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* Badri Fadhil Alnidawi (CABM) [a]
Mohammed Abdul Jabar (CABM) [a]

Evaluation of Etiological Causes of Hypothyroidism among Patients Visiting Specialized Center for Diabetes and Endocrinology

ARTICLE INFORMATION

Authors addresses:
[a] Specialized Center for Diabetes and Endocrinology Baghdad, Iraq.
* Corresponding Author
E-mail address:
badrialnedawe@yahoo.com

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ABSTRACT

Background: Many structural or functional abnormalities can impair the production of thyroid hormones and cause hypothyroidism.
Objectives: to identify the main etiological causes of hypothyroidism among patients visiting Specialized Center for Diabetes and Endocrinology.
Methods: This study was conducted in the Specialized Center for Diabetes and Endocrinology on 217 patients with proved hypothyroidism, from 2006 to 2008. Every patient was tested with thyroid function tests, Ultrasound examination, thyroid autoantibodies, fine needle aspiration, radiology of skull, isotopes scan, also checking adrenal and gonadal function.
Results: Out of these 217 patients 120 patients have thyroiditis 33 patients had been undergone thyroidectomy. 39 patients had received radioactive iodine, 19 patients had congenital causes. One patient had Pituitary cause, 5 patients had graves diseases.
Conclusions: It was found that the common causes of hypothyroidism are either chronic autoimmune thyroiditis or destructive treatment for thyrotoxicosis. The results of this study suggest an increase in autoimmune thyroid disease similar to the rising prevalence of type1 DM possibly indicating a rising incidence of autoimmunity in young people.

Introduction:

Hypothyroidism is second only to diabetes mellitus (DM) as the most common endocrine disorders in the United States (US) and its prevalence may be as high as 18 case per 1000 person in the general population [1,2,8,11-13]. The disorder become increasingly common in women, its prevalence is higher in women and the elderly [2,11-13].

Estimates of the incidence of hypothyroidism vary depending on the population studied [3-5], in the US 0.3% have over hypothyroidism and 4.3% have subclinical or mild hypothyroidism [1,2,8,11-13].

The causes of hypothyroidism can be divided into six main categories [1,2,11-13], including;

1. Hypothyroidism with compensatory enlargement due to transient hypothyroidism.
2. Permanent loss or atrophy of thyroid tissue (atrophic hypothyroidism).
3. Transient Hypothyroidism.
4. Consumptive Hypothyroidism.
5. Central Hypothyroidism.
6. Resistance to thyroid hormone (RTH).

Primary Hypothyroidism accounts for approximately 99% of cases with less than 1% being due to thyrotropin (TSH) deficiencies [3-7]. Hashimoto's thyroiditis or chronic lymphocytic thyroiditis is the most common inflammatory thyroid disorder and the most frequent cause of goiter in the US [1,2,8,11-14]. For an unknown reason the prevalence of Hashimoto's thyroiditis has been increasing dramatically [1,2]. Other causes are irradiation of the gland subsequent to graves and surgical removal of the thyroid gland.

The earliest biochemical abnormality in hypothyroidism is a rising in serum TSH with normal thyroxine (T_4) and triiodothyronine (T_3) concentration (i.e., subclinical hypothyroidism) [8,10]. Followed by a fall in serum TSH at which stage most patients have symptom and benefit from treatment.

A significant proportion of subjects in the community have asymptomatic chronic autoimmune thyroiditis, characterized by both positive thyroid antibodies and normal thyroid function. Substantial proportion of those subjects have subclinical hypothyroidism [1,2,7,9,11-15,25]. However, a progressive increase in the prevalence of thyroid antibodies was revealed with age in women, as compared with a uniformly low prevalence with no age trend in men [10,15-18].

After destructive treatment for hypothyroidism the incidence of overt hypothyroidism is greatest in the first year after either radioactive iodine (RAI) or surgery. If serum TSH remains raised then the rate of progression towards overt hypothyroidism is between 2-6% per year after either treatment. After calculated dose of RAI 18% where hypothyroid at 5 years rising to 42% at 20 years (annual incidence 2%), while empirical doses of RAI produced a higher rate of hypothyroidism 40% after 5 years (annual incidence 8%) [11-13].

