

Thyroid Disorders in Pregnancy

Department of Endocrinology



Presenter:

- **Dr. Mohammad Moin Shahid**
- **Associate Professor and Head**
- **Department of Endocrinology**
- **Ad-din Women's Medical College, Mogbazar, Dhaka**

1

- **A pregnant woman with 14 weeks of gestation has reported to the Endocrine outpatient department with complaints of nausea, anorexia, and weakness. Her TSH report is 0.07 mIU/L (0.4- 5.5 mIU/L), F.T4 – 1.0 ng/dl (0.9-1.7 ng/dl).**

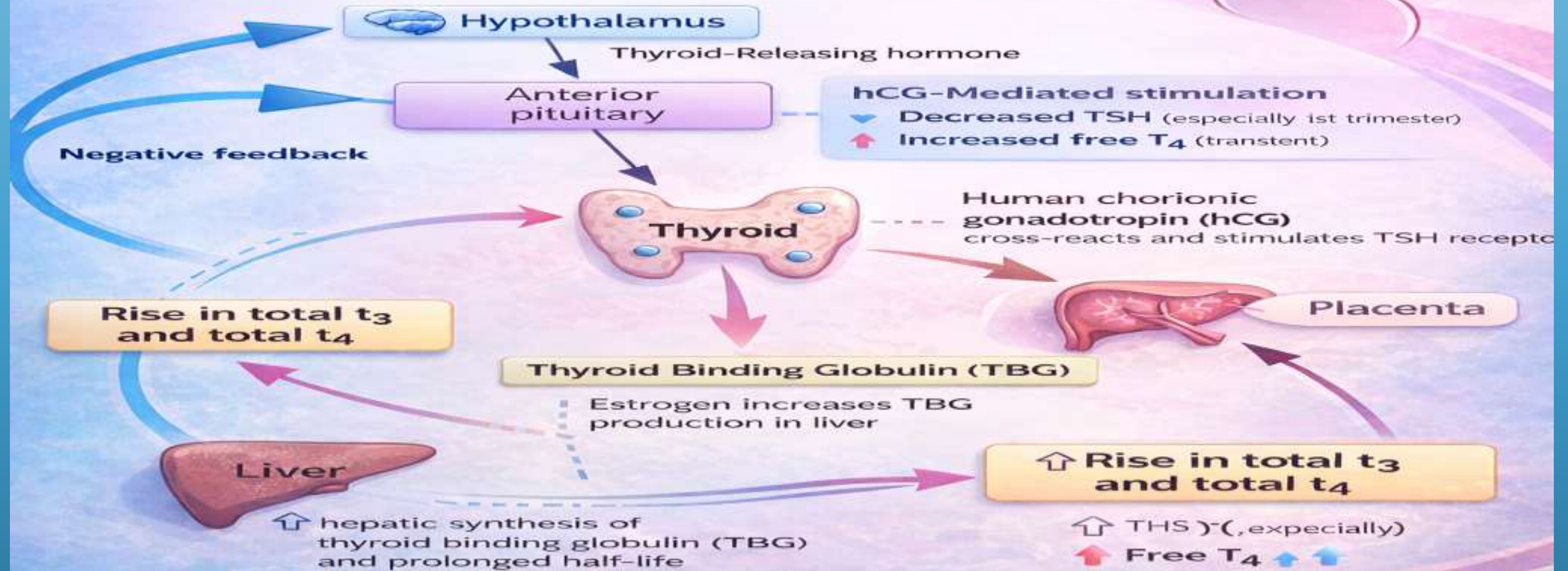
2

- A pregnant woman with 34 weeks of gestation has come to the Endocrine outpatient department to consult regarding her thyroid status. Her TSH is 0.02 mIU/L (0.4-5.5 mIU/L), and T.T4 is 15 µg/dl (5.0-12 µg/dl).

