoking, and genital prolapse, etc. Hyperthyroidism, an endocrine disorder, is an uncommon but the potential cause of urinary incontinence. Prior reports of bladder dysfunction or incontinence in hyperthyroid individuals are scant. We delineate a case of a middle-aged female who presented with urinary incontinence along with sweating and body aches. Her examination and initial laboratory work-up were unremarkable, but further evaluation confirmed Graves' disease with associated urge incontinence. Her symptoms initially began to improve after the initiation of antithyroid drugs but recurred after discontinuation of the treatment. This article aims to add knowledge to the current literature and highlight the likelihood of such an unusual association. Physicians should be mindful of this fact and evaluate thyroid function, wherever appropriate, in patients presenting with urinary incontinence.

**Key Words:** Hyperthyroidism, Urinary incontinence, Graves' disease, Thyroid disease, Bladder symptoms.

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## INTRODUCTION

Hyperthyroidism is an endocrine disease in which the thyroid gland produces and releases more T4 and T3. It is classified as primary and secondary. Its prevalence is 1.3%, affecting more women than men.<sup>1</sup> Among the primary hyperthyroidism, Graves' disease, toxic multi-nodular goiter, and toxic adenoma are the most frequent causes.<sup>2</sup> Palpitations, weight loss, heat intolerance, sweating, and nervousness are common symptoms of hyperthyroidism. It can also cause lower urinary tract symptoms.<sup>3</sup> However, its presentation in the form of urinary incontinence is rarely reported. Herein, we present a unique case of hyperthyroidism presenting as urinary incontinence in a young female.

## CASE REPORT

A 42-year married but nulligravid female presented with complaints of urinary incontinence, generalised body aches, and sweating for two months. Her blood pressure was 140/90 mmHg and pulse rate was 110 beats/minute. She was afebrile.

On examination, the skin was warm, and she had a fine hand tremor. The systemic review was unremarkable. She was admitted for further management and was advised to keep a urinary diary. The possibility of stress incontinence was ruled out as no dribbling was reported with coughing or weight-lifting. Furthermore, normal neurologic examination and the absence of any neurologic disorder helped to exclude overflow incontinence. She would experience a frequent desire to urinate and, at times, could not make it to the bathroom, so urge incontinence was diagnosed. A gynaecologic assessment was done that showed no evidence of uterine or vaginal prolapse.

Routine blood tests and urinalysis were advised that are summarised in Table I.

In the context of some of the findings (warm and sweaty skin, tachycardia), thyroid function tests (TFTs) were ordered, and the results were consistent with primary hyperthyroidism (Table I). A Technitium 99m Perchnetate thyroid scan revealed diffusely increased uptake in both thyroid lobes (Figure 1). As a result, a diagnosis of diffuse toxic goiter (Graves' disease) was made. Confirmatory urodynamic studies were performed that showed an overactive bladder with increased detrusor and vesicle pressures, urine leakage, and early and persistent desire to void (Figure 2). She was advised 15 mg of tablet carbimazole and 40 mg of propranolol, both three times daily. A marked improvement in symptoms with good continence was noted within one month of the therapy.

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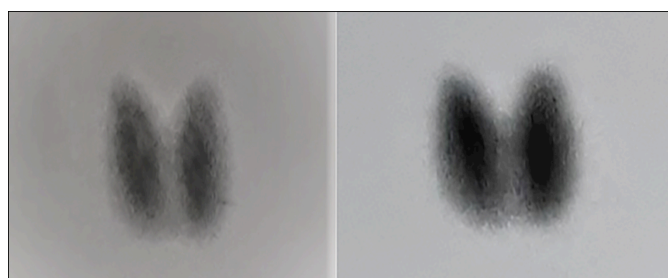
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**Table I: Serum and urinalysis results.**

