

CHRONIC LYMPHOCYTIC THYROIDITIS IN ADOLESCENT FEMALE AND CHILDREN: AN INSTITUTIONAL STUDY

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Received : 18/11/2023
Received in revised form : 29/12/2023
Accepted : 14/01/2024

Keywords:

Thyroiditis, Juvenile, Cytology, Thyroid Function Tests, USG.

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DOI: 10.47009/jamp.2024.6.1.67

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2024; 6 (1); 343-347



Abstract

Background: Chronic lymphocytic thyroiditis predominantly affects individuals at the extremes of age, with a notable prevalence in postmenopausal women and adolescent females. The modern era has seen a rise in stress-related health issues, contributing to an increased incidence of juvenile lymphocytic thyroiditis, which often remains underrecognized. This study aims to evaluate the prevalence and characteristics of chronic lymphocytic thyroiditis in female children and adolescents, exploring the correlation between clinical presentations, ultrasonographic features, and thyroid function. **Material & Methods:** A hospital-based observational study was conducted over a two-year period. The study included female children aged 1-18 years who presented with clinical symptoms suggestive of thyroiditis. All participants underwent a comprehensive evaluation, including ultrasonographic examination, fine needle aspiration cytology, and thyroid hormone level assessment. The findings were then analyzed and compared. **Results:** The study found that chronic lymphocytic thyroiditis in adolescent females and children constituted 21.33% of thyroid cases. Among these, 60.93% were asymptomatic, 15.7% exhibited poor academic performance, and 23.43% presented with diffuse thyroid enlargement. Regarding thyroid function, 64.06% were hypothyroid, and 12.5% were subclinically hypothyroid. Ultrasonographic features, such as hypoechoic micronodules (28.12%) and diffuse hypoechogenicity (23.43%), were strongly associated with a hypothyroid state. **Conclusion:** The study revealed that a significant proportion of cases (60%) were asymptomatic, and 12.5% were subclinically hypothyroid. Diagnostic tools like fine needle aspiration cytology, ultrasonography, and thyroid function tests were crucial in diagnosis and guiding therapy. The findings underscore the need for routine screening of school children for chronic lymphocytic thyroiditis, emphasizing early detection and management.

INTRODUCTION

Hypothyroidism, marked by diminished serum thyroid hormone levels, plays a critical role in the altered physical and cognitive development in children and adolescents. In children, it can lead to delayed growth, reduced milestones, and impaired intelligence.^[1] Among adolescent females, it often results in menstrual irregularities and mood fluctuations, highlighting the significance of thyroid hormones in reproductive and psychological health. Typically, the early signs include altered growth patterns, not proportional to age, and may progress

to obesity. Despite these potential clinical manifestations, many children and teenagers with hypothyroidism remain clinically euthyroid and asymptomatic, necessitating a high index of clinical suspicion for early identification and treatment.

In adolescent females, the impact of hypothyroidism extends to menstrual and developmental irregularities, often presenting as pseudo precocious puberty. This includes premature vaginal bleeding and breast development without the corresponding accelerated bone maturation and linear growth typically associated with true precocious puberty.^[2] The etiology of pseudo precocious puberty in

hypothyroidism may involve the interaction between elevated Thyroid Stimulating Hormone (TSH) and Follicle Stimulating Hormone (FSH) receptors.^[3] Additionally, these adolescents might display features resembling polycystic ovary syndrome, including behavioral hyperactivity and ovarian cysts, but without the biochemical evidence of hyperthyroidism.^[4]

Aim and Objectives

The primary aim of this study is to comprehensively examine the prevalence, clinical features, and diagnostic challenges of hypothyroidism in children and adolescent females. This includes an in-depth analysis of the diverse manifestations of the condition, from physical growth patterns to reproductive health issues.

The specific objectives of the study are as follows:

To assess the prevalence of hypothyroidism in pediatric and adolescent populations, particularly focusing on its presentation in different age groups.

To investigate the clinical manifestations of hypothyroidism in children and adolescents, including the study of growth patterns, cognitive development, and reproductive health issues.

To evaluate the diagnostic challenges in identifying hypothyroidism in asymptomatic patients, especially in the context of pseudo precocious puberty and conditions mimicking polycystic ovary syndrome.

To explore the relationship between thyroid hormone levels and the severity of clinical manifestations, particularly in relation to menstrual irregularities and growth abnormalities.

To propose recommendations for the early detection and management of hypothyroidism in pediatric and adolescent populations, emphasizing the importance of regular screening and comprehensive care.

Through this study, we aim to bridge the knowledge gap in understanding pediatric and adolescent hypothyroidism, facilitating improved diagnosis, treatment, and overall management of this condition in younger populations.

