

Original article:

Study of incidence of auto-immune thyroiditis in western Maharashtra

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Abstract:

Autoimmune thyroiditis (AIT) is the most common thyroid disorder in current scenario. The disease results from an as yet poorly characterized defect or defects in immunoregulation and a cascade of events progressing from lymphocyte infiltration of the thyroid, to T-cell- and cytokine-mediated thyroid follicular cell injury, and apoptotic cell death. Approximately 70% of disease risk has been attributed to genetic background with environmental factors being important in triggering disease in susceptible individuals. The contribution of individual genes is small and probably polymorphisms in multiple genes play a role. Some immunosusceptibility genes affect immune recognition or response in general, while others are thyroid-specific. Environmental agents may act through an epigenetic mechanism.

In a tertiary care multispecialty hospital in Ahmednagar district a prospective study was undertaken in 264 patients with thyroid swelling and related complaints who attended medicine outpatient department after surgical opinion. It needs early diagnosis as well as early management , to prevent further complications and for decreasing morbidity and mortality in these patients. From this study, we can conclude that FNAC is a very reliable and cheap tool for the diagnosis of the thyroid nodule.

Introduction:

Autoimmune thyroiditis (AIT) is the most common thyroid disorder in current scenario . The disease results from an as yet poorly characterized defect or defects in immunoregulation and a cascade of events progressing from lymphocyte infiltration of the thyroid, to T-cell- and cytokine-mediated thyroid follicular cell injury, and apoptotic cell death. Approximately 70% of disease risk has been attributed to genetic background with environmental factors being important in triggering disease in susceptible individuals. The contribution of individual genes is small and probably polymorphisms in multiple genes play a role. Some immunosusceptibility genes affect immune recognition or response in general, while others are thyroid-specific. Environmental agents may act through an epigenetic mechanism. Antibodies (Abs) to a variety of thyroid-specific antigens are detectable in a majority of patients, but the role of Abs in mediating cell injury and death is unclear and only thyrotropin (TSH) receptor Abs significantly affect thyroid function by interfering with (or stimulating) the action of TSH. Nonetheless, thyroid peroxidase (TPO) Abs and thyroglobulin (Tg) Abs, present in a majority of patients, are valuable diagnostically as markers of underlying autoimmune thyroid destruction.(1)

Many of these patients progress to hypothyroidism either spontaneously after treatment with antithyroid drugs or iatrogenically after radioiodine therapy or surgery. The development of antibodies to thyroid peroxidase (TPO), thyroglobulin (TG) and thyroid stimulating hormone receptor (TSH-R) is the main hallmark of AITD (2). Thyroid disease is being increasingly diagnosed with greater awareness and is one of the chronic non-communicable disease

affecting women more though male population is not spared of the ailment.(3). As India is now predominantly Iodine sufficient we are nearing the peak prevalence of the autoimmune epidemic state.

Thyroid Iodine Deficiency disorders can affect almost every stage of human life as can be seen by following summary :

Fetus	Abortions, Still births, Congenital anomalies, Neurologic cretinism, Myxedematous cretinism Psychomotor defects
Neonate	Increased perinatal mortality, Neonatal hypothyroidism, Retarded mental and physical development
Child & Adolescence	Increased infant mortality, Retarded mental and physical development
Adult	Goitre and its complications, Iodine induced hyperthyroidism
All Ages	Goitre, Hypothyroidism, Impaired mental function, Increased susceptibility to nuclear radiation

MATERIALS AND METHODS:

This study was carried out in a tertiary care Multispeciality Sainath Hospital in Ahmednagar district from April 2012 to March 2013 in departments of Medicine, Biochemistry, Pathology, Surgery and ENT. This study included a total of 264 patients who attended the out patient department for thyroid swelling as a major complaint along with other illnesses. All patients were evaluated thoroughly by complete history taking and clinical examination. Haemogram ,Thyroid function tests ,ultrasonography of thyroid gland and anti-thyroid peroxidase (anti-TPO) were done routinely. Fine needle aspiration biopsy cytology (FNAC) was also performed to come to specific diagnosis.

OBSERVATIONS:

A total of 264 patients of different races and community ,different age groups and both sexes were present in the study

Out of 264 cases ,239 cases (90.53%) were females and 25 cases i.e. 9.47 % were males .(Table no.1) As expected there was a complete female predominance.

The commonest clinical presentation in this study was solitary thyroid nodule which comprised a total of 119 cases (45.07%), followed by multi-nodular goiter—53 cases (20.07%) ,diffuse thyroid swelling in 90 cases (34.09%) ,change of voice -- 45 cases (17.04 %) , pain in thyroid gland 24 cases i.e. 9.09 % , lymphadenopathy in six cases (2.27 %) ,dysphagia -4 cases (1.51 %) and fixing of the gland to the surrounding skin in 4 cases (1.51 %). (Table no.2)

In this study ,the maximum number of cases were within the age group between 21 and 50 years and in them the

most common age-group of presentation was 31-40 years i.e. 89 patients (33.71%) followed by the age-group between 21 and 30 years ie 58 patients (21.97%).