Subsequent to surgery only 2% were hypothyroid at 5 years but 28% were hypothyroid at 20 years (annual incidence 0.4% for the first decade and almost 3% per year for the second decade) [11-13].

The aim of this study is to evaluate and identify the main etiological causes of hypothyroidism among patients visiting the Specialized Center for Diabetes and Endocrinology.

Methods:

This study was conducted in the Specialized Center for Diabetes and Endocrinology (SCED), Baghdad, Iraq, for the period from December 2006 till April 2008.

Two hundred and seventeen patients, were enrolled (62 males and 155 females), their age range is between 1-70 years; most patients fall in the age range between 30 and 50 years.

Patients were meticulously investigated with full biochemical tests including thyroid function tests (TFT) and thyroid autoantibodies, sonographic examination and radiology of skull. Fine needle aspiration (FNA) and isotopes scan were performed for each patient. Thorough assessments of adrenal and gonadal functions were also carried out.

Results:

The analyses of our data (Table 1) revealed that 120 patients out of the 217 enrolled in the present study have thyroiditis (55.2%), including 20 males and 100 females with M/F 1:5. Thyroiditis was associated with goiter in 80 patients (10 males and 70 females), while the other 40 thyroiditis patients were presented with no goiter (16 males and 24 females).

Thirty nine patients (18.2%; 10 males and 29 females) have had received RAI. Thirty three patients (15.4%; 6 males and 27 females) had been undergone surgery (thyroidectomy). Nineteen patients (8.8%; 4 males and 15 females) have congenital causes. Five patients (2.3%; 2 males and 3 females) have graves cause in form of spontaneous late evolution. One patient (0.4%; a female) has pituitary cause (Sheehan's syndrome).

Table1: distribution of patients according to causes of Hypothyroidism.

Causes of Hypothyroidism		Cases	Gender		
		No. (%)	M	F	M/F
Thyroiditis	Goiter	80 (36.8)	10	70	1:7
	Non-goiter	40 (18.4)	10	30	1:3
	All	120 (55.2)	20	100	1:5
Post radiation (RAI)		39 (18)	10	29	1:3
Post surgery (Thyroidectomy)		33 (15.2)	6	27	1:4.5
Congenital		19 (8.8)	4	15	1:3.8
Graves		5 (2.3)	2	3	1:1.5
Pituitary		1 (0.5)	0	1	-
Total		217 (100)	42	175	1:2.5

Discussion:

The findings in this study indicate that the common causes of hypothyroidism are either autoimmune thyroiditis (goiterous autoimmune thyroiditis and atrophic autoimmune thyroiditis), or destructive treatment for thyrotoxicosis, both surgery and RAI.

Autoimmune thyroiditis (Hashimoto's thyroiditis) is the most common cause of hypothyroidism in US [1]. The majority of our cohort (120) who had thyroiditis had an autoimmune basis for their disease, so our findings may reflect an increase in the incidence of autoimmune thyroid disease.

Utah/Arizona study 1977 Whickham, UK survey showed that autoimmune thyroid disease is commonest cause of hypothyroidism. Similarly, the incidence of other diseases mediated through the immune system such as allergies and asthma is currently rising. It has been suggested that this may be caused by a decrease in exposure to infection in early life. This hypothesis is supported by the demonstration that children from small families had an increased prevalence of atopy if they started day nursery at an older age.

The anthroposophic lifestyle, including incomplete immunization and less use of antibiotics, has recently been claimed to lead to a lower prevalence of allergic disease and atopy. Thus lifestyle and secular changes over recent years may be responsible for an increase in disease mediated through the immune system.

Recently, Benhadi et.al showed that the risk of miscarriage, fetal loss and neonatal death is increased with higher TSH level and risk of poor obstetrical outcome is increased with relative thyroxine deficiency [15-18]. Moreover, the risk of fetal loss occurred even when maternal free thyroxine levels were normal [16].

Conclusions:

The results of this study suggest an increase in autoimmune thyroid disease similar to the rising prevalence of type1 DM possibly indicating a rising incidence of autoimmunity in young people.

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