American Journal of Medicine and Medical Sciences 2025, 15(6): 1737-1739
DOI: 10.5923/j.ajmms.20251506.22

Subclinical Hypothyroidism as a Predictor of Gestational Diabetes

Nasirova Shaxlo Shukhratovna

Bukhara State Medical Institute named after Abu Ali ibn Sina, Bukhara, Uzbekistan

Abstract It is currently projected that 1 in 3 adults in the United States (USA) will have diabetes by 2025. The growing prevalence of type 2 diabetes is increasing significantly among adults, especially among young women of reproductive age who are diagnosed with this disease during pregnancy. The study is a prospective follow-up of 109 pregnant women since the detection of GDM. The diagnosis of subclinical hypothyroidism (CH) was made based on the levels of thyroid-stimulating hormone (TSH, >2.5 mED/L), as well as the presence of antibodies to thyroperoxidase (anti-TPO). Despite the pre-pregnancy euthyroid status in the presence of autoantibodies to thyroperoxidase and thyroglobulin, the increasing functional load on the thyroid gland during pregnancy contributes to the development of hypothyroidism.

Keywords Gestational diabetes mellitus, Subclinical hypothyroidism, Anti-TPO, Thyroid-stimulating hormone

1. Introduction

The International Diabetes Federation (IDF) estimated that more than 425 million people worldwide were diagnosed with diabetes in 2017 and that this number is projected to rise to 629 million by 2045 (World Health Organization, 2006) [4]. It is currently projected that 1 in 3 adults in the United States (USA) will have diabetes by 2025. The growing prevalence of type 2 diabetes mellitus is increasing significantly among adults, especially among young women of reproductive age who are diagnosed with this disease during pregnancy [5]. The prevalence of gestational diabetes mellitus (GDM) worldwide ranges from 5% to 25.5% and depends on race, ethnicity, age, physique, as well as screening and diagnostic criteria [6]. In the United States, approximately 1 out of every 10 pregnant women suffers from this disease, and almost 90% of cases of diabetes during pregnancy are associated with GDM [7]. The prevalence of GDM in Asian women is higher [8] than in US women. India ranks second in the world in terms of the number of diabetic patients and is one of the global epicenters of the diabetes epidemic. Diabetes mellitus is divided into three types: (1) Type 1 diabetes mellitus, (2) Type 2 diabetes mellitus (T2DM2), and (3) Gestational diabetes mellitus (GDM). In 90-95% of cases of diabetes mellitus in adults, T2DM was detected [4]. Diabetes during pregnancy causes permanent disorders of both maternal health and fetal growth [8].

* Corresponding author:
info@bsmi.uz (Nasirova Shaxlo Shukhratovna)
Received: May 2, 2025; Accepted: May 25, 2025; Published: Jun. 5, 2025
Published online at http://journal.sapub.org/ajmms

The purpose of the study consists to study the early diagnosis and metabolic abnormalities in gestational diabetes and to develop appropriate tactics for managing pregnancy and childbirth.

2. Material and Methods

The examination and assessment of the patients' condition were carried out in accordance with the recommendations of WHO experts for the practical healthcare system [WHO, Geneva, 2012]. The study is a prospective follow-up of 109 pregnant women since the detection of GDM (Figure 1).

In accordance with the objectives of the study, a pregnancy screening program was developed (Figure 2).

3. Results and Analyses

An analysis of the study results showed that in the control group, the average age of the surveyed pregnant women was 25 (22.0–27.5) years (Table 1).

