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Original Article

Clinical Study on Role of Anti-thyroid Antibodies in Goiter Cases

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Abstract

Introduction: Autoimmune thyroid disease (AITD) is a common organ-specific autoimmune disorder affecting mostly the middle-aged women. About 2–4% of women and up to 1% of men are affected worldwide, and the prevalence rate increases with advancing age.

Materials and Methods: During the period between September 2009 and September 2011 50 cases of clinically suspected autoimmune diseases of thyroid were collected and pooled for investigation in the Government General Hospital, Kakinada. As the patient comes to the out-patient department, they were examined, and a battery of investigations was performed. Wherever necessary, the clinical diagnosis was changed as per biopsy proof and the patient grouped in the appropriate pool.

Results: Calculate the mean value from any duplicate reagents. Where appropriate, the mean values should be used for plotting. Plot the relative light unit (RLU) for each reference standard against the corresponding concentration of anti-thyroid peroxidase (TPO) in IU/ml on linear graph paper, with RLU values on the y-axis and anti-TPO concentrations on the x-axis. Connect the plotted points with straight lines. Read the concentration of each control and sample by interpolating on the calibration curve. Computer-assisted data reduction will simplify these calculations. If automatic result processing is used, a 4-parameter logistic function curve fitting is recommended.

Conclusion: It is concluded that anti-thyroid antibodies are present in 86.36% cases of Hashimoto's thyroiditis, 66.36% cases of Grave's disease, 25% cases of nodular goiter, and 20% cases of thyroid carcinoma, which is compared with standard studies. It is very small study to conclude in which type of carcinoma thyroid antibodies are more prevalent and impact of the presence of anti-thyroid antibodies in serum on prognosis of thyroid carcinoma.

Key words: Antibodies, Anti-thyroid, Autoimmune thyroid, Goiter

INTRODUCTION

Autoimmune thyroid disease (AITD) is a common organ-specific autoimmune disorder affecting mostly the middle-aged women. About 2–4% of women and up to 1% of men are affected worldwide, and the prevalence rate increases with advancing age.[1] AITD comprises a series of interrelated conditions including hyperthyroid Graves' disease (GD), Hashimoto's (goitrous) thyroiditis, atrophic autoimmune hypothyroidism (AH), postpartum thyroiditis, and thyroid-associated orbitopathy. Out of all these diseases, Hashimoto's thyroiditis (HT) and GD are the most common type AH affects about 5–10% of middle-aged and elderly women. GD is about one-tenth as common as hypothyroidism affecting mostly the younger individuals.[2] Many of these patients progress to hypothyroidism either spontaneously after treatment with anti-thyroid drugs or iatrogenically after radioiodine therapy or surgery. The development of antibodies to thyroid peroxidase (TPO), thyroglobulin (TG), and thyroid stimulating hormone receptor is the main hallmark of AITD.[3] Thyroiditis, and thyroid antibodies are found in a quarter to a third of patients with thyroid cancer, and such patients have an improved

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prognosis.[4] Pre-existing HT is the major risk factor for the development of non-Hodgkin's lymphoma of thyroid.[5] In 30% of nodular cases and 8% of normal individuals, anti-thyroid antibodies are present.[6] TPO antibodies present in breast cancer (33.2% Symth *et al.*).

MATERIALS AND METHODS

All these patient were submitted to the following procedures:

1. A thorough clinical examination.
2. Estimation of the thyroid functional status.
3. Fine needle aspiration cytology (FNAC) of the enlarged gland.
4. Autoantibody detection tests.

Clinical Examination

Patients were particularly looked for exophthalmos, excitability sweating, wasting, trembling, nervousness, etc., as he or she is entering the consultation room. General examination included careful palpation of the pulse to note the rate, rhythm and state of the vessel wall. The thyroid swelling is examined in a systematic manner, looking for the position, and extent size and shape of the gland. The gland is palpated to confirm the inspector finding, and then consistency, mobility, palpability of lymph nodes, carotid pulses are recorded. After percussing the sternum for the evidence of any retrosternal extension, the gland is auscultated for the presence or absence of bruit. General survey of the body ended the clinical examination, and any enlargement of the liver and spleen is noted.