3

- A woman with 17 weeks of pregnancy attended the Endocrine Outpatient department with her thyroid function tests. She has stated recently that she has recovered from the flu, and she is not on levothyroxin replacement. Her thyroid status is as follows: TSH-0.20 mIU/L (0.4-5.5 mIU/L), F.T4- 0.8 ng/dl (0.9-1.7 ng/dl).

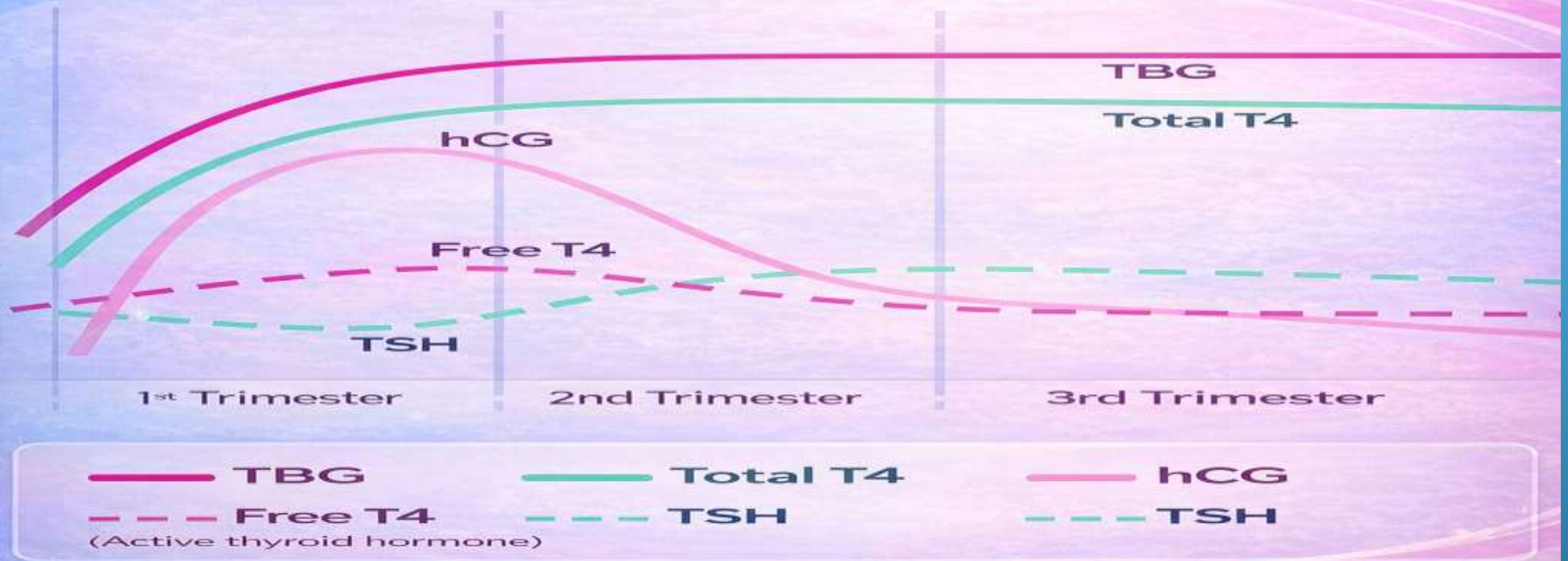
Physiological Changes of **THYROID HORMONES** DURING PREGNANCY



when?

When?

When do maternal thyroid hormone levels change during pregnancy?



Prevalance of Thyroid Disorders



WHERE?



Thyroid disorders in arsenic prevalent area in Bangladesh

ABSTRACT

Background and Objectives: Due to geographical position and geological nature, Bangladesh (BD) has been the worst affected country in the world by arsenic contamination. The aim of this study was to highlight the association of chronic arsenic intoxication with thyroid disorders (TDs).

