Histopathological and Serological Study of Goitre

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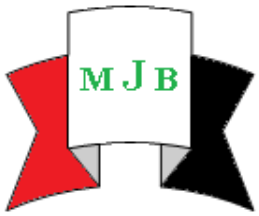

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Abstract

The correlation of histopathology and serology results in patient with goiter.

Accurate detection of thyroid autoantibodies by enzyme linked immunosorbant assay technique namely thyroglobulin antibody, thyroid peroxidase antibody is crucial in the differentiation of autoimmune thyroid disorders from other form of thyroid diseases.

Evaluation of the detection of thyroglobulin antibody and thyroid peroxidase antibody in different thyroid diseases using enzyme linked immunosorbant assay technique. Eighty patients admitted to Surgical Units of Al-Zahraa Teaching Hospital in Al-Kut from the period between august 2010 to August 2012 they were waiting to do thyroidectomy. They were chosen nonselective for serological evaluation of above autoantibodies, and correlation of the results with histopathological diagnosis. Colloid goiter is known cause of hyperthyroidism (5 were colloid goiter out of 10 total hyperthyroid patients) (50%), and still common thyroid surgery (60 were colloid goiterout of 80 thyroid surgery) (75%). 58 cases (72.5%) had colloid goiter, 11 patients had Graves' disease (13.75%), and 3 had lymphocytic thyroiditis (3.75%), 8 had thyroid neoplasia (both benign and malignant) (10%).

The serological results; Antibodies results were positive in 7 patients (11%) in colloid goiter (p-> 0.05), 6 patients (66.6%) and 1 patient (33.3%) for Grave's disease, and lymphocytic thyroiditis respectively (P-< 0.05)., while its all were negative in thyroid neoplasia. Serum thyroid autoantibodies determination is valuable test in clinical practice of autoimmune thyroid diseases.

دراسة مصلية ونسيجية لتضخم الغدة الدرقية

الخلاصة:

التحري الدقيق للأجسام المضاده للغده الدرقيه باستعمال طريقة التحري المناعي الخميري غير المباشر وهما الاجسام المضاده لكريين الدرقيه والاجسام المضاده لأنزيم فوق الاكسيد الدرقي تَعد طريقه حاسمه للتفريق بين أمراض المناعه الذاتيه للغده الدرقيه وأمراضها الاخرى.

تقييم الكشف عن الاجسام المضاده لكريين الدرقيه والاجسام المضاده لأنزيم فوق الاكسيد الدرقي في مختلف الامراض الغده الدرقيه بأستخدام تقنية التحري المناعي الخميري غير المباشر. ثمانون مريضا أدخلوا الى القسم الجراحي في مستشفى الزهراء التعليمي في الكوت للفتره من اب ٢٠١٠ الى اب ٢٠١٢, وكانوا بأنتظار إجراء عملية أستئصال الغده الدرقيه. تم أختيارهم بصوره غير أنتقائيه لقياس الاجسام المضاده المذكوره ودراسة توافقها مع التشخيص النسيجي المرضي لهم. الدراق الغرواني هو سبب شائع لفرط نشاط الغده الدرقيه (٥ حاله كانت دراق غرواني من أصل ١٠ كانوا يعانون من فرط نشاط الدرقيه) (٥٠%)وكذلك هو لايزال السبب الشائع لجراحة الغده الدرقيه (٦٠ حاله كانوا دراق غرواني من أصل ٨٠ أجروا جراحة الدرقيه) (٧٥%).

٥٨ حالة من حالات تضخم الغدة الدرقية الغروانية (دراق متعدد العقيدات) (٧٢.٥٪)، و ١١ حالات مرض جريفز (١٣.٧٥٪)، و ٣ مرضى التهاب الدرقية اللمفاوي (٣.٧٥٪)، و ٨ مرضى أورام الغدة الدرقية (كلا من الحميدة والخبيثة) (١٠٪).

