Journal of Advanced Zoology

ISSN: 0253-7214

*Volume **44 Special Issue-2 Year 2023** Page **2110:2115***

Role of USG in thyroid diseases

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Article History
Received: 08July2023
Revised: 29 Aug 2023
Accepted: 02 Oct 2023

Abstract:
One of the most distinctive glands in the body is the thyroid gland. It is the only gland in the body that gets its iodine directly from outside sources, making it unique among glands. It is the only gland in the body that is able to make, store, and expel its own products when the body has a need for those goods. It has a very abundant blood supply that can be compared to that of the kidneys. Additionally, it is the only gland that can be compared to that of the kidneys. Therefore, the regulation that it has is extraordinary. It is quite superficially situated, and as a result, high frequency probes may be utilised to study it with relative ease. There have been investigations in which a straightforward transvaginal probe served as an effective research tool for examining the gland. The primary reason for this is that it is extremely superficially situated, and as a result, high frequency probes may be utilised effectively to analyse such structures in great detail. In this work, an effort was made to investigate the function that USG plays in thyroid illnesses.

Keywords: USG, Thyroid Gland, Benign, Malignant, Atypical.

Introduction:

In our nation, people frequently suffer from illnesses of the thyroid gland. Because it controls a variety of metabolic processes, the thyroid gland is one of the endocrine glands in the human body that is considered to be among the most significant. One of the most distinctive glands in the body is the thyroid gland. It is the only gland in the body that gets its iodine directly from outside sources, making it unique among glands. It is the only gland in the body that is able to make, store, and expel its own products when the body has a need for those goods. It has a very abundant blood supply that can be compared to that of the kidneys. Additionally, it is the only gland that can be compared to that of the kidneys. Therefore, the

regulation that it has is extraordinary. It is quite superficially situated, and as a result, high frequency probes may be utilised to study it with relative ease. There have been investigations in which a straightforward trans vaginal probe served as an effective research tool for examining the gland. The primary reason for this is that it is extremely superficially situated, and as a result, high frequency probes may be utilised effectively to analyse such structures in great detail.

Thyroiditis is a condition that affects a significant number of people in this country.1-3. Even though our nation has a high prevalence rate for the sickness, the condition is frequently misunderstood or ignored, which can lead to disastrous outcomes for the patient. According to the findings of research, one out of every 10 persons in India has the thyroid problem.4,5 The condition of hypothyroidism is much more frequent than its counterpart, hyperthyroidism. If it goes undiagnosed and untreated for a significant amount of time, it can lead to a wide variety of other metabolic problems. Women are more likely to be impacted than males, and this may be because the thyroid is the only endocrine organ that directly requires on iodine from an external source in order to produce hormones. This means that women are more likely to be affected. 6,7 Because early diagnosis and timely treatment are essential, USG is one screening method that is available. In the past, radioactive materials were utilised for diagnosis and subsequently administered into the body. However, USG has steadily taken over and is now commonly employed in the screening processes for thyroid illnesses. In this work, an effort was made to investigate the function that USG plays in thyroid illnesses.

Aims and Objectives:

To study the role of USG in screening the Thyroid Gland.

Materials and Methods:

From September 2021 through October 2022, the study was carried out.

The Department of Radiodiagnosis was responsible for conducting the research, and a total of thirty patients were chosen for the study.

Inclusion Criteria:

Age of the patient in between 30 to 60 years. This was done to eliminate the age-related bias.

Exclusion Criteria:

Patients who were on medication for thyroid disease

Results:

Table 1: Mean age

Mean Age	Range	Standard Deviation
35.38 years	21-60 years	02.28 years

Table 2: Age Distribution:

