

Evaluation Of Clinical And Laboratory Findings Of Children And Adolescent Patients With Hashimoto Thyroiditis

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Abstract

Objective:

The purpose of this study was to evaluate the clinical and laboratory findings of 73 children and adolescents followed-up with a diagnosis of Hashimoto's thyroiditis.

Methods: Seventy-three patients aged between 4 and 18 years followed-up with a diagnosis of Hashimoto's thyroiditis at the pediatric endocrinology clinic between 2016 and 2019 were included in the study. All patients' thyroid function tests, thyroid antibodies, physical examination findings and thyroid ultrasonography results at diagnosis and follow-up were evaluated.

Results:

Fifty-seven (78.1%) patients were girls and 12 (21.9%) were boys, with a female/male ratio of 3.5/1. Goiter was detected at time of diagnosis in 25 cases (34.2%), but not in 48 (65/8%). At time of diagnosis, hyperthyroidism was present in 13 cases (17.8%), hypothyroidism in 16 (22%), subclinical hypothyroidism in 9 (12.3%), euthyroidism in 33 (45.2%), and subclinical hyperthyroidism in 2 (2.7%). The most common symptoms at time of presentation were swelling in the neck, sweating, fatigue, and lack of appetite. Heterogeneity and a hypoechoic appearance were observed in 77% of cases and nodules in 11% at thyroid ultrasonographic examination, while no pathology was determined in 12%.

Conclusions:

Children and adolescents with Hashimoto's thyroiditis may exhibit different and clinical findings. Thyroid ultrasonography occupies an important place in the diagnosis and follow-up of the disease.

Key words: Hashimoto's thyroiditis, child, adolescent

INTRODUCTION

Hashimoto's thyroiditis (HT) is an autoimmune disease which characterized by inflammation of the thyroid gland (1). HT is the most common cause of hypothyroidism in areas without iodine deficiency (2). Hashimoto's thyroiditis which accounts for 20% of patients with hypothyroidism, has been associated with autoimmune diseases such as systemic lupus erythematosus, rheumatoid arthritis, diabetes mellitus and Sjogren's syndrome (3). The diagnosis of HT is based on the detection of increased antithyroid antibodies in the serum and the presence of goiter (4). Patients may be present in the euthyroid, hypothyroid or hyperthyroid clinic at the time of admission (5). In this study, we aimed to evaluate epidemiological, clinical and laboratory findings of HT patients in our outpatient clinic.

MATERIALS AND METHODS

We were retrospectively evaluated files of 78 patients (67 female and 11 male) between 4 and 18 years of age who were diagnosed as HT in our Pediatric Endocrinology Clinic between 2016 and 2019. The diagnosis of HT was based on high levels of antithyroid antibodies levels and the findings on thyroid ultrasonography.

Thyroid function tests and antithyroid antibodies were evaluated. The patients were divided into groups as euthyroid (normal TSH and T4 levels), hypothyroid (high TSH and low T4), subclinical hypothyroid (high TSH and normal T4), hyperthyroid (suppressed TSH and high T4) and subclinical hyperthyroid (suppressed TSH and normal T4). Ultrasonographic examination of the thyroid was performed by expert radiologist radiologist using the device with the trademark Esaote Mylab Seven. In the calculation of thyroid volume, length \times depth \times width \times 0.523 of formula was used and the values above 97th percentile according to age were called as goiter. Thyroid function tests and antithyroid antibodies levels were studied with Beckman Coulter DxI800 device. Statistical analysis was performed using SPSS-24 package program. Abnormal variables were evaluated by Kruskal Wallis, Mann-Whitney U and Chi-square tests. Mean, standard deviation and percentages were calculated as descriptive statistics. In our study, $p < 0.05$ was considered significant. Ethics committee approval was received from Adiyaman University Ethics Committee in 2019. (Approval No: 2019 / 3-19).

RESULTS

In this study, 78.1% (57) of the patients were female and 21.9% (16) were male. The female / male ratio was 3.5/1. When diagnosed, euthyroidism in 45.2% (33) of the patients, hypothyroidism in 22% (16), hyperthyroidism in 17.8% (13), subclinical hypothyroidism in 12.3% (9) and 2.7% (2) had subclinical hyperthyroidism.

The number of patients, gender, age, presence of goiter, thyroid autoantibody levels and their distribution according to thyroid function tests were examined (Table 1). When patients were compared according to thyroid function tests; there was no significant difference in thyroid autoantibody levels, age, gender and presence of goiter ($p > 0.05$). There was no subclinical hypothyroidism and subclinical hyperthyroidism among the patients with goiter. The number of euthyroid patients was 20 (60.6%).

The autoantibody levels were examined according to the pubertal development stage (Table 2). Twenty-two (30%) of the cases were in the prepubertal period and 51 (70%) were in the pubertal period. Antibody titers of the patients at the first admission; anti-TPO in the prepubertal period: 487.36 ± 97 IU / mL, Anti TG: 30.3 ± 10 IU / mL, and in the pubertal period anti-TPO: 460 ± 61 IU / mL Anti TG: 30.3 ± 10 IU / mL. There was no significant difference between thyroid autoantibody levels according to pubertal development stage.

