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HASHIMOTO THYROIDITIS PRESENTING WITH SHORT STATURE, PUBERTAL DISTURBANCE, AND TELOGEN EFFLUVIUM IN AN 11-YEAR-OLD GIRL": A CASE REPORT

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ABSTRACT

Background: Hashimoto thyroiditis is the most common cause of acquired hypothyroidism in children and adolescents. Delayed diagnosis may lead to growth retardation, pubertal abnormalities, and other systemic manifestations. Early identification and appropriate management are essential to prevent long-term complications**. Case Report:** An 11-year-old female with newly diagnosed hypothyroidism presented with significant hair loss following initiation of levothyroxine therapy. Clinical evaluation revealed pathological short stature, history of early menarche with subsequent menstrual irregularity, and absence of progressive secondary sexual characteristics. Laboratory investigations showed low FT3 levels with elevated anti-thyroid peroxidase (135 IU/mL) and thyroglobulin antibodies (16.6 IU/mL), confirming Hashimoto thyroiditis. Mild anemia and acanthosis nigricans were also noted. The patient was managed with levothyroxine dose optimization, nutritional supplementation, and endocrine follow-up. Clinical pharmacist interventions included identification of a potential levothyroxine–iron interaction, evaluation of medication-related adverse effects, and recommendations for growth and pubertal monitoring**. Conclusion:** This case highlights the atypical presentation of Hashimoto thyroiditis with short stature, pubertal disturbance, and telogen effluvium in a pediatric patient. Early diagnosis, individualized thyroid hormone therapy, and multidisciplinary care are crucial for improving growth, pubertal development, and overall clinical outcomes.

KEYWORDS: Hashimoto thyroiditis, Pediatric hypothyroidism, Short stature, Telogen effluvium, Autoimmune thyroiditis, Levothyroxine.

INTRODUCTION

Hashimoto thyroiditis (HT), also called chronic autoimmune thyroiditis, is the leading cause of acquired hypothyroidism in children and adolescents in iodine-sufficient areas. It is an autoimmune disorder that specifically targets the thyroid gland, leading to lymphocytic infiltration and the presence of anti-thyroid peroxidase (anti-TPO) and anti-thyroglobulin antibodies. This results in a gradual decline in thyroid function. The condition mainly affects females and is a significant cause of pediatric endocrine issues globally.

Thyroid hormones are vital for normal growth, bone development, metabolism, and puberty. A lack of these hormones during childhood can negatively impact physical growth, cognitive abilities, and reproductive development. The symptoms of hypothyroidism often appear gradually and include fatigue, weight gain, cold intolerance, constipation, dry skin, and slower growth. However, symptoms in children can vary widely, which may sometimes delay diagnosis and treatment.

Growth failure and puberty-related issues are important signs of prolonged hypothyroidism, but they are often ignored. Additionally, hair loss can result from a lack of thyroid hormones and can deeply impact the emotional health of affected children. Recognizing these unusual symptoms early is crucial. Quick diagnosis and proper levothyroxine replacement can support normal growth, enhance developmental outcomes, and avoid long-term problems.

The presence of autoimmune hypothyroidism with short stature, pubertal issues, and significant hair loss shows the varied clinical aspects of Hashimoto thyroiditis. This emphasizes the need for thorough endocrine assessment and collaborative management in pediatric patients.

CASE REPORT

An 11-year-old girl was admitted to the Department of Pediatrics for evaluation and management of newly diagnosed hypothyroidism. The patient weighed 26.9 kg and stood 121.5 cm tall, which was significantly below the expected height for her age. She had started levothyroxine therapy (100 µg once daily) two weeks before her admission.

The patient reported considerable hair loss after beginning thyroid hormone replacement therapy. Further evaluation indicated short stature and a history that suggested pubertal issues. She had previously started menstruating, with menstrual bleeding lasting for 3 to 4 days; however, she had not reported any menstrual cycles since. The patient also had not shown progressive development of secondary sexual characteristics. During her hospital stay, she experienced one episode of vomiting. She also reported a history of black stools before admission, with two more episodes during her stay.