Age	Thyroid Disease
20-30 years	08
30-40 years	10
40-50 years	08
50-60 years	04

Graph 1: Age Distribution

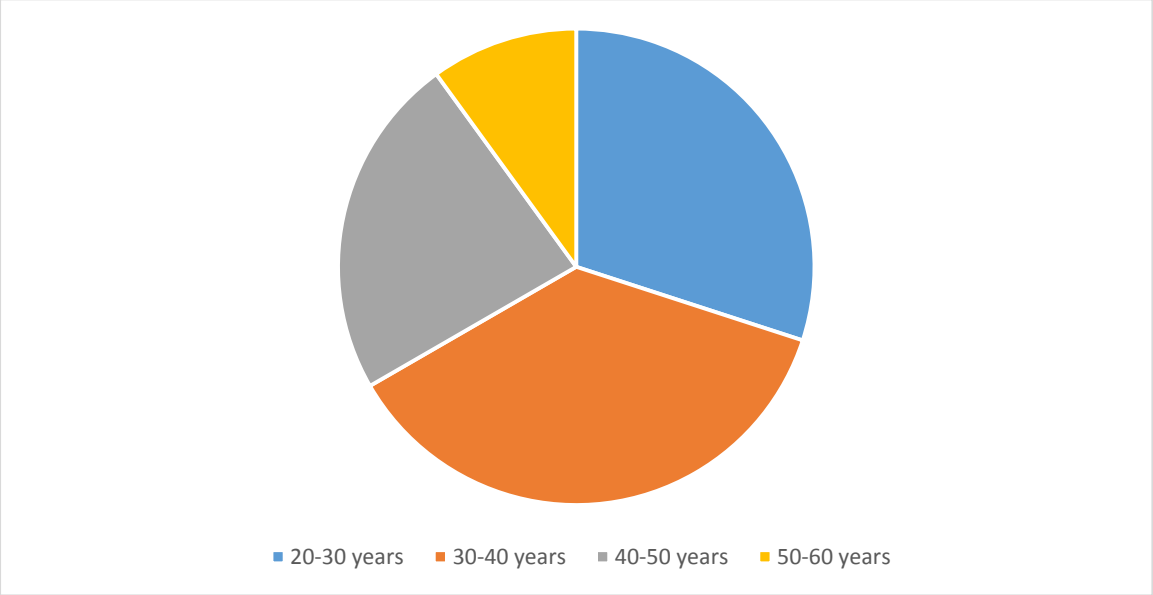
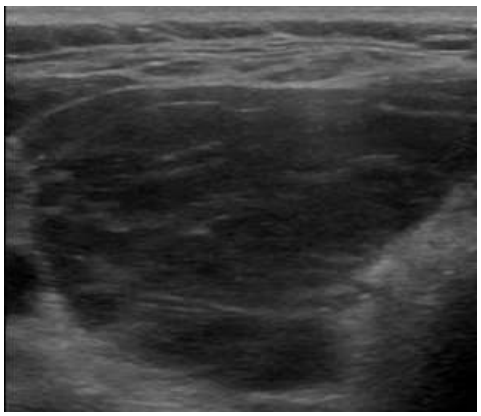


Table 3: Thyroid Pathologies:

Disease	Frequency
Hashimoto's Thyroiditis	01
Other Thyroiditis	02
MNG	16
Benign nodules	09
Atypical nodules	02

Image 1: Hashimoto's Thyroiditis



- It was confirmed by the TPO-Ab and TRAb test.

