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Bangladesh Journal of Ultrasonography is the Official Journal of the Bangladesh Society of Ultrasonography. The Journal is published twice in a year, in June and in December. The Journal considers manuscripts prepared in accordance with the guidelines laid down by the International Committee of Medical Journal Editors. *Br Med J* 1988; 296 (401- 405). A covering letter signed by all authors must state that the data have not been published elsewhere. If the work has been conducted abroad then the article must be accompanied by certificate from Head of the Institute where the work has been done. The Journal includes Original research papers, Case reports, Short communications, Technical notes and Letters to the editor in which all aspects of the medical use of ultrasound are presented.

All manuscripts submitted for possible publication will be reviewed and approved by the Editorial Board; the Board reserves the right to make revisions.

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Manuscripts are considered for publication with the understanding that they are submitted solely to the Bangladesh Journal of Ultrasonography.

A brief letter to the editor should be included with all submission standing the purpose and primary conclusion of the study.

The following guidelines must be adhered to :

- Manuscripts must be submitted in English.
- Two copies of manuscripts are needed and must be typed on A4 size paper on one side only, with double spacing and margins of at least 2.5 cm.
- Each manuscript component should begin on a

new page, in the following sequence : Title page, Abstract and key words, Text, Acknowledgements, References, Tables and illustrations, and Legends for illustrations.

- In an Original article, the text should be broken down into and include an Introduction, Materials and Methods, Results, and Discussion sections.
- The second page of an Original article should consist of an abstract of not more than 400 words, and three to five Key words or short phrases.
- Case reports should include an Abstract of less than 200 words, followed by three to five Key words, an Introduction, Case Report(s), and Discussion sections.
- Short communications/technical notes should be concise and contain short clinical notes or preliminary experiences.
- Letters to the Editor are welcome in response the contents previously published in the Bangladesh Journal of Ultrasonography.
- The Title page should contain 1) Title of the article; 2) First name, middle initial and last name of each author; 3) Name of Department(s) and Institutions(s); 4) Address of the principal author, or author to whom reprint requests and correspondence should be sent; 5) the source(s) of support in the form of grants; and 6) a short running title of no more than 40 characters, including letters and spaces.
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**JOURNAL ARTICLE : MORE THAN THREE AUTHORS**

2. Keogan MT, Kliever MA, Hertzberg BS, et al. Doppler sonography in the evaluation of corporovenous competence after penile vein ligation surgery. J ultrasound Med 1996; 15: 228-33

**BOOK**

3. Hayden CK, Swischuk LE. Pediatric ultrasonography, 2 ed. Baltimore, Williams & Wilkins 1992; 132-7

**CHAPTER IN A BOOK**

4. Filly RA. Ultrasound evaluation of the fetal neural axis. In : Callen CW, ed. Ultrasonography in Obstetrics and Gynecology, 2 ed. Philadelphia, WB Saunders 1988 : 95-100

**EDITED BOOK**

5. Clark RL, ed. Cancer patient care. Chicago, Year Book 1976 : 80-5

**PROCEEDINGS**

Yu CJ, Yang PC, Wu HD, et al. Ultrasound study in unilateral hemithorax opacification : Image comparison with computed tomography. Proceedings of the 17th World Congress on Diseases of the chest, 13-18 June 1993 Amsterdam, The Netherlands 1993 : 203-5.

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# New Journey of Bangladesh Journal of Ultrasonography

Mizanul Hasan, President, Bangladesh Society of Ultrasonography

**N** After a long gap, Bangladesh journal of Ultrasonography (BJU) has seen the day light again! Congratulations to the current executive body of Bangladesh Society of Ultrasonography, especially to its publication secretary Dr. Zeenat Jabin for her tireless effort to bring it out from a dead lock of six years!

Bangladesh Journal of Ultrasonography is an old reputed medical journal of Bangladesh. The journal was regularly published as 2 issues per volume and the last volume number 22 was published in 2015. The journal is an official organ of Bangladesh Society of Ultrasonography (BSU). Every professional society has some ups and down. BSU is also not an exception. Further the publication of journal was also affected due to long covid pandemic. I hope this short explanation is good enough for silence of BJU so long.