Laboratory investigations		Reference values	Patient values
Serum investigations	WBC (Cells/mm <sup>3</sup> )	4-11	5.4
	Haemoglobin (g/dL)	11.5-17.5	11.9
	Sodium (mmol/L)	135-50	141
	Potassium (mmol/L)	3.5-5.1	4.4
	Random blood glucose (mg/dL)	70-140	83
	Total Bilirubin (mg/dL)	0.1-1.0	0.43
	ALT (U/L)	10-50	45
	ALP (U/L)	35-104	155
	Blood urea (mg/dL)	10-50	30.1
	Creatinine (mg/dL)	0.42-1.06	0.43
Urinalysis	Glucose	Negative	Nil
	pH	5.0-7.0	5.0
	Protein	Negative	Nil
	Pus cells/WBCs	0-5/HPF	2-3
	Bacteria	Negative	Nil
Thyroid function tests	Free T4 (pmol/L)	10-28	62.26
	Total T3 (nmol/L)	0.6-2.0	5.3
	TSH ( $\mu$ U/ml)	0.3-4.2	0.024



**Figure 1: Thyroid scanning with Technitium 99m Pertechnetate. (a) Shows a normal thyroid scan for comparison; (b) is thyroid scan of the patient which shows diffusely increased radiotracer activity in both thyroid lobes.**

Unfortunately, she missed her next follow-up visit and showed up after four months with the return of urinary incontinence, with additional complaints of diarrhoea, weight loss, and anxiety. She disclosed that she had stopped her antithyroid drugs (ATDs) one month ago due to headaches and nausea. Her TFTs showed a primary hyperthyroid state. The ATDs were reinstituted, and a close follow-up was emphasised.

## DISCUSSION

Lower urinary tract symptoms (LUTs) are possible but with significantly underreported complaints of hyperthyroid states. This association is very rare, and only a few cases have been described so far in the literature. The manifestations can vary and include urinary frequency (most common), urgency, urge incontinence, nocturia, and enuresis.<sup>4</sup> Hyperthyroidism-induced bladder dysfunction is thought to be caused by various mechanisms. First, excess thyroid hormones increase tissue sensitivity to catecholamines and cause an imbalance in the autonomic supply to the bladder, with a predominance of sympathetic activity that leads to dysregulation of the micturition reflex.<sup>5</sup>

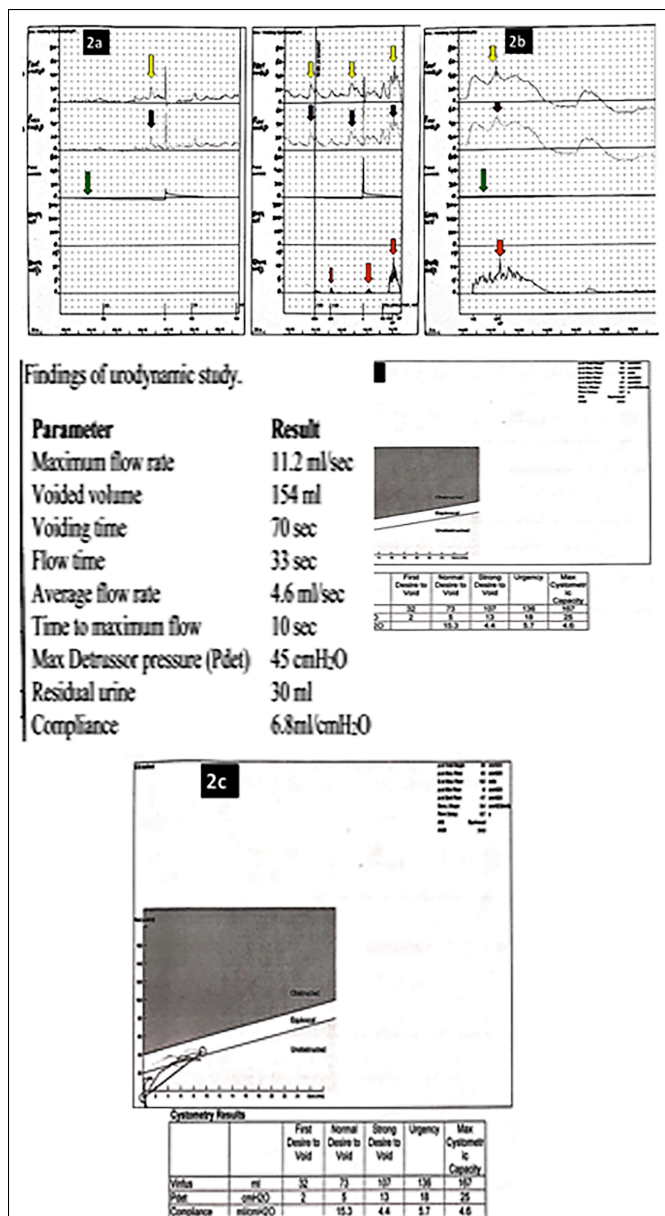
Second, the increased thirst sensation, and water intake, and hyperdynamic circulation leading to increased renal blood