Image 2: Thyroiditis

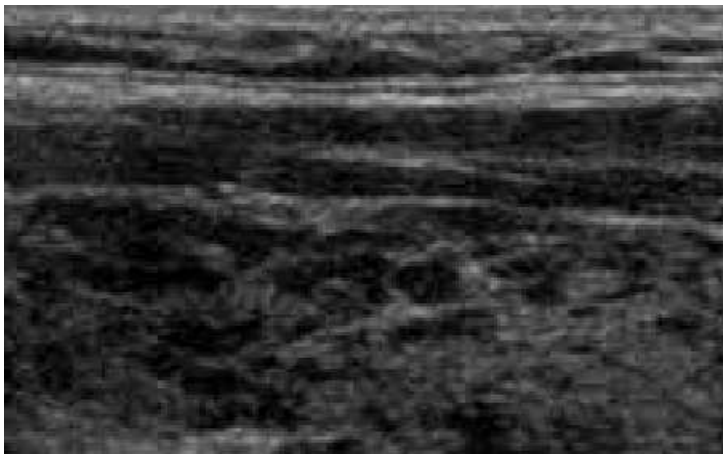


Image 3: MNG

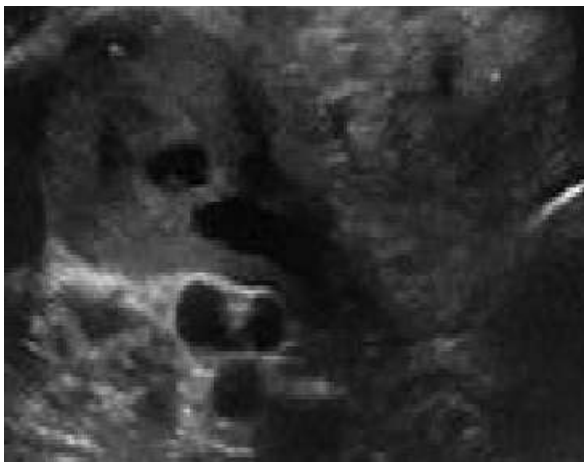


Image 4: Benign nodule

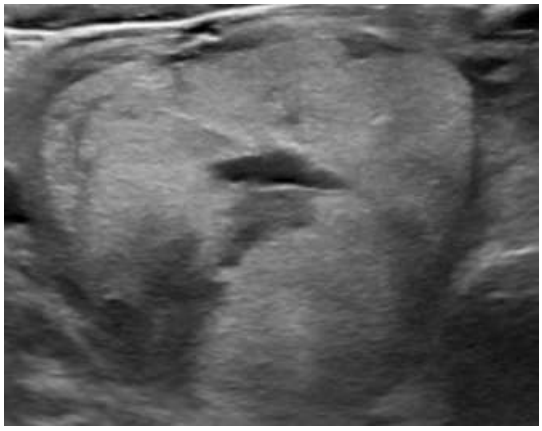


Image 5: Atypical

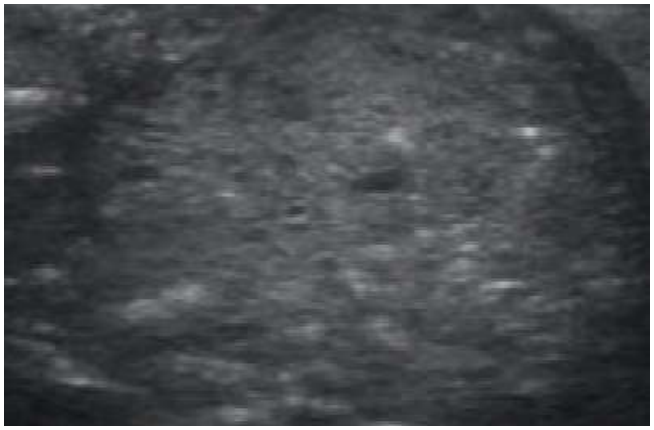


Table 4: Comparison with gold standard test

Disease	Frequency by USG	Gold standard confirmation
Hashimoto's Thyroiditis	01	02
Other Thyroiditis	02	01
MNG	16	16
Benign nodules	09	07
Atypical nodules	02	04 (malignant)

Discussion:

The common conditions that present as diffuse enlargement of the thyroid gland include multinodular goitre, Hashimoto's (lymphocytic) thyroiditis, de-Quervain's subacute thyroiditis and Graves' disease. The sonographic features of these processes may be similar but they have different biochemical profile and clinical presentations. Hence, in these conditions, ultrasound findings should be viewed in relation to clinical and biochemical status of the patient.

Multinodular goitre (MNG) is the commonest cause of diffuse asymmetric enlargement of the thyroid gland. Females between 35-50 years of age are most commonly affected. Histologically, colloid or adenomatous form of MNG is common. The ultrasound diagnosis rests on the finding of multiple nodules within a diffusely enlarged gland. A diffusely enlarged thyroid gland with multiple nodules of similar US appearance and with no normal intervening parenchyma is highly suggestive of benignity, thereby making FNA biopsy unnecessary. Most of the nodules are iso-or hyper-echoic in nature; when enlarged provide heterogeneous echo pattern to the gland. These goitrous nodules often undergo degenerative changes that correspond to their USG appearances: cystic degeneration gives anechoic appearance to the nodule, hemorrhage or infection within the cyst is seen as moving internal echoes/septations, colloidal degeneration produces comet-tail artifact, while dystrophic calcification is often course or curvilinear. Vascular compression due to follicular hyperplasia leads to focal ischemia, necrosis and inflammatory change. The assessment of nodule vascularity is very useful in differentiating MNG from multifocal carcinoma. Nodule with

intrinsic vascularity and other features of malignancy can be targeted for biopsy, in preference to other nodules.

Our study is in agreement with the other studies conducted by Chaudhary V et al [8] and Wong KT et al[9].

Conclusion:

USG is a non - invasive and non – radiational screening method. It is slowly becoming the gold standard to method of screening for thyroid pathologies.

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