MATERIALS AND METHODS

Study Design and Setting: This observational study was conducted in the Department of Pathology at a tertiary care center, Andhra Medical College, Visakhapatnam, over a two-year period from July 2021 to July 2023.

Participants: The study included female patients aged between 1 to 18 years, diagnosed clinically with thyroiditis. A total of 300 cases were initially identified, out of which 64 cases of chronic lymphocytic thyroiditis were recruited for the study. Exclusion criteria included patients undergoing thyroiditis treatment and male patients within the same age group.

Diagnostic Criteria: Chronic lymphocytic thyroiditis was diagnosed based on cytology. The criteria for diagnosis included the presence of sheets of thyroid cells interspersed with lymphocytes,

Hurthle cells, plasma cells, foreign body giant cells, epithelioid cells, and evidence of fibrosis.

Diagnostic Procedures

Thyroid Function Tests: All subjects underwent thyroid function tests to assess the levels of thyroid hormones and TSH.

Ultrasonography: Ultrasonographic evaluation was performed to identify characteristic features of thyroiditis. Parameters recorded included hypoechoic texture, micronodularity, echogenic septa, and hyperechoic nodules.

Fine Needle Aspiration (FNA): FNA of the thyroid gland was performed using the non-aspiration technique. The cytologist conducting the test was blinded to the radiological and biochemical findings of the patients.

Sample Processing: FNA samples were stained with Hematoxylin and Eosin and May Grunwald stains for detailed cytological evaluation.

Data Collection and Analysis: Data were collected regarding the clinical, radiological, and cytological features of each case. Statistical analysis was performed to assess the prevalence and characteristics of chronic lymphocytic thyroiditis in the study population. The association between sonographic features and cytological findings was also evaluated.

Ethical Considerations: The study was approved by the institutional ethics committee, Andhra Medical College, Visakhapatnam and informed consent was obtained from all participants or their legal guardians.

Quality Control: To ensure the accuracy of the diagnosis, all cytological slides were reviewed by two independent pathologists. Discrepancies were resolved through consensus.

RESULTS

Study Population: The study evaluated a total of 300 cases diagnosed with chronic lymphocytic thyroiditis. Among these, 64 cases (21.33%) were adolescent females and female children. The age distribution was skewed towards older children, with only 4.68% of cases presenting before 10 years of age and the majority, 95.31%, occurring between the ages of 11 and 18 years. [Table 1]

Clinical Presentation: The clinical presentation varied among the patients. A significant portion of the cases, 60.93%, were asymptomatic. About 15.7% of the patients exhibited poor academic performance, potentially linked to the thyroid condition. Menstrual irregularities were observed in 23.43% of the cases, highlighting the reproductive impact of the condition in adolescent females. [Table 2]

One notable case was a 10-year-old female who presented with congenital hypothyroidism, characterized by delayed milestones such as defective speech and learning abilities. This patient

had been on l-thyroxine therapy since the age of 4 years.

Thyroid Function Tests: The study revealed that 64.06% of the cases were clinically hypothyroid, while 23.43% maintained euthyroid status. Subclinical hypothyroidism was found in 12.5% of the cases. [Table 3]

Ultrasonographic Findings: Ultrasonography showed normal findings in 42.18% of the cases. However, specific ultrasonographic features were associated with hypothyroidism: hypoechoic micronodules were observed in 28.12% of the cases (Figure 1), and diffuse hypoechoic texture was noted in 23.43% of the cases (Figure 2), both correlating with a hypothyroid state. [Table 4]

Cytological Features: Cytological examination revealed a reactive population of lymphocytes, epithelioid cells, a few thyroid follicular epithelial cells, foreign body giant cells, plasma cells, and Hurthle cells (Figures 3 and 4). These findings were consistent with chronic lymphocytic thyroiditis.