The patient's past medical history included a hospital admission one month earlier for fever evaluation, from which she was discharged after a short time. She had no known drug allergies and followed a mixed diet. Her sleep, bowel, and bladder habits were reported as normal.

On physical examination, the patient was afebrile, with a pulse rate of 82 beats per minute and a respiratory rate of 20 breaths per minute. The general examination showed short stature and acanthosis nigricans. Cardiovascular examination revealed normal heart sounds (S1 and S2). The respiratory examination found no abnormalities, the abdominal examination showed a soft and non-tender abdomen, and the neurological examination was unremarkable.

Laboratory tests indicated mild anemia with a hemoglobin level of 10.0 g/dL and a red blood cell count of 3.44 million/mm^3. Thyroid function tests showed a low free triiodothyronine (FT3) level of 1.85 pg/mL. Autoimmune evaluation revealed elevated anti-thyroid peroxidase antibody levels (135 IU/mL) and thyroglobulin antibody levels (16.6 IU/mL), suggesting an autoimmune cause. Follicle-stimulating hormone (FSH) was elevated at 7.19 mIU/mL, while luteinizing hormone (LH) was 1.73 mIU/mL. Coagulation parameters, including prothrombin time, international normalized ratio, and activated partial thromboplastin time, were within normal limits.

Based on her clinical presentation, growth parameters, thyroid function profile, and positive thyroid autoantibodies, the diagnosis of Hashimoto thyroiditis with hypothyroidism was made.

During her hospital stay, the patient received levothyroxine sodium, vitamin B-complex, ferrous sulfate, multivitamins, lansoprazole, ondansetron as needed for vomiting, and topical liquid paraffin. Due to concerns about excessive levothyroxine dosing and ongoing hair loss,

her levothyroxine dose was reduced from 100 µg to 25 µg once daily at discharge. There were plans for further dose adjustment based on her clinical response and thyroid function monitoring. Ferrous sulfate was noted to potentially reduce levothyroxine absorption, and proper counselling on dose separation was provided. The patient was discharged on levothyroxine 25 µg once daily, vitamin B-complex, multivitamins, lansoprazole, and topical liquid paraffin, with recommendations for regular endocrinology follow-up, growth monitoring, and reassessment of pubertal development.

Table 1: Clinical Timeline.

Parameter	Case Content Reference
Initial Presentation	An 11-year-old female was admitted with complaints of significant hair loss following initiation of levothyroxine therapy for newly diagnosed hypothyroidism. Additional concerns included pathological short stature, history of early menarche with subsequent menstrual irregularity, and lack of progression of secondary sexual characteristics.
Diagnostic Phase	Physical examination revealed short stature and acanthosis nigricans. Laboratory investigations showed low FT3 (1.85 pg/mL), elevated anti-thyroid peroxidase antibodies (135 IU/mL), elevated thyroglobulin antibodies (16.6 IU/mL), elevated FSH (7.19 mIU/mL), and mild anemia (Hb: 10.0 g/dL). The diagnosis of Hashimoto thyroiditis was established based on clinical findings and positive thyroid autoantibodies.
Birth and Developmental History	Birth history was not available in the medical records. Developmental assessment revealed pathological short stature (height: 121.5 cm) and pubertal abnormalities characterized by a single episode of menarche without subsequent menstrual cycles or progression of secondary sexual characteristics.
Family History	No family history of thyroid disorders, autoimmune diseases, endocrine abnormalities, or other significant hereditary conditions was documented.
Environmental History	The patient consumed a mixed diet and had normal sleep, bowel, and bladder habits. No history of exposure to environmental toxins, radiation, or known thyroid-disrupting agents was reported.
Past Medical History	The patient had been hospitalized one month prior for fever evaluation and was discharged after a short duration. She had no known drug allergies.
Current Medication History	Levothyroxine 100 µg once daily had been initiated two weeks before admission for newly diagnosed hypothyroidism.
Working Diagnosis	Autoimmune hypothyroidism secondary to Hashimoto thyroiditis presenting with pathological short stature, pubertal disturbance, telogen effluvium (hair loss), and mild anemia.