Now the volume number 23 is in your hand. We hope from now onwards the journal will be published regularly as 2 issues per volume in June and December. In fact, a good number of articles are already in hand of our publication secretary which are waiting for peer review. Hopefully the next issue will come out before June 2023.

A journal is a mirror of scientific activity of a professional community. BSU always encourage research and scientific activities in the field of medical ultrasound. Starting from 1980, ultrasonography is now available almost in every corner of the country. Every year hundreds of thousands of patients are seen by our sonologists

which is much more than any western countries. They were at significant risk during the last two years of COVID-19 pandemic because scanning usually requires close contact with patients. Our sonologists sincerely provided services even though there were risks of surface transmission as a result of frequent direct contact with large numbers of patients and limited facility of personal protection, equipment protection and decontamination. However, this powerful but non-invasive diagnostic tool efficiently proved to be an excellent modality to complement all. Moreover, bedside invasive procedures like fluid drainage and vascular access are invaluable and reliable aids that guide the clinicians readily. I personally feel that, sonologists should come forward to share and write these experiences in the form of original articles, reviews or interesting case reports and be a part of the history and reward themselves with good quality publications besides their routine works.

With the advent of internet, most of the journals are now online worldwide. In the new journey of BJU, gradually we will also switch over to online version soon. Naturally, that would enhance the process of submission for the authors as well as viewing, tracking, downloading, citing and referencing their articles after publication.

On behalf of the Bangladesh Society of Ultrasonography we expect support of our members, well-wishers and colleagues in smooth journey of BJU.

# The Dilemma Between Autoimmune and Non-Autoimmune Cause of Thyrotoxicosis During Pregnancy and Preliminary Experience of Assessment of Peak Systolic Velocity of Superior Thyroid Arteries

Md. Sunny Anam Chowdhury<sup>1</sup>, Md. Abu Shehab<sup>2</sup>, Munshi Md. Arif Hosen<sup>3</sup>, Md. Al Mamun<sup>4</sup>, Suraya Sarmin<sup>5</sup>, Nazia Tarannum<sup>4</sup>, Md. Abdul Awal<sup>6</sup>

**Objective:** To determine the differentiating role of color flow Doppler study of ultrasonography between non-autoimmune (gestational transient thyrotoxicosis) and autoimmune (Graves' disease) thyrotoxicosis in pregnant patients by assessing the peak systolic velocity of right and left superior thyroid artery.

**Methods:** The right and left superior thyroid artery peak systolic velocity of 24 thyrotoxic (17 with gestational transient thyrotoxicosis and 7 with Graves' disease) pregnant women and 15 age-sex matched healthy euthyroid subjects were assessed with color flow Doppler ultrasonography.

**Results:** The mean right and left superior thyroid artery peak systolic velocities were significantly higher in patients with Graves' disease than the patients with gestational transient thyrotoxicosis and euthyroid subjects. The right and left superior thyroid artery peak systolic velocities of patients with Graves' disease were also positively correlated with TPO antibody levels.

**Conclusion:** Peak systolic velocity study of superior thyroid artery by ultrasonography can be an acceptable alternative diagnostic method for the differentiation of thyrotoxicosis during pregnancy even in rural areas where other modality are not available. More studies are needed for further evaluation of the diagnostic accuracy of STA-PSV for the differential diagnosis of thyrotoxicosis during pregnancy.