نتائج وجود الأجسام المضادة موجبا في ٧ مرضى (١١٪) للدراق الغرواني (P>0.05) , ٦ مرضى (٦٦.٦%) ومريض واحد (٣٣٣.%) لمرضى كريفز ولألتهاب الغده الدرقيه اللمفاوي تسلسليا(P<0.05) و حالات الاورام جميعها سالبه. تحديد وجود الاجسام المضاده للغده الدرقيه هو فحص ذو قيمه سريريه في تشخيص حالات الامراض الذاتيه للغده الدرقية.

Introduction

Simple goiter may develop as a result of stimulation of the thyroid gland by TSH, either as a result of in appropriate secretion from microadenoma in the anterior pituitary or in response to chronically low level of circulating thyroid hormones. The most important factor in endemic goiter is dietary deficiency of iodine but defective hormone synthesis probably accounts for many sporadic goiters. TSH is not the only stimulus to thyroid follicular cell proliferation, other growth factors, including immunglobulins, exert an influence. The heterogenous structural and functional response in the thyroid resulting in characteristic nodularity may be due to the presence of clones of cells that are particularly sensitive to growth stimulation [1]. In spite of preventive measures of endemic goiter which has been introduced in Iraq, such as the use of iodized salt, thyroid specimens still constitute considerable number of biopsies received in histopathological laboratory [2]. Clinicians have been paid a little attention to the goiters induced by autoimmune mechanism in the management of thyroid diseases. Although in Iraq hyper-thyroidism arises from endemic goiter form 60% of total cases of thyrotoxicosis, the autoimmune mechanism still cause hyperthyroidism in considerable percentage [3]. Accurate detection of thyroid autoantibodies by enzyme linked immuno-sorbant assy (ELISA) is crucial in the differentiation of autoimmune thyroid disorders from other form of thyroiditis, in addition to that thyroid autoantibodies are useful immunological markers in the diagnosis, management and follow up of different types of autoimmune thyroid diseases.

Patients and Methods

A prospective study in which eighty patients admitted to the surgical unit of Al-Zahraa Teaching Hospital in Al-Kut for the period from August 2010 to August 2012 were chosen nonselective for evaluation. The patients were suffering from different thyroid diseases and they were waiting for doing thyroidectomy. They were submitted to following procedures:-

1- Serologically

2- Histopathogecally

1-Serological evaluation:-Five-ml venous blood samples were obtained preoperatively from all the above patients, the blood allowed to clot at room temperature, and then sera were separated by centrifugation at 1500 vpm for 5-10 minute. Heamolysis was avoided. The serum kept in plastic plain tubes, each sample was labeled by a serial number & patient's number. Then the sera were frozen at -20° c.

At proper time all stored serum samples are thawed then examined using enzyme linked immunosorbant assay (ELISA) for evaluation of:

- Serum thyroglobulin Ab (TgAb)
- Serum thyroid peroxidase Ab (TpoAb)

2- Histopathologiocal evaluation: - The thyroid specimens were examined grossly and carefully sectioned, few represented sections were done, these underwent the classical processing method to obtain finally the paraffin embedded tissue sections (blocks).

Methods: Two main techniques were used in the present work namely serological, and histopathological.

1. Serological tests by ELISA using Kallestad microplate Eia kit [5].

All stored serum of patients are thawed and subjected to the following serological tests: Determination of Tg Ab. and

Tpo Ab. All specimens are formaldehyde fixed, paraffin embedded, sectioned at 3-5 microns, mounting of the specimen on glass slides.

Results

This study includes the study of 80 patients suffering from different thyroid diseases. It includes 63 females and 17 males. F/M ratio is 3.7/1. Age range is 14-66 years, mean age (40 years + 12.1). There is predominance high female/male ratio in all thyroid diseases.

A total of 10 patients were hyperthyroid found, 5cases were colloid goiter (multinodular toxic goiter) 4patients with Grave's disease& 1with (LT). So multinodular toxic goiter constituted the most common cause of hyperthyroidism in Iraq, it represent 50% of hyperthyroidism. Regarding thyroid surgery in general colloid goiter represent 80% of all thyroid surgery.

Histopathological: - Table 1
Serological:-Thyroid autoantibodies namely TgAb and TpoAb are evaluated. Table 1 summarized the result.