Table 2: Diagnostic Assessment.

Investigation	Result	Interpretation
Hemoglobin (Hb)	10.0 g/dL	Reduced; indicates mild anemia, commonly associated with hypothyroidism and possible nutritional deficiency.
Red Blood Cell Count (RBC)	3.44 million/mm³	Reduced; suggestive of mild anemia.

Free Triiodothyronine (FT3)	1.85 pg/mL	Low; consistent with hypothyroid state and impaired thyroid hormone activity.
Anti-Thyroid Peroxidase Antibody (Anti-TPO)	135 IU/mL	Elevated; strongly suggestive of autoimmune thyroiditis (Hashimoto thyroiditis).
Thyroglobulin Antibody	16.6 IU/mL	Elevated; supports autoimmune etiology of thyroid dysfunction.
Follicle Stimulating Hormone (FSH)	7.19 mIU/mL	Elevated for age; may reflect altered pubertal hormonal regulation.
Luteinizing Hormone (LH)	1.73 mIU/mL	Within evaluable range; interpreted along with pubertal status and endocrine findings.
Prothrombin Time (PT)	Within normal limits	No evidence of coagulation abnormality.
International Normalized Ratio (INR)	Within normal limits	Normal coagulation profile.
Activated Partial Thromboplastin Time (aPTT)	Within normal limits	Normal intrinsic coagulation pathway function.
Anthropometric Assessment	Height: 121.5 cm; Weight: 26.9 kg	Height significantly below expected range for age, indicating pathological short stature.
Physical Examination	Acanthosis nigricans present	Suggestive of underlying metabolic/endocrine disturbance requiring follow-up.

FOLLOW- UP AND OUTCOMES:

The patient showed clinical stability during hospitalization and did not experience any acute complications. After a thorough clinical evaluation, doctors diagnosed Hashimoto thyroiditis-associated hypothyroidism and made necessary changes to the treatment plan. They reduced the levothyroxine dosage from 100 µg to 25 µg once daily because of concerns about excessive dosing and ongoing hair loss. The plan included gradually adjusting the dose based on future thyroid function tests.

At discharge, the patient was stable and was told to continue levothyroxine therapy along with other supportive medications. They received detailed advice about sticking to the medication schedule, taking levothyroxine on an empty stomach, and keeping it separate from iron supplements. Regular follow-ups with endocrinology were recommended to check thyroid function, growth speed, puberty progress, and response to treatment. Long-term follow-ups were planned to evaluate improvements in hair loss, optimize thyroid hormone levels, achieve normal growth parameters, and track the development of puberty.

DISCUSSION

Hashimoto thyroiditis is the most common autoimmune thyroid disorder in the pediatric population and represents the leading cause of acquired hypothyroidism in iodine-sufficient regions. The disease is characterized by progressive lymphocytic infiltration and destruction of thyroid tissue, resulting in impaired thyroid hormone synthesis. The presence of elevated

anti-thyroid peroxidase and thyroglobulin antibodies in the present case strongly supported the diagnosis of autoimmune thyroiditis. Early recognition is particularly important in children, as thyroid hormones play a critical role in growth, skeletal maturation, neurocognitive development, and pubertal progression.

One of the most notable findings in this patient was pathological short stature. Thyroid hormones are essential for normal growth hormone secretion, bone maturation, and longitudinal skeletal growth. Prolonged thyroid hormone deficiency may lead to reduced growth velocity and delayed skeletal development, resulting in significant height impairment. The patient's height of 121.5 cm was considerably below the expected range for her age, suggesting longstanding thyroid dysfunction prior to diagnosis. Delayed identification of hypothyroidism during childhood may compromise final adult height despite subsequent hormone replacement therapy, emphasizing the importance of early diagnosis and intervention.