Materials and Methods: This cross-sectional study was conducted from March 2019 to February 2020 at Ad-din Women's Medical College and Hospital. One thousand one hundred and thirty-seven patients were randomly selected, who visited the outpatient departments of medicine faculty with thyroid-stimulating hormone test report. Rest of the thyroid function tests were done if required. Considering the arsenic level in irrigation and drinking water, 64 districts of BD were divided into two regions "arsenic prevalent area" and "less arsenic prevalent area" and patients hailing from those areas were divided as Group 1 and Group 2, respectively. All patients were subjected to history taking and physical examination. Chi-square test and one-way ANOVA test were used to compare the variables.

Results: Prevalence of TD were significantly higher in Group 1 (60.14%; $P = 0.001$) and so was the prevalence of goiter (19%; $P = 0.021$). Older (31.17 ± 9.81 ; $P = 0.001$) and female patients (94.92%; $P = 0.001$) were more prone to develop TD.

Conclusion: It will require more studies at larger scale for better understanding of the association of thyroid disorders with chronic arsenic intoxication.

Keywords: Arsenic intoxication, geography, geology, thyroid disorder

BACKGROUND

Bangladesh (BD) is a land of rivers. Most parts of BD are deltaic areas and flood plains. Due to geographical position and geological nature, the groundwater of BD is highly contaminated with arsenic (As)-in fact, the worst in the world.^[1-3] Arsenic has many harmful effects on the human body.^[2-9] Thyroid disorder (TD) is one of the most common endocrine disorders in BD and researches have showed that arsenic has direct and indirect role in the development of TD. Despite being the most arsenic-contaminated country in the world, BD do not have any study co-relating arsenic and TD. The aim of this study to highlight the effect of chronic arsenic intoxication on TD.

MATERIALS AND METHODS

This is a cross-sectional study which was conducted from March 2019 to February 2020 at Ad-din Women's Medical College a Tertiary Care Hospital in Dhaka, BD. One thousand one hundred

and thirty-seven patients were randomly selected, who visited the outpatient departments of medicine faculty with thyroid function test report- thyroid-stimulating hormone (TSH). Free triiodothyronine (FT3)/total triiodothyronine (TT3), free thyroxine (FT4)/total thyroxine (TT4), thyroid peroxidase antibody (TPOAb), and thyroglobulin antibody (TgAb) levels were checked when required. Thyroid status was classified according to TSH value- euthyroidism,

MOHAMMAD MOIN SHAHID, KHADIZA BEGUM¹, KANIZ RAHMAN², HOSNEA ARA³, SHARMIN FERDOUSI⁴, RICHMOND RONALD GOMES¹

Departments of Endocrinology, ¹Internal Medicine, ²Dermatology and ³Psychiatry, Ad-din Women's Medical College, ⁴Department of Pathology, Dr. Sirajul Islam Medical College, Mogbazar, Dhaka, Bangladesh

Address for correspondence: Dr. Mohammad Moin Shahid, Department of Endocrinology, Ad-din Women's Medical College, Mogbazar, Dhaka, Bangladesh.
E-mail: dr.ms952@gmail.com

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 license, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Shahid MM, Begum K, Rahman K, Ara H, Ferdousi S, Gomes RR. Thyroid disorders in arsenic prevalent area in Bangladesh. *Thyroid Res Pract* 2021;18:19-22.