Table 1. The age of the patients at the time of delivery

Groups	Age, full years		
	Me, Q_1–Q_3	Min	Max
Control group (n=39)	25 (22,0–27,5)	19,0	35,0
Group 1 (n=30)	27,5 (22,0–32,8)	18,0	37,0
Group 2 (n=35)	31** (27,0–34,5)	23,0	37,0

Note:* ** – the differences between the control group and group 1 are statistically significant

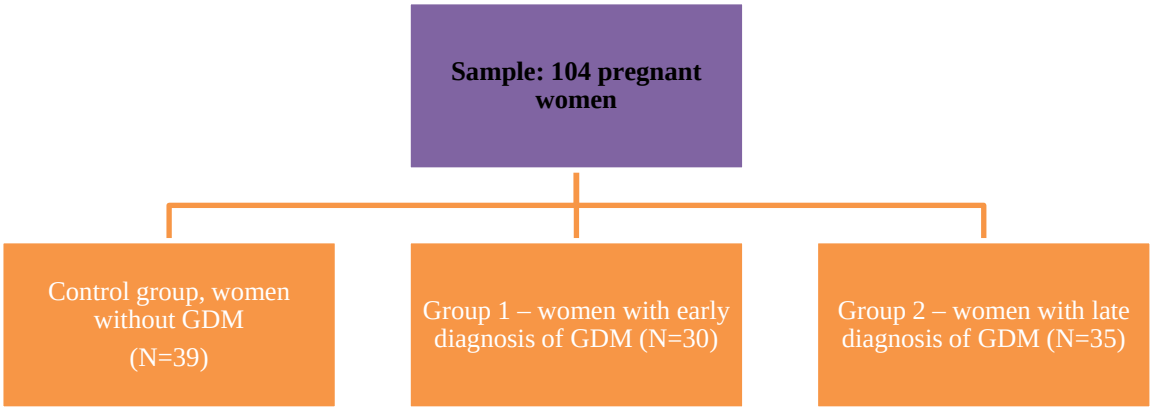

Figure 1. Research design

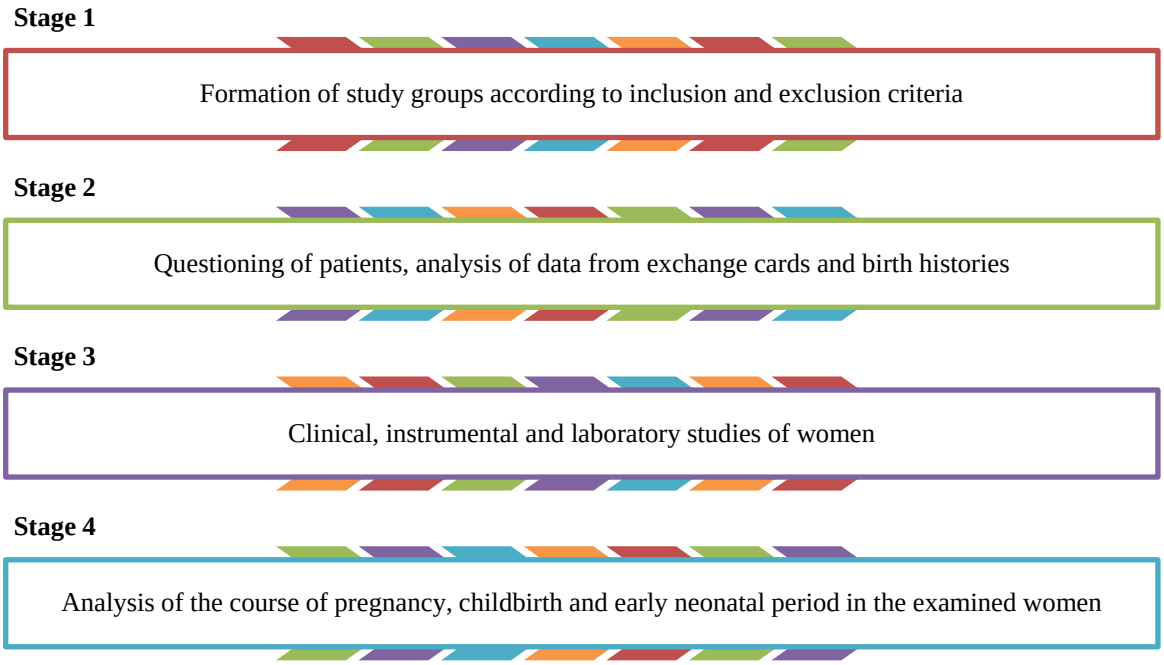

Figure 2. Research program

When comparing the age groups, it was found that patients with late diagnosis of GDM were statistically significantly older - 31 years (27.0–34.5 years) than in the other two ($p<0.01$ when compared with the control group, $p=0.02$ when compared with group 2) Between the group with early diagnosis of GDM and the control group, statistically no significant differences were found ($p=0,463$): 27,5 (22,0–32,8) years and 25 (22.0–27.5) years, respectively.