flow and glomerular filtration rate are also contributing factors.<sup>6</sup> Moreover, the thyroid hormones-mediated increase in Na-KATPase and Ca-ATPase may increase perineal muscle activity.<sup>3</sup> These changes can explain the LUTs seen in hyperthyroidism.<sup>7,8</sup>

Voiding difficulties and abnormal findings on cystourethrograms, even with no LUTs were observed in a study conducted on Graves' disease patients.<sup>4</sup> Another study also reported that the risk of developing urinary incontinence in hyperthyroid patients increases significantly.<sup>9</sup> The present patient presented with urge incontinence, and this is the first-ever case being reported from Pakistan as per the literature.

Urinary incontinence refers to involuntary leakage of urine and can be classified into various types: stress, urgency, mixed or overflow incontinence. Stress incontinence involves leakage of urine with activities that increase the intraabdominal pressure. Urge incontinence is characterised by a sense of urinary urgency and increased frequency. Overflow incontinence occurs as a result of neurologic diseases or bladder outflow obstruction. Mixed incontinence exhibits features of both stress and urge incontinence.<sup>10</sup>

Urinary incontinence can be a major and bothersome concern for patients. However, because of social embarrassment, they may not seek medical attention or disclose it to the physician. It can be especially difficult to diagnose in middle-aged women due to other more common risk factors for incontinence, such as obesity, urinary tract infections, multiparity, menopause, and pelvic organ prolapse, etc. Therefore, we recommend a thorough and focused history, and a detailed clinical examination including gynaecologic assessment, and evaluation of thyroid function, especially in patients with no underlying risk factors for urinary incontinence. Hyperthyroidism-related urinary incontinence is reversible with ATDs, and complete recovery may occur in few weeks to months.



**Figure 2:** Urodynamic study: (a) and (b) showing phasic rise in detrusor pressure (Pdet, denoted by yellow arrows) and intravesical pressure (Pves, denoted by black arrows), stable abdominal pressure (Pabd, denoted by green arrows) and urinary leakage (Qura, denoted by red arrows); (c) demonstrates the relationship between Pdet (detrusor pressure) and urine flow (Qura).

In conclusion, urinary incontinence can be an early manifestation of hyperthyroidism and can be misdiagnosed, especially when more common signs and symptoms of hyperthyroidism are not pronounced. Given this possibility, physicians should be mindful while assessing such patients. In addition, patients with hyperthyroidism should be asked about urinary complaints, even if they are presenting with non-urinary symptoms, as patients rarely disclose such symptoms due to social embarrassment.

## PATIENT'S CONSENT:

A written, informed consent was obtained from the patient.

## COMPETING INTEREST:

The authors declared no competing interests.

## AUTHORS' CONTRIBUTION:

AAK, FUK, SMMK, MR: Participated in the conception and design of the study, data acquisition, draft writing, revision and final approval of the manuscript.

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