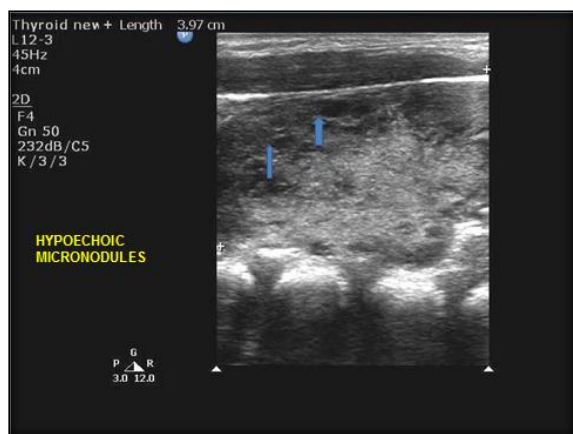


Figure 1: Hypoechoic micronodules in Chronic Lymphocytic Thyroiditis

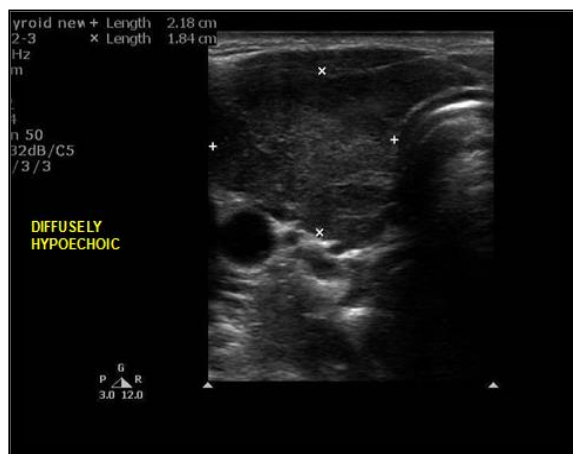


Figure 2: Diffuse Hypoechoic in Chronic Lymphocytic Thyroiditis

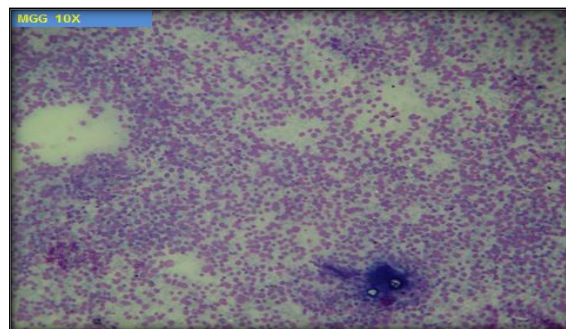


Figure 3: Diffuse sheets of Lymphocytes in Chronic Lymphocytic Thyroiditis (MGG,100X)

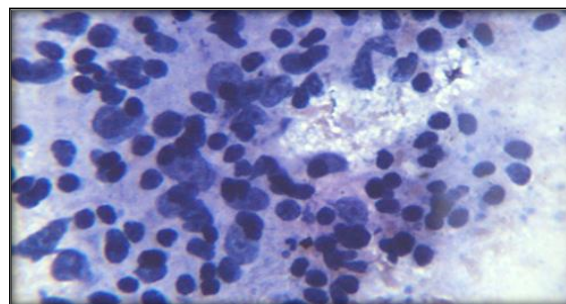


Figure 4: Follicular epithelial cells with Hurthle cell change in Chronic Lymphocytic Thyroiditis (H&E,400X)

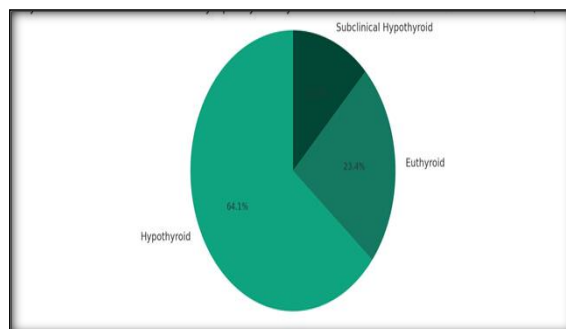


Figure 5: Thyroid function tests of Chronic Lymphocytic Thyroiditis in Adolescent Females and Children

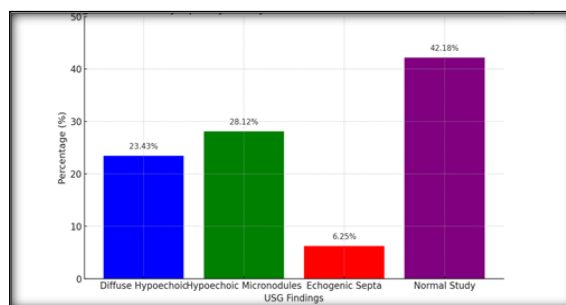


Figure 6: USG Findings of Chronic Lymphocytic Thyroiditis in Adolescent Females and Children(n=64)

Table 1: Age distribution of Chronic Lymphocytic Thyroiditis in Adolescent female and children-64

Age	Number of cases	Percentage
0-10 years	3	4.68
11-18 years	61	95.32

Table 2: Clinical presentation of cases with Chronic Lymphocytic Thyroiditis in Adolescent female and children-64

Clinical presentation	Number of cases	Percentage
Asymptomatic	39	60.93
Poor performance at school	10	15.7
Menstrual irregularities	15	23.43

Table 3: Thyroid function tests of Chronic Lymphocytic Thyroiditis in Adolescent female and children-64