**Keywords:** Gestational transient thyrotoxicosis, Graves' disease in pregnancy, Peak systolic velocity, superior thyroid artery

Thyrotoxicosis in pregnancy is a special clinical situation that may affect about 0.1% to 0.4% of pregnancies. The physiological changes in pregnancy state challenge the interpretation of thyroid function tests and possible complications related to the disease and/or its treatment may compromise the health of the pregnant woman

and also the developing fetus (1,2). The main autoimmune cause of thyrotoxicosis during pregnancy is Graves' disease (GD), which need an earlier treatment. In contrast, gestational transient thyrotoxicosis (GTT) is a non-autoimmune cause of thyrotoxicosis of variable severity that often associated with hyperemesis gravidarum (HG) during early pregnancy with a lack of clinical features of GD, no evidence of hyperthyroidism before pregnancy, an absence of thyroid autoantibodies and usually resolves spontaneously within 18 weeks of gestation (3). The other causes of thyrotoxicosis as toxic multinodular goiter, solitary toxic adenoma or different

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destructive thyroiditis are rare during pregnancy. So, it is important to differentiate between autoimmune and non-autoimmune thyrotoxicosis.

Thyrotoxicosis with clinical features of GD is easy to diagnose. But to differentiate GD and GTT with nonspecific features of hyperthyroidism which are common in pregnancy is difficult. The new generation thyroid stimulating hormone-receptor antibody (TRAb) assay is highly sensitive and specific for discriminating GD from various causes of thyrotoxicosis (4,8). But this assay is not widely available and being very costly not suitable in routine clinical practice. Again, radioactive iodine uptake (RAIU) (gold standard for GD), radioisotope thyroid scan are very useful nuclear medicine tools to diagnosis GD, but contraindicated during pregnancy due to ionizing radiation effects (5).

An increased vascularity of thyroid gland and raised peak systolic velocity (PSV) of superior thyroid artery are characterized in Graves' disease (6). Hence, color Doppler study of thyroid gland and the measurement of mean peak systolic velocity of superior thyroid artery (STA-PSV) by ultrasonography, which is easier and convenient, can provide qualitative and quantitative information to clinicians in discriminating thyrotoxicosis. A good number of studies with over 1000 cases from Asia showed, STA-PSV by ultrasonography as a useful diagnostic method for the differential diagnosis of thyrotoxicosis (7). We therefore, conducted the present study to assess the STA-PSV of 24 thyrotoxic pregnant women in our institute for differentiating role of Color Flow Doppler Study (CFDS) by ultrasonography in GD and GTT.

## **PATIENTS AND METHODS**

### ***Patients***

Twenty four pregnant women (N=24) in their first trimester of pregnancy (between 8-12 weeks

gestation) who were referred to our center for evaluation of thyrotoxicosis and 15 age and sex-matched healthy euthyroid subjects were enrolled in this study. All of the cases were newly diagnosed and had not received antithyroid therapy before. A detailed history was taken and all patients with thyrotoxicosis were examined physically for clinical features of GD (ophthalmopathy, a significant goiter, pretibial myxedema and nail changes). Patients with a history of previous thyroid surgery, radioactive iodine ablation therapy and radiation exposure to the neck; patients with single or multinodular goiter on gray-scale ultrasonography (USG); patients with destructive thyroiditis; and patients under treatment with L-thyroxine were excluded from the study. GTT was defined as suppressed thyroid stimulating hormone (TSH) and high free thyroid hormone (FT3, FT4) levels presenting within the first trimester of pregnancy and usually associated with HG, but self-limiting on follow-up; absence of clinical findings of GD; a normal thyroid peroxidase antibodies (TPOAb) level; and absence of a history of hyperthyroidism before pregnancy. HG was defined as electrolyte disturbances, ketosis and weight loss of 0.5% of the non-pregnant weight. GD in pregnant patients was defined based on clinical findings, high TPOAb and free thyroid hormone levels, decreased TSH levels and may or may not have a history of hyperthyroidism before pregnancy. Maternal thyroid function was monitored with respect to FT3, FT4 and TSH levels at regular intervals. All pregnant patients diagnosed with GTT were followed up until the normalization of the TSH level with only symptomatic treatment of HG without treatment with antithyroid drugs. Antithyroid therapy was administered to all pregnant patients diagnosed with GD and the patients were followed up regularly. After initial diagnosis and subsequent follow-up, 17 patients

were finally diagnosed as GTT and 7 was diagnosed as GD in this study. The mean age of the patients with GTT was  $20.4 \pm 4.2$  years, the patients with GD was  $24.5 \pm 5.3$  years and healthy euthyroid subjects was  $22 \pm 3.2$  years. Informed consent was obtained from all participants and the study was approved by the local ethics committee.