Received: 27-Mar-2021

Accepted: 06-Apr-2021

Published: 04-Sep-2021

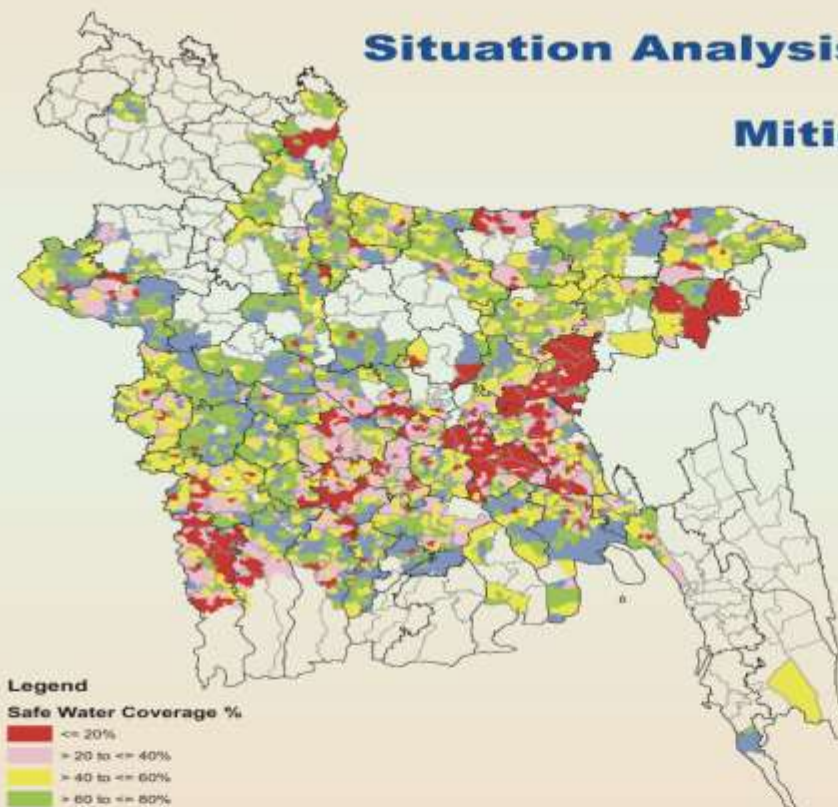
Access this article online.	
Website: www.thetrp.net	Quick Response Code
DOI: 10.4103/trp.4_21	