IC index was quite useful in the clinical determination of the status

FNAC

FNAC is the investigation of choice for discrete thyroid swellings. FNAC has excellent patient compliance, simple, quick to perform, in outpatient department, repeatable. This technique, developed in Scandinavia some 35 years ago, has become routine throughout the world in past 25 years. FNAC reports should be reported on standard terminology. There is a trend to use ultrasound to guide the needle to achieve more accurate sampling and reduce the rate of unsatisfactory aspirates. 21–25 gauze needle is used.

Auto Antibody Tests for Thyroid

About 6 types of antibodies were described against thyroid (Blizzard *et al.*, 1959).

However, only two antibodies are studied in great detail.

1. Anti-thyroglobulin antibody.
2. Anti-microsomal antibody.

The anti-TPO and anti-TG chemiluminescence immunoassay (RELIGARE group of labs/RANBAXY LABS) information collected from these groups.

RESULTS

Calculate the mean value from any duplicate reagents. Where appropriate, the mean values should be used for plotting. Plot the RLU for each reference standard against the corresponding concentration of anti-TPO in IU/ml on linear graph paper, with RLU values on the y-axis and anti-TPO concentrations on the x-axis. Connect the plotted points with straight lines. Read the concentration of each control and sample by interpolating on the calibration curve. Computer-assisted data reduction will simplify these calculations. If automatic result processing is used, a 4-parameter logistic function curve fitting is recommended.

Case No 1

Name: K. Balaji Unit/ward: S_2/S_2
Age: 35 IP No: 24561
Sex: M DOA: 12-08-2010
Occupation: Agricultural DOS: 22-08-2010
Address: Jaggampeta DOD: 31-08-2010

Chief complaint

Neck swelling: Swelling in front and lower part of neck.
Duration: Since 1½ year.

Symptoms	Present	Absent
Dyspnea on effort	+1	
Palpitation	+2	
Tiredness	+2	
Preference to heat		−5
Preference to cold	+5	
Excessive sweating	+3	
Nervousness	+2	
Appetite increased	+3	
Weight decreased	+3	

Signs	Present	absent
Bruit over thyroid	+2	
Exophthalmos	+2	
Lid retraction	+2	
Lid lag	+1	
Hyperkinetic movements	+4	−2
Fine tremors	+1	
Moist,	+1	−1
Hot hands	+2	−2
Atrial fibrillation	+4	−3
PR 80/mt	0	
PR>80/mt	+3	
PR>90/mt	+3	
Palpable thyroid		

<11 points nontoxic goiter, 11–19 equivocal, >19 toxic

H/O present illness

Rate of growth: Slow H/O. Hypothyroid
Symptoms: Nil
H/O. Sudden change in size: No H/O. Hyperthyroid
Symptoms: Nil
H/O. Pain in the swelling: No H/O. Fever: No
H/O. Other swellings: No H/O. Loss of weight: No
H/O. Pressure symptoms: No H/O. Loss of appetite: No
Dyspnea: No H/O. Suggestive of
Metastases: No
Dysphagia: NO Cough and hemoptysis: No
Hoarseness of voice: No Jaundice: No
Bowel and micturition: Normal Bone pains: No

Past history

H/O. HTN, DM, TB: No
H/O. Similar complaint: No
H/O. Usage of anti-thyroid drugs: No
H/O. Previous surgeries: No
H/O. Irradiation to head and neck in childhood: No
H/O. Excessive usage of cough syrups: No

Family history

No relevant family history noted.

Personal history

Diet: Mixed Salt: Iodized salt
Since 6 years
Water source: Municipal
H/O. Excessive eating of Brassica vegetables: No

General examination

Built: Moderate Nourishment: Moderate
Anemia: No Cyanosis: No
Clubbing: No Jaundice: No
Pedal edema: NoGeneralized lymphadenopathy: No
Signs of thyrotoxicosis: No

Vital data

Temperature: Normal Respiratory rate: 14/mt
Pulse rate: 80.mt Blood pressure: 130/70 mm Hg

Local examination of the neck

Inspection

Shape: Oval
Site: In front and lower part of
Neck left side
Size: 2 cm × 2 cm
Surface: Smooth
Borders: Well defined
Moving up with deglutition: Present
Lower border: Visible
Skin over the swelling: Normal
Engorged veins: No
Visible pulsations: No
Any other swellings in the neck: No
Supraclavicular fossa: Normal
Position of trachea: Midline