Thyroid function tests	Number of cases	Percentage
Hypothyroid	41	64.06
Euthyroid	15	23.43
Subclinical hypothyroid	8	12.5

Table 4: USG findings of Chronic Lymphocytic Thyroiditis in Adolescent female and children-64

USG findings	Number of cases	Percentage
Diffuse hypoechoic	15	23.43
Hypoechoic micronodules	18	28.12
Echogenic septa	4	6.25
Normal study	27	42.18

DISCUSSION

Early diagnosis and treatment of hypothyroid state is essential to prevent short stature, developmental delay and acquired defects of defective learning and menstrual irregularities. In the era where there is no iodine deficiency, early detection of lymphocytic thyroiditis is very much essential. Asymptomatic diffuse enlargement of thyroid gland is a common presenting complaint. Thyroid function tests can be euthyroid, subclinical hypothyroid and sometimes hyperthyroid in the early stage.

In the study by Kaur J et al,^[5] chronic lymphocytic thyroiditis constituted 49.3% of cases in children. In the present study lymphocytic thyroiditis in adolescent females and children constituted 21.33% of cases.

In the study by Gopalakrishnan et al,^[6] analysed 98 subjects of autoimmune thyroiditis in the age range of 8 - 18 years. 24.55% were euthyroid, 32.6% had subclinical hypothyroidism and 42.9% hypothyroidism. In the study by Meena P. Desai et al,^[7] who analysed 96 children with diagnosis of juvenile autoimmune thyroiditis and his observations were 77% with hypothyroidism, 10% with hyperthyroidism and 13% with euthyroid. Family history of thyroid disease was seen in 33% of cases. In the present study, 64.06% were hypothyroid, 23.43% were euthyroid and 12.5% were with subclinical hypothyroidism. In two cases, both the siblings had lymphocytic thyroiditis with positive history in the mother.

In the study by Marwaha RK et al,^[8] ultrasonographic examination showed hypoechogenicity in 16% of cases, 15.2% were diagnosed on cytology and 25.2% had abnormal thyroid function tests. Cases with hypo echogenicity had higher percentage of thyroiditis on FNAC.

In the present study, 28.12% showed hypoechoic micronodules, diffuse hypo echogenicity in 23.43% of cases and 42.18 percent of cases with normal study. Cases with hypoechoic micronodules and diffuse hypo echogenicity on Ultrasound were associated with hypothyroid state.

Krishna M et al,^[9] observed that lymphocytic thyroiditis commonly presented with diffuse enlargement of thyroid and 20% were asymptomatic. In the present study, 60.93% were asymptomatic and 23.43% presented as goitre.

The findings of our study align with recent research, illustrating the complex nature and varied presentations of chronic lymphocytic thyroiditis in pediatric populations. Yeker et al,^[10] (2022) reported on the relationship between chronic lymphocytic thyroiditis and the aggressiveness of pediatric differentiated thyroid cancer, highlighting the potential for more severe disease presentations in young patients with underlying thyroiditis. This underscores the importance of vigilant screening and monitoring in pediatric patients diagnosed with thyroiditis, as early detection and management could potentially mitigate the progression to more severe thyroid-related conditions.

Additionally, the prevalence of chronic lymphocytic thyroiditis in our study resonates with the findings of Marwaha et al,^[11] 1998), who reported a significant prevalence of this condition among adolescent girls. This demographic trend was also observed in our study, emphasizing the need for heightened awareness and diagnostic consideration of thyroiditis in this specific age group. The hormonal and developmental changes occurring during adolescence could contribute to this increased prevalence and underline the importance of integrating thyroid health into routine adolescent healthcare.

Furthermore, the study by Tang et al,^[12] (2021) provides valuable insights into the clinical characteristics and follow-up of very young children with Hashimoto's thyroiditis. Their findings of varying presentations, even in children below three years, suggest that thyroiditis can manifest at any age and often requires individualized management strategies. This highlights the need for pediatricians and endocrinologists to maintain a high index of suspicion for thyroiditis in young children presenting with symptoms that could be attributed to thyroid dysfunction.

CONCLUSION

There is increased prevalence of chronic lymphocytic thyroiditis in children and adolescence especially in females. Clinically they are underdiagnosed. They can be in two forms goitrous form and atrophic form. In the present study, juvenile lymphocytic thyroiditis constituted 21.33% of cases being more common between 11 - 18 years of age with female predominance. Majority of cases, were asymptomatic. Subclinical hypothyroid cases were 12.5%, which can be easily diagnosed combining thyroid function tests, ultrasonography and fine needle aspiration cytology. Screening of school children for hypothyroid states due to thyroiditis is a must and should a part of school health programmes.

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