Auto-immune thyroiditis on the other hand was more common in age-group of 21-30 years i.e.22 cases (34.92%) followed by 31-40 and 41-50 years i.e.17 cases (26.98%) in each age-group.(Table no.) Among 63 cases of auto-immune thyroiditis 56 cases (88.88%) were females while only 7 cases (11.11%) were males .

Auto-immune thyroiditis was histopathologically diagnosed in 63 cases .Anti-thyroid Peroxidase (Anti-TPO) was done in 60 cases as 3 cases lost during follow up. Out of 60 cases ,53 cases (88.33%) showed high antibody titre (anti-TPO) and 7 cases (11.66%) showed low titre of anti-TPO.(Table no.4)

DISCUSSION:

Iodine deficiency disorders (IDD) encompass a broad spectrum including goiter, reduced cognitive function and work efficiency, delay in physical and mental milestones in childhood, and in the extreme cases, cretinism.(4). Evidence from literature indicates that iodine intake up to 1 mg/day is tolerated by normal adults.(5).However, reports suggest that continued exposure to iodine may result in clinical conditions like goiter, thyroid dysfunction (both hyp and hyper-thyroidism), and thyroid autoimmunity.(5) .

In India, Universal Salt Iodization (USI) has been in force since 1984.

The impact of this programme on thyroid status has been reported by Gopalkrishnan, Kabaz and other Indian workers in school age children

To differentiate the various types of thyroid lesions is very important in the management of these patients .Newer sophisticated investigations require costly instruments and special technically skilled personnel dealing with them .Moreover , these amenities are available in limited areas and are beyond the reach of poor common people of our country.

This method is suitable for very little risk during the procedure .The procedure is helpful in debilitated patients ,readily repeatable and useful for multiple lesions. FNAC has been used rampantly for the last four decades in various parts of the whole world as the first line diagnostic tool .Since early 1950s , FNAC is being used routinely in all forms of thyroid lesions .

In the present study, a total of 264 patients diagnosed clinically as thyroid enlargement were subjected to FNAC during a period of twelve months . FNAC was done in all 264 patients with thyroid swellings .Out of these, in 13 cases adequate HPE material could not be obtained as aspirates in these cases contained only TPO is the key thyroid enzyme catalyzing both the iodination and coupling reaction for the synthesis of thyroid hormone. It is of mol wt between 100 to 105-kDa and previously was known as thyroid microsomal antigen (6). Anti-TPO autoantibodies are found in over 90% of patients with autoimmune hypothyroidism and Graves' disease.

Baloch et al (9). featured that TPO-Ab is detectable more often than TG-Ab .When both are present ,the titre of TPO-Ab tends to be higher because of the blocking nature of circulating TG itself .Thus , in practical and cost-effective terms , measurement of TPO-Ab alone is sufficient to confirm the diagnosis of auto-immune thyroid disease . Importantly ,in addition , only a small proportion of patients with auto-immune thyroiditis have positive TG-Ab without TPO-Ab .(9). Studies from iodine deficient areas of Brazil and Denmark report high TPO Ab positivity prevalence (13-16.9%).(9,10). The prevalence of TPO Ab positivity in the present study, correlates well

with these studies .

From this study , we can conclude that FNAC is a very reliable and cheap tool for the diagnosis of the thyroid nodule.

Conclusion:

From this study, we can conclude that FNAC is a very reliable and cheap tool for the diagnosis of the thyroid nodule.

Table no.1: clinical presentation of thyroid disorders

Sr.no.	Presentation	No. of cases	Percentage
1	Thyroid nodule	119	45.075
2	Multinodular thyroid goitre	53	20.075
3	Diffuse thyroid goiter	90	34.09
4	Change in voice	45	17.045
5	Pain in neck	24	9.09
6	Dysphagia	4	1.51
7	Fixity to surrounding skin	4	1.51

Table no.2 : sex-wise distribution of thyroid disorders

Sex	No. of cases	Percentage
Male	24	9.47
Female	227	90.53

Table no .3.Distribution of TPO-Ab among Auto-immune Thyroiditis.

Ab-titre	No.of cases	Percentage
Low	7	11.66
High	53	88.33

Table no. 4 :Age-wise distribution of Auto-immune thyroiditis cases

Age –group in years	No. of cases	Percentage
0-10	0	0
11-20	8	13.33
21-30	19	31.66
31-40	16	26.66
41-50	16	26.66
51-60	1	1.66
Total	60	100

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