The complaints of the cases are shown together with their frequenc in the table 3. As shown in the table, 30 (41%) of the cases consisted of patients with impaired thyroid function tests during routine examinations at the pediatric outpatient clinic and diagnosed with Hashimoto's thyroiditis after further examination. According to thyroid USG results, while no pathology was detected in 9 patient (12%), heterogeneity and hypoechoic appearance in 56 (77%), and nodules in 8 (11%). Additional autoimmune disease was detected in seven patients (9.5%).

DISCUSSION

Hashimoto's thyroiditis (chronic lymphocytic thyroiditis) is the most common cause of thyroid dysfunction in children and adolescents and is responsible for most cases of acquired hypothyroidism with or without goiter (6). The prevalence of Hashimoto's thyroiditis (HT) ranges from 1.3% to 9.6% (7). Environmental factors such as bacterial or viral infections, increased iodine uptake and medications have been implicated in the etiology (5). Although there is evidence that HT is a familial inherited disease, specific genetic transmission could not

be established (8). There is correlation between the occurrence of the disease and some HLA (DR3, DR4 and DR5) tissue groups (9). Although the incidence of HT increases after the age of six years, it is most commonly seen in adolescence (9,10).

In domestic studies, Ozer et al. (11) reported the mean age at diagnosis as 14.35 ± 3.87 years, while Özsu et al. (12) reported as 11.5 ± 2.8 years. In our study, the mean age at diagnosis was 12.82 ± 3.16 years, which was compatible with the literature. Previous studies have reported that the incidence of HT in girls is 2-9 times higher than in boys (5,9,13). In our study, it was found to be 3.6 times higher in girls and compatible with the literature. Clinical picture of HT may vary from euthyroidism to subclinical hypothyroidism or hyperthyroidism (14). Dündar et al.(15) reported that 62,8% of the patients with HT were euthyroid at admission, while Özen et al.(16) reported this rate as 36.7%. In our study, euthyroidism was detected in 45.2%, hypothyroidism in 22%, hyperthyroidism in 17.8%, subclinical hypothyroidism in 12.3% and subclinical hyperthyroidism in 2.7% of the patients at the time of diagnosis. This finding was attributed to the early presentation of our patients. Patients with HT may present with complaints such as weakness, fatigue, forgetfulness, lack of concentration, dry skin, hair loss, chills, constipation and short stature (17). In our study, 30 (41%) of the cases consisted of patients with impaired thyroid function tests during routine examinations at the pediatric outpatient clinic and Hashimoto's thyroiditis was diagnosed after further examination. In addition, neck swelling, weakness, sweating, palpitation and irritability were the most common complaints. In the previous studies, antithyroid antibodies were found to be positive in 60% to 80% of patients with HT (18). However in our study, antithyroid antibodies were present in all cases at admission. Thyroid ultrasonography is used as a reliable diagnostic tool in HT cases. Typical USG findings of Hashimoto thyroiditis are defined as hypoechoic and heterogeneous thyroid tissue (19). Rarely, normal ultrasonographic findings may also be seen. In our country, Demirbilek et al. (5) reported as 92.9% of appearance rate compatible with thyroiditis on USG examination. In our study, heterogeneity and hypoechoic appearance in the parenchyma structure were observed in 77% of the cases. HT increases the risk of developing thyroid nodules rather than the risk of thyroid cancer in children and adolescents (20). Kaya et al. (21) reported the rate of thyroid nodule development in patients with HT as 34.4%, while Tuhan et al. (22) reported as 7.5%. Thyroid nodules were detected in 11% of our cases on USG examination and it was compatible with the study of Tuhan et al.

In conclusion, HT is a common autoimmune disease in children and adolescents and is the most important cause of goiter in areas without endemic iodine deficiency. Patients may present with euthyroidism, sometimes with hypothyroidism or hyperthyroidism. Thyroid USG has an important role in the diagnosis and follow-up of these patients.

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Tables.

Table 1. Distribution of some variables according to thyroid function status at the time of admission.

Table 2. Autoantibody levels according to pubertal development stage.

Table 3. Distribution of clinical complaints.

Table 1. Distribution of some variables according to thyroid function status at the time of admission.

	Euthyroid	Hypothyroid	Hyperthyroid	Subclinical hypothyroid	Subclinical hyperthyroid	p
Number of patients n (%)	33 (45,2)	16 (22)	13 (17,8)	9 (12,3)	2 (2,7)	
Average age (Years)	12,8±3	13,39±2,5	14,1±1,8	10,2±4,5	11,1±6,2	0,12*
The presence of goiter						
Yes	13(%39,4)	5 (%31,3)	7 (%100)	0	0	0,06**
No	20 (%60,6)	11 (%68,8)	6 (%46,2)	9 (%100)	2 (%100)	
Anti TG	81,4±38	63,6±25	282,3,9±164	61,7±29	20,8±14	0,19*
Anti TPO (IU/ml)	454±78	564±126	470±110	335±113	529±424	0,78*

Table 2. Autoantibody levels according to pubertal development stage.

	Prepubertal n:22	Pubertal (n:51)	p
Anti TG	30,3 ±10	143,2 ±49	0,08*
Anti TPO	487,36±97	460±61	0,49

Table 3. Distribution of clinical complaints.

Complaint	Number of patients (n)
No complaints	30 (%41)
Nervousness	1 (%1,36)
Sweating	6 (%8,2)
Weakness, loss of appetite	7 (%9,5)
Weight gain	5 (%6,8)
Hair loss	4 (%5,4)
Palpitation	6 (%8,2)
Constipation	4 (%5,4)
Swelling on the neck	10 (%13,6)