The patient also exhibited pubertal abnormalities, including an isolated episode of menarche without progression of secondary sexual characteristics. Thyroid dysfunction has been associated with disturbances in the hypothalamic-pituitary-gonadal axis, leading to menstrual irregularities and altered pubertal development. In severe or longstanding hypothyroidism, hormonal imbalances may occasionally result in pseudoprecocious puberty, while normal pubertal progression remains impaired. Therefore, careful endocrine monitoring is essential to evaluate pubertal development and optimize long-term reproductive outcomes.

Significant hair loss was another prominent clinical feature. Hair follicles are highly sensitive to alterations in thyroid hormone levels, and both hypothyroidism and initiation of thyroid hormone replacement therapy may contribute to diffuse hair shedding or telogen effluvium. In the present case, the onset of hair loss shortly after initiation of levothyroxine therapy raised concerns regarding treatment-related exacerbation of hair shedding. Although transient hair loss has been reported during the initial phase of thyroid hormone replacement, restoration of euthyroidism generally results in gradual improvement in hair growth over time.

The patient was also found to have mild anemia, a commonly reported hematological abnormality in hypothyroidism. Reduced erythropoietin production, impaired iron utilization, and decreased bone marrow activity may contribute to anemia in affected individuals. The

concurrent administration of ferrous sulphate and levothyroxine warranted particular attention because iron supplements are known to reduce the gastrointestinal absorption of levothyroxine. Failure to recognize this interaction may result in inadequate therapeutic response and persistent hypothyroidism. Appropriate counselling regarding dose separation was therefore considered an important component of patient management.

Another clinically relevant finding was the occurrence of black-coloured stools. Although iron supplementation is a well-recognized cause of dark stools, the patient had reported a similar episode prior to initiation of ferrous sulphate therapy. Normal coagulation parameters reduced the likelihood of an underlying coagulation disorder; however, the precise etiology remained uncertain and warranted continued monitoring. This observation highlights the importance of comprehensive clinical assessment before attributing symptoms solely to medication use.

The management of pediatric Hashimoto thyroiditis requires individualized levothyroxine therapy with periodic monitoring of thyroid function, growth parameters, and pubertal status. In the present case, optimization of levothyroxine dosing, identification of potential drug-related problems, and patient counselling formed important aspects of care. The involvement of clinical pharmacists contributed to the recognition of medication-related concerns, promotion of medication adherence, and prevention of clinically significant drug interactions.

This case highlights the diverse clinical manifestations of pediatric Hashimoto thyroiditis and demonstrates how growth failure, pubertal disturbance, and hair loss may represent important indicators of underlying autoimmune hypothyroidism. Early diagnosis, appropriate thyroid hormone replacement, and multidisciplinary management are essential to improve growth outcomes, endocrine function, and overall quality of life in affected children.

CONCLUSION

In children with growth retardation, pubertal abnormalities and unexplained hair loss, even in the absence of classical symptoms of hypothyroidism. This case illustrates the diverse clinical presentation of pediatric autoimmune hypothyroidism and the potential consequences of delayed diagnosis on growth and development. Early recognition with thorough clinical evaluation and thyroid autoantibody testing allows for prompt institution of appropriate treatment and may prevent long-term sequelae. Moreover, proper optimization of levothyroxine therapy and awareness of possible drug interactions are important for achieving successful clinical outcomes.

This case highlights the need for a multidisciplinary approach among pediatricians, endocrinologists, and clinical pharmacists in the management of pediatric Hashimoto thyroiditis to ensure efficient treatment, better medication safety, and improved patient care.

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PATIENT'S PERSPECTIVE

The patient's parents reported concerns regarding their child's short stature, hair loss, and irregular pubertal development, which had affected her confidence and caused significant anxiety within the family. They were initially unaware that these symptoms could be related to an underlying thyroid disorder. Following diagnosis and counselling, they gained a better understanding of Hashimoto thyroiditis, the importance of long-term thyroid hormone replacement therapy, and the need for regular follow-up. The family expressed satisfaction with the multidisciplinary care provided and were reassured by the treatment plan, growth monitoring, and ongoing endocrine evaluation. They remained optimistic regarding improvement in their child's growth, hair loss, and overall health with continued treatment and follow-up.