LOCAL GOVERNMENT DIVISION
MINISTRY OF LGRD AND COOPERATIVES
GOVERNMENT OF PEOPLE'S REPUBLIC OF BANGLADESH

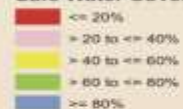
Situation Analysis of Arsenic

Mitigation 2009



Legend

Safe Water Coverage %

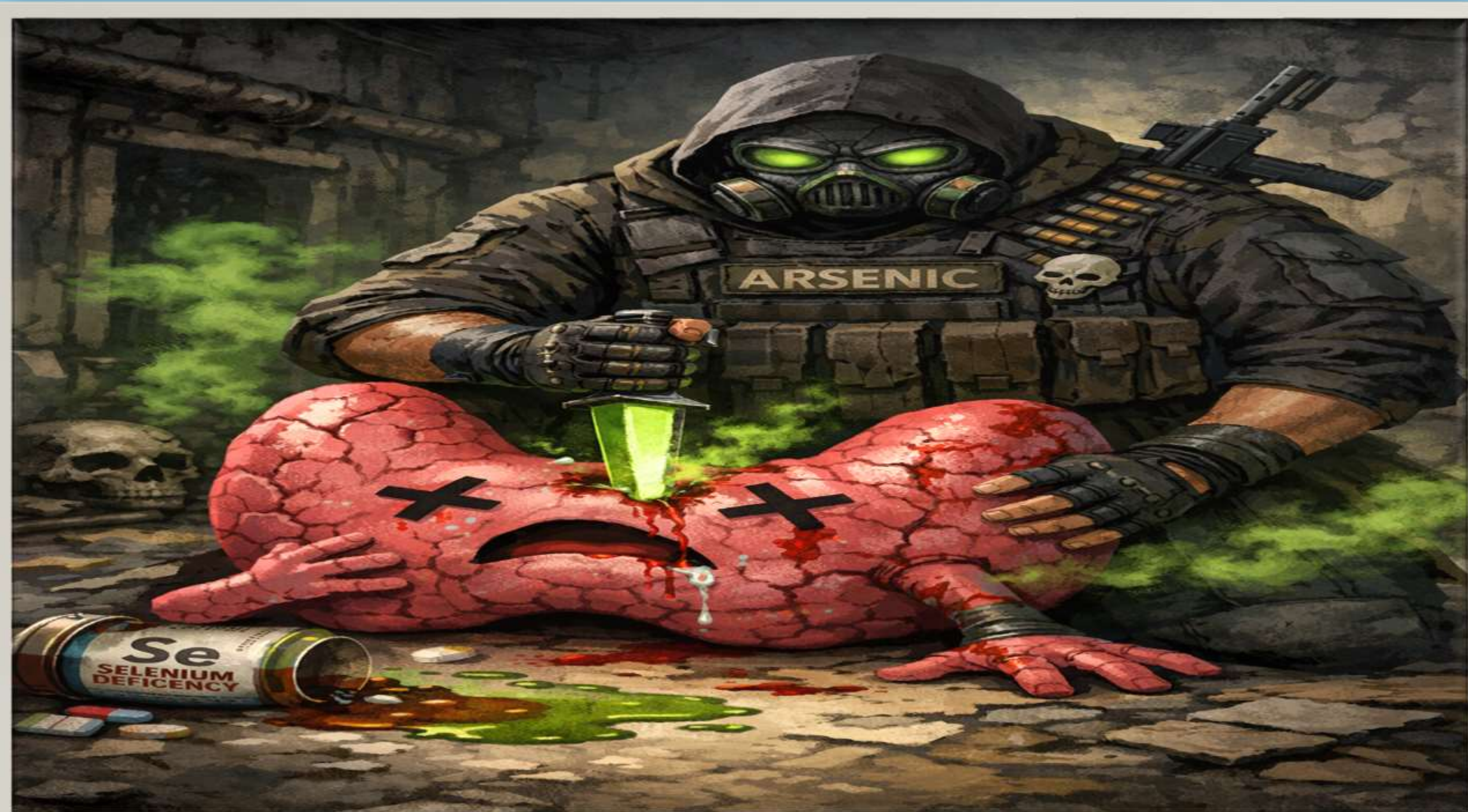


June 2010



DEPARTMENT OF PUBLIC HEALTH ENGINEERING
&
JAPAN INTERNATIONAL COOPERATION AGENCY





what?



Prevalence and incidence of thyroid disorder during pregnancy in Bangladesh - a tertiary care hospital based study

Shahid M M¹, Ferdousi S²

¹Department of Endocrinology, Ad-din women's Medical college, Mogbazar, Dhaka.

²Department of Pathology, Dr. Sirajul Islam Medical College, Mogbazar, Dhaka.

Abstract

Objectives: To establish the prevalence and incidence of thyroid dysfunction during pregnancy in a tertiary care center in Bangladesh.

Methodology: 749 cases were randomly selected among the pregnant women who reported to antenatal clinic. Later 121 women were excluded as they were already diagnosed cases of thyroid disorder. The rest were investigated for thyroid stimulating hormone (TSH) and if required then they were also investigated for free triiodothyronine (FT3), free thyroxine (FT4), and thyroid peroxidase antibody (TPOAb). Thyroid status was classified according to TSH level – euthyroidism, subclinical hypothyroidism, overt hypothyroidism and hyperthyroidism (sub-clinical hyperthyroidism, Graves' disease/toxic multinodular goiter, transient hyperthyroidism of pregnancy). And all patients were divided into 2 groups – normal/euthyroidism and abnormal/thyroid disorder, considering their thyroid status.

Result: The prevalence of thyroid disorder during pregnancy was 34.98% and incidence was 22.45%. The mean TSH levels ($\mu\text{IU/mL}$) of 1st, 2nd and 3rd trimester were 2.67 ± 3.59 , 2.39 ± 1.87 and 2.74 ± 3.98 , respectively. Significant number of overt hypothyroid cases were detected among rural people ($P = 0.004$). There were significant difference of incidence of euthyroid ($P = 0.029$) and SCHTh ($P = 0.031$) cases at different stages of gestation. There were also significant number of cases with goiter ($P < 0.001$) and TPOAb ($P < 0.001$) in different patient groups.