Table 1: Clinical, histopathological, and serological findings

	Colloid Goiter	Graves' disease	Lymphocytic thyroiditis	papillary Carcinoma	Anaplastic Carcinoma	Follicular Adenoma	Total
Age range	20-66	14-43	20-30	35-60	56-64	25-35	
Female	44	10	3	3	2	1	63
Male	14	1	-	1	-	1	17
Toxicity	5	4	1	-	-	-	10
+veTgAb	5	4	1	-	-	-	10
+ve TPO Ab	4	5	-	-	-	-	9
+ ve both Abs	3	3	-	-	-	-	6
Total Abs	7	6	1	-	-	-	14
Number of patient	58	11	3	4	2	2	80

The percentages of antibodies in different groups of diseases are as follow:
Antibody results in Grave's disease are positive in 6 patients from total number of 11 patients (66.6%). LT 1 patient was positive out of 3 (33.3%), While 7 only are positive in colloid goiter from a total of 58 patients (12%).
The serological result is statistically significant in cases of Grave's disease and LT with P-value less than 0.05 & a statistically not significant in cases of Grave's disease (Table 2).

Table2: significance of positive thyroid autoantibodies findings

	Graves disease and lymphocytic thyroiditis N=14	Colloid Goiter N=58
No. of +veAb	7	7
P-value	< 0.05 (sig.)	> 0.05 (Not sig.)

Discussion

1- Clinical

• Multinodular toxic goiter represents 50% of toxic goiters, while Adel M.A & Aga Azaim K1993 who stated this figure as being 60% in Iraq [3]
• Thyroid surgery: In general colloid goiter represent 80% of all types of thyroid diseases undergo surgery, this finding is slightly lower than that found by Al-Hadithi W & Al-Hashimi AS 1985[19] who stated that colloid goiter represented 82% of total thyroid surgery, and this may be due to dropping in cases of colloid goiter as result of preventive measures of dietary iodine deficiency.

The predominant high F/M ratio in thyroid diseases could be due to pregnancy, lactation or sex hormones.

2. Serological

ELISA technique was applied in the present work for the determination of TgAb & TpoAb.

Regarding simple goiter; Roitt et al 1985 found 27% of simple goiter has Ab in their sera, Doniach et al 1960 found 33%, Anderson 1967 found 20%, Zweiman & Lisak 1979 found 20-30% , while Men & Kriss used sensitive Radioimmunoassy (RIA) found that 11% of patients with simple goiter have Abs [6]. Our results are slightly lower than that found by Yasso et al 1989 who found 16-17% of patients with simple goiter have Abs [6]. The higher results of other authors may be due to lack of sensitivity of the method used.

All our 10 patients of multinodular toxic goiter were negative for antibodies while it should follow simple goiter in the percentage of Abs, this can be explained by the role of antithyroid therapy prior to surgery in this group of patients.

Among patients with Graves' disease and lymphocytic thyroiditis, this work demonstrated TAbs range from 33-66% in Graves' disease which is in agreement with Caron P et al 1991, Foldes I & Levay A 1994 [7,8],and Dham, Anand et al 1995 in India [9]. But disagree with Nakamura H et al 1991 in Japan [10] and Tayyab M et al 1997 in Pakistan [11], and several recent studies [12-15] which found higher figures approaching 90%. The differences could be attributed to the use of antithyroid drugs prior to surgery; method applied for estimation of Abs, & could be due to geographical differences.

It should be mentioned here that viral infections can leads to increase level of Ab in blood [16]. So it should be considered in higher results.

The 8 cases of thyroid adenoma and carcinoma are negative for Abs. This small number of patients was insufficient to confirm the findings.

The relationship between malignant thyroid diseases and autoimmune thyroid disease had been confirmed by Spencer CA et al [17, 18], they showed that patients with differentiated thyroid carcinoma have 3 folds thyroid autoantibodies in their sera more than normal subjects.

Conclusion

Serum thyroid autoantibodies determination is valuable test in clinical practice of autoimmune thyroid disease, and it correlate with the activity of the disease and response to anti thyroid drugs.

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