### **Hormone assays**

Serum samples to determine TSH, FT3 and FT4 levels for all subjects; TPOAb level in all patients with thyrotoxicosis were collected for laboratory assessment on the day of ultrasonography examination. Serum TSH, FT3, FT4 and TPOAb levels were assessed using radioimmunoassay method.

### **Doppler ultrasonography**

All thyroid ultrasound examinations were performed by the same sonologist, who was blinded to the clinical status of the subjects. A color Doppler ultrasound scanner (Samsung HS40) equipped with a 7-14 MHz broadband linear array transducer was used. The STA was selected for Doppler study and flow in the thyroid artery was reported in centimeters per second from Doppler spectrum. The angle correction cursor was parallel to the direction of flow and the Doppler angle was kept at or below  $60^\circ$ . The PSV value were obtained for the study from both right and left STA.

### **Statistical analysis**

Data were analyzed using SPSS version 8.0.0 for Windows (SPSS Inc., Chicago, IL). Scale variables are presented as the mean  $\pm$  standard deviation (mean  $\pm$  SD). Categorical data were evaluated using Chi-square analysis. Student's t-test was used for a comparison of parametric quantitative data. A canonical correlation analysis was used to determine the correlation between the STA-PSV value and the TPOAb level in patients with GD.  $P < 0.05$  was considered to be statistically significant.

## **RESULT**

All the demographic, laboratory and sonographic data of the study participants are summarized in Table-1.

Table-1: Demographic information, laboratory values and PSV of STA of the study participants.

	Patients with GTT n=17	Patients with GD n=7	Healthy euthyroid subjects n=15	P value
Age (year)	20.4 $\pm$ 4.2	24.5 $\pm$ 5.3	22 $\pm$ 3.2	-
Hyperemesis gravidarum (%)	88.2	28.5	-	0.003468
TSH (0.3-5.0 mIU/l)	0.04 $\pm$ 0.03	0.01 $\pm$ 0.002	2.2 $\pm$ 0.92	-
FT3(2.8-9.5 Pmol/L)	11.4 $\pm$ 3.8	17.68 $\pm$ 6.1	4.8 $\pm$ 2.6	-
FT4 (9.5-25.5 Pmol/L)	29.6 $\pm$ 4.6	38.2 $\pm$ 7.2	11.3 $\pm$ 4.2	-
Anti TPOAb ( $\leq$ 15 IU/ml)	10.3 $\pm$ 5.8	328.5 $\pm$ 128.3	-	<0.0001
Right STA PSV (cm/sec)	17.3 $\pm$ 3.7	39.8 $\pm$ 11.8	14.4 $\pm$ 4.3	-
Left STA PSV (cm/sec)	16.6 $\pm$ 4.6	38.2 $\pm$ 12.3	14.8 $\pm$ 5.4	-

In our study, the initial mean right and left STA-PSV were significantly higher in patients with GD than the patients with GTT and euthyroid subjects ( $p < 0.0001$ ). The study also showed significantly different TPOAb level between patient with GD and GTT ( $p < 0.0001$ ). However, patients with GTT has slightly higher mean PSV level than euthyroid subjects ( $p = 0.3166$  in left STA-PSV, not significant and  $p = 0.0491$  in right STA-PSV, significant). There was no significant difference of PSV value of right and left STA in any subject of GD, GTT or euthyroid state. We also observed a positive correlation between the TPOAb and STA-PSV in patients with GD ( $r = 0.657$ ,  $p = 0.108$  for right STA-PSV and  $r = 0.625$ ,  $p = 0.125$  for left STA-PSV)