Conclusion: Thyroid disorders are common in pregnancy. Early detection and proper treatment of thyroid dysfunction can help for better outcome. Hence, thyroid function test must be advised to all pregnant women.

Keywords: Pregnancy, euthyroidism, subclinical hypothyroidism, overt hypothyroidism and hyperthyroidism.

Correspondence email: dr.ms952@gmail.com

 <https://orcid.org/0000-0003-4797-2686>



This is an open-access article distributed under the terms of the [Creative Commons Attribution License](https://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited (CC BY 4.0)

Results

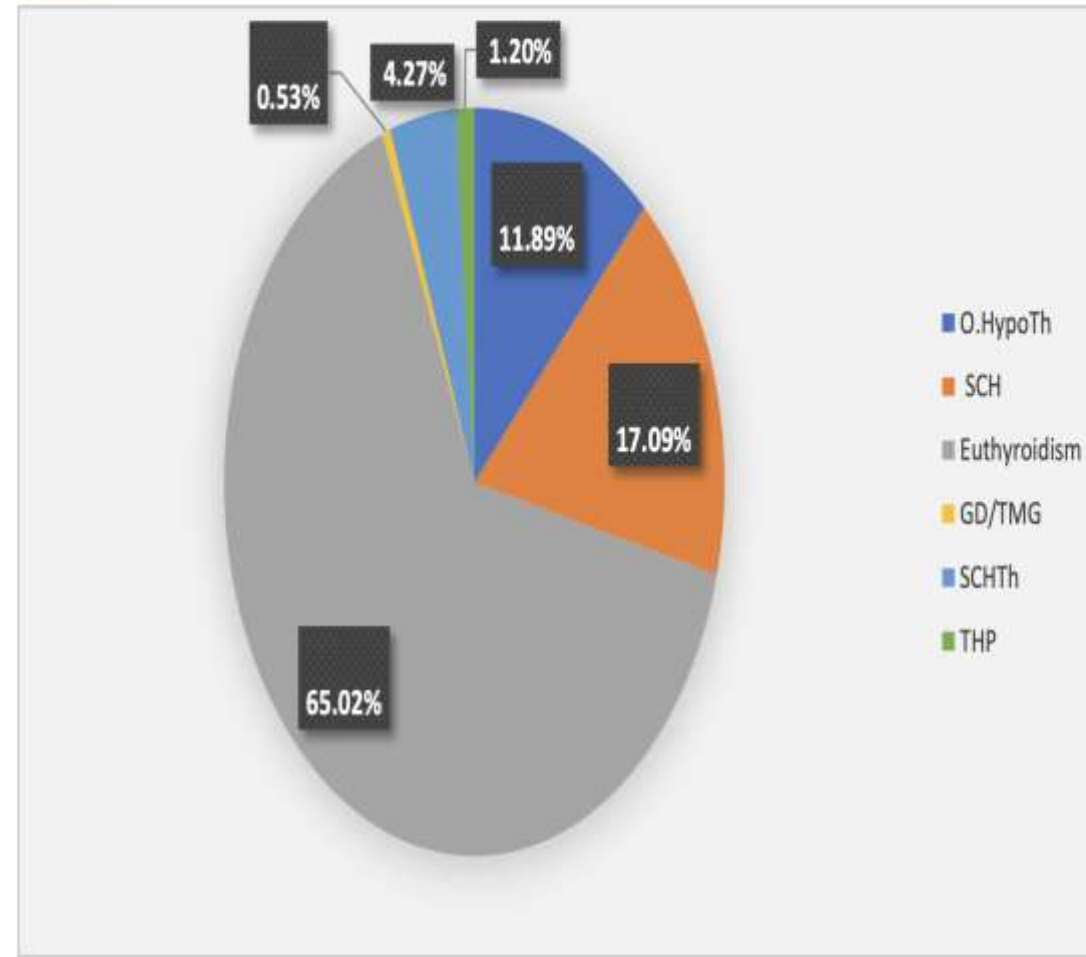


Figure 1: Prevalence of thyroid disorder during pregnancy.
The prevalence of thyroid disorder during pregnancy was 34.98% (n = 749).