Palpation

Local rise of temperature: No
Tenderness: Non tender
Site: In front and lower part of
Neck on left side
Size: 2 cm × 2 cm
Shape: Oval
Extent:
Above: 2 cm below thyroid notch
Below: 2 cm above suprasternal space
Right: 1 cm from midline
Left: 3 cm a from midline
Borders: Well defined
Plane of the swelling: Yes
Deep to deep fascia: Yes
Deep to sternocleidomastoid: Yes
Deep to strap muscles: Yes
Mobility: Yes
Moving up with deglutition: Yes
Getting below the swelling: Possible
Surface: Smooth
Consistency: Firm
Lahey's examination: Posterolateral surface normal
Surface: Normal
Kocher's test: Negative
Carotid pulsation: Palpable in normal position
Position of trachea: Midline
Lymph node examination: No lymphadenopathy
Number:
Site:
Level:
Size:
Shape:
Surface:
Consistency:
Mobility:
Tenderness:

Percussion (sternal, parasternal)

Resonant.

Auscultation over the superior poles

No bruit.

Systemic examination

CVS: S_{11}, S_2 heard
Lungs: Clear
Abdomen: No organomegaly
Musculoskeletal: No tenderness noted at

Ends of long bones
P/V: Normal
P/R: Normal

Provisional diagnosis
Solitary nodule thyroid left.

Management
Investigations
Hb%: 9.4 g% Random blood sugar: 92 mg%
Blood urea: 24 mg% Serum creatinine: 0.8 mg%
HIV status: Non-reactiveHBsAg status: Non-reactive
Blood group: A positive ECG: WNL

Specific investigations
Thyroid profile: Euthyroid status
Anti-thyroid antibodies:
Anti-TG: 300 U/ml
Anti-peroxisomal: 170 U/ml

FNAC
Thyroid swelling: Papillary carcinoma thyroid
Lymph nodes:
U/S neck: 2 cm × 3 cm hypoechoic lesion
Noted in left lobe.
X-ray chest: Normal
X-ray neck, AP, and lateral: No calcification
U/S abdomen: Normal
Indirect laryngoscopy: Both vocal cords normal

Clinicopathological diagnosis
Papillary carcinoma thyroid Stage I, T1n0m0.
Treatment: Total thyroidectomy
Post-operative biopsy: Papillary carcinoma thyroid
Post-operative period: Normal, voice pitch diminished
Radiotherapy/radio-iodine: No

Follow-up
The patient underwent regular follow-up for 6 months. No recurrence noted.

DISCUSSION

Autoimmunity is a condition in which structural or functional damage produced by the action of immunologically competent cells or antibodies against the normal components of the body. This is an exception to the theory of horror autotoxicus, (Ehrlich and morgenroth 1901) which postulates that one does not develop antibodies to one's own antigens. Struma lymphomatosa was first described by Hakaruhashimoto in 1912, in Kyushu, Japan. After the idea that it might be due to some autoimmune process, it is being called autoimmune thyroiditis. This disease is more common in women occurring in 95% of cases in females. The disease is showing increasing incidence. In present study out of 22 cases, 14 cases are in 40–50 years age group, 4 cases in 30–40 years, and 4 cases in 20–30 years. That the thyroiditis is due to an autoimmune process is widely accepted. Evidence to suggest that the other three disease, namely, GD, nodular goiter, and multinodular goiter also have an autoimmune basis is accumulating the world over. Ordinarily, the demonstration of anti-thyroid antibodies can be accepted as the evidence of the autoimmunity being the cause for the disease. However, the presence and incidence of the antibodies vary widely. Thus, the background of the seronegative patients is difficult to understand. It has been shown later that the seropositivity in the majority of the glands is determined by the histology of the gland. Thus, serology alone can neither prove nor rule out the role of autoimmunity. Previous publications have clearly drawn our attention to the variable incidence of the antibodies in these diseases.[5-18]

CONCLUSION

It is concluded that anti-thyroid antibodies are present in 86.36% cases of Hashimoto's thyroiditis, 66.36% cases of Grave's disease, 25% cases of nodular goiter, and 20% cases of thyroid carcinoma, which is compared with standard studies.

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