

Usefulness of Ultrasonography in the Treatment of Thyroid Disorders

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Abstract

Original Research Article

Introduction: Thyroid gland plays a fundamental role in the development of tissue metabolism and it affects various organs systems. An assessable amount of non TSH reliant on T4 secretion also happens typically. Mostly, two major group of thyroid disorders are familiar: a) hyperthyroidism b) hypothyroidism. **Material & Methods:** This was a comparative cross-sectional study and was conducted in the Department of Obstetrics and Gynaecology at 250 Bed Jamalpur General Hospital, Jamalpur, Bangladesh during the period from 1st June 2019 to 31st December 2019. A total number of 50 patients had been selected for this study and they were divided equally in two major groups: subclinical hypothyroidism group and subclinical hyperthyroidism group. Complete physical examination routine lab test, liver function test, renal function test, ECG, fasting blood glucose, thyroid profile, ultrasonography of thyroid gland and thyroid function test was done to all these patients. TSH was done in a fasting state by Enzyme Immunoassay. **Results:** A total of 100 patients were divided equally into two major groups. Age Distribution in Subclinical Thyroid Disorders shown in Table I describes that majority in the both groups were aged between 41-50 years. Assessment of thyroid size in sub clinical thyroid gland disorders shows that 84% had normal Thyroid size and the rest 16% had increased Thyroid size in subclinical hypothyroidism group, while in subclinical hyperthyroidism group 80% had normal Thyroid size and 20% had increased Thyroid size. An assessment of echotexture was shown where in subclinical hypothyroidism group 9(36%) had decreased echogenicity, 16(64%) had homogenous echogenicity; while in subclinical hyperthyroidism group 18(72%) had homogenous echogenicity, 7(28%) had increased echogenicity. **Conclusion:** Thyroid nodules are mutual in cases of sub clinical hyperthyroidism and in subclinical hypothyroidism cases nodules were very rare.

Keywords: Thyroid Disorders, Subclinical Thyroid Disorders, Hyperthyroidism, Hypothyroidism, Echogenicity.

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INTRODUCTION

Thyroid gland plays a fundamental role in the development of tissue metabolism and it affects various organs systems. An assessable amount of non TSH reliant on T4 secretion also happens typically. Mostly, two major group of thyroid disorders are familiar: a) hyperthyroidism b) hypothyroidism. Subclinical thyroid disorders can be diagnosed by thyroid tests before indicators and complications occur, are regarded as risk issues for emerging hyperthyroidism and hypothyroidism complication. The goal line of screening is to classify and give treatments to patients with subclinical thyroid dysfunction before they advance complication. Subclinical hypothyroidism [SCH] is well-defined as a state of improved serum TSH, with circulating T4 and T3 absorption within the population reference series. The occurrence of SCH

differs from 4 and 10% depending upon the gender, age and population studied [1]. SCH is communal specifically in older women [up to 20%] in above the age of 60 years [2]. The thyroid gland is to some extent more echo -dense rather than the in-line structures since its high iodine content. Subclinical hyperthyroidism is categorized by a small amount TSH and standard level of circulating thyroid hormones. The incidence of subclinical hyperthyroidism is about 1% in above 60 years old men and 1.5% in above 60 years old women. Global prevalence of it in numerous huge community and medical surveys has been reported to range from 2-16% [3]. Existing endorsements for the treatment of subclinical hyperthyroidism witnessing and monitoring the pts with limited TSH destruction [0.1-0.4] but to treat the pts with complete TSH suppression [$<0.1\text{mIU/L}$] [4, 5]. Ultrasonography possibly will spot

nonpalpable nodules cysts, will estimate nodule and goiter size, will screen the deviations following treatment and will guide the fine needle objective biopsy. Subsequently, the orientation of ultrasonography, it has become clear that nodules in thyroid gland are very dominant ranging from 17% to 60% if older people are involved in the study [6]. Also, hypo-echogenicity, micro- calcification, indistinct borders, increased nodular flow may have prognostic value in characteristic malignant from benign nodules. The ordinary echogenicity signified norm follicular or macrofollicular tissue structure, despite the fact that a hypo-echogenicity outline characterized a microfollicular or solid structure in pts with chronic autoimmune thyroiditis [7].

OBJECTIVES

a. General objective:

- Usefulness of ultrasonography in the treatment of Thyroid Disorders

b. Specific Objectives:

- To compare between subclinical hypothyroidism disorders and subclinical hyperthyroidism disorders
- To assess the utility of ultrasonography in the treatment of Thyroid Disorders

METHODOLOGY & MATERIALS

This was a comparative cross-sectional study and was conducted in the Department of Obstetrics and Gynaecology at 250 Bed Jamalpur General Hospital, Jamalpur, Bangladesh during the period from 1st June 2019 to 31st December 2019. A total number of 50 patients had been selected for this study and they were divided equally in two major groups: subclinical hypothyroidism group and subclinical hyperthyroidism group. Complete physical examination routine lab test, liver function test, renal function test, ECG, fasting blood glucose, thyroid profile, ultrasonography of thyroid gland and thyroid function test was done to all

these patients. TSH was done in a fasting state by Enzyme Immunoassay.