Low TSH

❖ Differential diagnosis:

- Transient hyperthyroidism of pregnancy
- Sick euthyroid syndrome
- Secondary hypothyroidism
- Subclinical hyperthyroidism
- Overt hyperthyroidism – GD, TMG, Thyroiditis

Normal TSH

❖ Differential diagnosis:

- Euthyroidism
- Hypothyroxinaemia
- Isolated TSH deficiency
- Secondary hypothyroidism
- Sick euthyroid syndrome

High TSH

❖ Differential diagnosis:

- Subclinical hypothyroidism in pregnancy
- Subclinical hypothyroidism
- Overt hypothyroidism
- Secondary hyperthyroidism

Low TSH		
High F.T4/T.T4, F.T3/T.T3	Normal F.T4/T.T4, F.T3/T.T3	Low F.T4/T.T4, F.T3/T.T3
Transient hyperthyroidism of pregnancy	Subclinical hyeprthyroidism	Secondary hypothyroidism
Grave's disease	Sick euthyroid syndrome	Sick euthyroid syndrome
Toxic multinodular goiter		
Toxic nodule		

Normal TSH

High F.T4/T.T4, F.T3/T.T3	Low F.T4/T.T4, F.T3/T.T3
Thyroxin therapy – poor adherence	Secondary hypothyroidism
Heparin therapy	Hypothyroxinemia
Familial dysalbuminemic hyperthyroxinemia	Sick euthyroid syndrome

High TSH

Low F.T4/T.T4, F.T3/T.T3 (TSH ≥ 10)	Normal F.T4/T.T4, F.T3/T.T3 (TSH – 4-5.5)	Normal F.T4/T.T4, F.T3/T.T3 (TSH – >5.5- <10)	High F.T4/T.T4, F.T3/T.T3
Overt hypothyroidis m	Subclinical hypothyroidis m of pregnancy	Subclinical hypothyroidis m	Secondary hyperthyroidism

Thyroid hormone status during pregnancy in Bangladesh

ABSTRACT

Background: Pregnancy is a physiological condition where early detection of any pathological change of thyroid hormone is very important to prevent complications. Population-specific thyroid hormone reference intervals are a key to this. Since Bangladesh is yet to develop such reference intervals, the aim of this study was to establish trimester-specific reference intervals addressing the physiological changes of thyroid hormone during pregnancy for Bangladeshi women.

Materials and Methods: One thousand nine hundred and thirty-seven women with singleton pregnancy consuming iodinated salt were selected for this cross-sectional study. Participants having a history of thyroid disorder (TD), any illness influencing thyroid function, presence of goiter, recent history of consumption of thyroid status-altering medications, family history of TDs, and presence of thyroid antibodies were excluded from the study. 1038 pregnant women with thyroid-stimulating hormone (TSH) level within normal (nonpregnant) laboratory reference value (0.35–5.5 µIU/mL) were considered eligible for the study.

Results: The mean age of the eligible cases was 28.06 ± 4.633 years ranging from 18 years to 42 years. The mean gestational ages of the study population while checking thyroid function were 8.83 ± 2.344 weeks, 19.99 ± 4.824 weeks, and 31.77 ± 2.123 weeks during 1st, 2nd, and 3rd trimesters, respectively. TSH level raised significantly from 1st trimester to 2nd trimester (1.85 ± 1.00 vs. 2.03 ± 1.02 ; $P = 0.018$) but the decline in 3rd trimester comparing to 2nd trimester (2.03 ± 1.02 vs. 1.90 ± 0.90 ; $P = 0.071$) was not statistically significant. The 2.5th–97.5th percentiles of TSH level of the study population were 0.440–4.050 µIU/mL, 0.531–4.570 µIU/mL, and 0.622–3.917 µIU/mL in 1st, 2nd, and 3rd trimesters, respectively.