Inclusion Criteria

- Patients of Sub Clinical Hyperthyroidism

Exclusion Criteria

- Patients of Overt Hyperthyroidism
- Age <20 Years and >60 Years
- Patients on Thyrotoxic Drugs
- Pregnancy

RESULT

A total of 100 patients were divided equally into two major groups. Age Distribution in Subclinical Thyroid Disorders shown in Table-1 describes that majority (40%) in subclinical hypothyroidism group were aged between 41-50 years followed by 2 (8%) were aged between 21-30 years, 6 (24%) were aged between 31-40 years and 7 (28%) were aged between 51-60 years; and that majority (56%) in subclinical hypothyroidism group were aged between 41-50 years followed by 1 (4%) were aged between 21-30 years, 4 (16%) were aged between 31-40 years and 6 (24%) were aged between 51-60 years. Assessment of thyroid size in sub clinical thyroid gland disorders (Table-2) shows that 84% had normal Thyroid size and the rest 16% had increased Thyroid size in subclinical hypothyroidism group, while in subclinical hyperthyroidism group 80% had normal Thyroid size and 20% had increased Thyroid size. In Table-3 an assessment of echotexture was shown where in subclinical hypothyroidism group 9(36%) had decreased echogenicity, 16(64%) had homogenous echogenicity; while in subclinical hyperthyroidism group 18(72%) had homogenous echogenicity, 7(28%) had increased echogenicity. Figure-1 showing BMI in subclinical thyroid disorders where 48% had normal BMI, 32% had increased BMI and the rest 20% had decreased BMI.

Table-1: Age Distribution in Subclinical Thyroid Disorders (n=50)

Age	Subclinical hypothyroidism	Subclinical hyperthyroidism
21-30	02 (8%)	01 (4%)
31-40	06 (24%)	04 (16%)
41-50	10 (40%)	14 (56%)
51-60	07 (28%)	06 (24%)
Total	25	25

Table-2: Assessment of thyroid size in sub clinical thyroid gland disorders. (n=50)

Thyroid size	Subclinical hypothyroidism	Subclinical hyperthyroidism
Normal	21 (84%)	20 (80%)
Increased	04 (16%)	05 (20%)
Total	25	25

Table-3: Assessment of Echotexture (n=50)

Echogenicity	Subclinical hypothyroidism	Subclinical hyperthyroidism
Decreased	09 (36%)	-
Homogenous	16 (64%)	18 (72%)
Increased	-	07 (28%)
Total	25	25

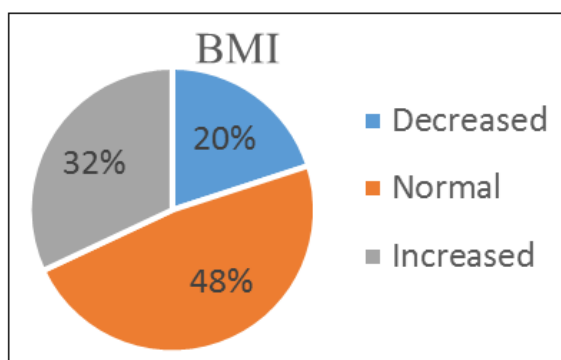


Fig-1: BMI in Subclinical Thyroid Disorders (n=50)

DISCUSSION

Thyroid abnormalities are usually under diagnosed because patients are typically asymptomatic and have very delicate symptoms. Ultrasonography could be of much worth in such cases. The results of ultrasonography can help in subclinical disorder, and also in treating such cases and stopping development to evident thyroid disorders. In our study ultrasonography of thyroid in subclinical thyroid disorders were associated with symptoms and other tests. Very few studies have been conducted to assess the connection of ultrasonography of subclinical thyroid disorders and thyroid enzyme and various clinical features of these disorders. In our study 25 subclinical hypothyroidism and 25 Subclinical hyperthyroid disorders were selected as group 1 and group 2 respectively. In our study we found majority of subclinical thyroid disorders were seen between age group 31-60 years, out of this 40% of subclinical hypothyroidism and 56% of subclinical hyperthyroidism were seen in this age group 41-50 years. According to Baloch, Z, Fatourehchi, V, the incidence of SCH varies between 4-10%, depending upon the age, gender and population study [1] Up to 20% in women above of 60 years suffers from SCH [2]. In our study an assessment of echotexture was done where in subclinical hypothyroidism group 9(36%) had decreased echogenicity, 16(64%) had homogenous echogenicity; while in subclinical hyperthyroidism group 18(72%) had homogenous echogenicity, 7(28%) had increased echogenicity. Irregular echo pattern whether accompanied by hypo echogenicity or not, was another possible marker of thyroid failure, indicating use of US thyroid in detecting early and sub clinical thyroid disorders [8]. A greater proportion of patients with subclinical hypothyroidism and patients with subclinical hyperthyroidism had marked color flow Doppler sonography pattern [78% vs 15% [P<0.001] and 53% vs 15% [p<0.001] respectively [9, 10].

Limitations of the Study

This study was conducted in one district with small sample size, which may not reflect the scenarios of the whole country.

CONCLUSION AND RECOMMENDATIONS

In our study 25 subclinical hypothyroidism and 25 subclinical hyperthyroidisms were taken between ages 21-60 years of age. Thyroid ultrasonic findings were associated with subclinical thyroid disorders. Thyroid nodules are mutual in cases of sub clinical hyperthyroidism and in subclinical hypothyroidism cases nodules were very rare. BMI was found to be increased with increase of TSH and decreases with decrease of TSH.

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