Conclusion: Reliance on nonpregnant reference intervals or any generalized gestational reference interval can hinder the desired progression of pregnancy influencing diagnosis and management for TDs in case of certain populations. Establishment of individual reference intervals for thyroid hormone in pregnancy bears great clinical importance for every population.

Keywords: Pregnancy, reference interval, thyroid disorder, thyroid-stimulating hormone, trimester

INTRODUCTION

Thyroid disease is the second most common endocrine disease to affect pregnancy.^[1–3] Pregnancy may lead to initiation or aggravation pathophysiological changes of thyroid hormone affecting the fetomaternal thyroid hormone balance.^[3,4] Changes of thyroid hormone status during pregnancy are part of normal physiology. However, the detecting pathological changes from the physiological changes often proves to be difficult during pregnancy as those changes are influenced by multiple factors—gestational age, ethnicity, investigation methods, geographical position, and nutritional status of the population. Hence, it is a necessity to establish individualized thyroid hormone reference intervals for the different populations across the world for better management of thyroid related complications during pregnancy. Since there

are no such reference intervals in Bangladesh yet, the aim of this study was to address the physiological change of thyroid status during pregnancy for Bangladeshi people and establish trimester-specific reference intervals for thyroid hormone.

MOHAMMAD MOIN SHAHID, FATEMA BINTE ISLAM¹, SHAMIMA BEGUM²

Departments of Endocrinology and ¹Gynaecology and Obstetrics, Ad-Din Women's Medical College and Hospital, Dhaka, Bangladesh

Address for correspondence: Dr. Mohammad Moin Shahid, Department of Endocrinology, Ad-Din Women's Medical College and Hospital, Dhaka, Bangladesh.
E-mail: dr.me952@gmail.com

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 license, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLPMedknow_reprints@wolterskluwer.com

How to cite this article: Shahid MM, Islam FB, Begum S. Thyroid hormone status during pregnancy in Bangladesh. *Thyroid Res Pract* 2021;18:116–20.

Received: 28-Sep-2022

Revision: 13-Nov-2022

Accepted: 26-Nov-2022

Published: 15-Feb-2023

Access this article online	
Website: www.thrp.net	Quick Response Code
DOI: 10.4103/thrp.15_22	



Association of gestational diabetes mellitus and thyroid status during pregnancy: a cross-sectional study in a tertiary health care center of Bangladesh

Mohammad Moin Shahid , K. M. Thouhidur Rahman , Richmond Ronald Gomes , Menoka Ferdous , Sharmin Ferdousi & Tamannur Zahan

To cite this article: Mohammad Moin Shahid , K. M. Thouhidur Rahman , Richmond Ronald Gomes , Menoka Ferdous , Sharmin Ferdousi & Tamannur Zahan (2020): Association of gestational diabetes mellitus and thyroid status during pregnancy: a cross-sectional study in a tertiary health care center of Bangladesh, Gynecological Endocrinology, DOI: 10.1080/09513590.2020.1866531

To link to this article: <https://doi.org/10.1080/09513590.2020.1866531>



Published online: 28 Dec 2020.



Submit your article to this journal [↗](#)



View related articles [↗](#)



View Crossmark data [↗](#)

Complications of Hypothyroidism

Maternal	Fetal
Anemia	Early fetal loss
Gestation induced hypertension	Cretinism
Pre eclampsia	Preterm delivery
Placental abruption	Still birth/ perinatal death
Increased placental weight	Low birth weight
Increased frequency of C/S	Fetal distress during labor

Complications of Hyperthyroidism

Maternal	Fetal
Heart failure	Neonatal mortality
Pre eclampsia	IUGR
GDM	Preterm delivery
	Still birth



Thank you.....