The diagnosis of subclinical hypothyroidism (CH) was made based on the levels of thyroid-stimulating hormone (TSH, >2.5 mED/L), as well as the presence of antibodies to thyroperoxidase (anti-TPO). Despite the pre-pregnancy euthyroid status in the presence of autoantibodies to thyroperoxidase and thyroglobulin, the increasing functional load on the thyroid gland during pregnancy contributes to the development of hypothyroidism (Figure 3).

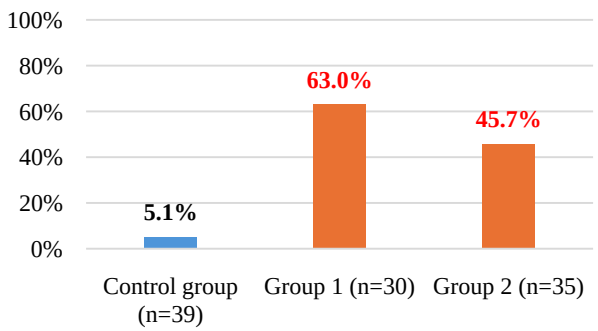

Figure 3. The number of diagnosed subclinical hypothyroidism in the examined women

CH was significantly more often detected in GDM: in 63.3% and 45.7% of women ($p<0.001$; table 2). Statistical data were

comparable between the studied groups with GDM (p=0.241).

Table 2. The structure of thyroid diseases

Groups	CH (abs. value, %)
Control group (n=39)	2 (5,1)
Group 1 (n=30)	19* (63,3)
Group 2 (n=35)	16* (45,7)

Note: the differences with the control group are statistically significant

The TSH level in the groups with GDH was comparable (p=0.201; table 3). The number of patients with SCI who had AT-TPO was also comparable (p=0.883).

Table 3. The level of thyroid-stimulating hormone in patients with GDM

Groups	TSH, ME/л			AT-TPO (abs.value, %)
	Me, Q_1–Q_3	Min	Max	
Group 1 (n=30)	4,40 (3,15–5,90)	2,6	6,7	9 (30,0)
Group 2 (n=35)	3,55 (3,32–4,22)	2,8	6,3	10 (25,6)

Note: TSH is a thyroid–stimulating hormone, and AT-TPO is an antibody to thyroperoxidase

The average concentration of AT-TPO also did not significantly differ between groups 2 and 3 (p=0.183).

Table 4. The number of patients with subclinical hypothyroidism who have been found to have antibodies to thyroperoxidase; the average concentration of antibodies to thyroperoxidase

Groups	AT-TPO (abs. value, %)	AT-TPO, ME/л		
		M±SD; 95%	Min	Max
Group 1 (n=30)	9 (30,0)	67,1±2,09 (65,5–68,7)	64,0	70,0
Group 2 (n=35)	10 (25,6)	63,0±6,60 (58,3–67,7)	51,0	72,0

It was also found that the risk of GSD in women with elevated TSH and anti-TPO levels was 3.2 times higher than in euthyroid women without signs of an autoimmune process in the thyroid gland.

4. Conclusions

Perhaps one of the mechanisms of GDM development in HRT is a decrease in the activity of lipid and glucose metabolism enzymes due to a decrease in thyroid activity, followed by an increase in free fatty acid levels and an increase in blood pressure. Compensatory enhancement of deiodinase activity leads to an increase in endogenous glucose production, thereby closing the vicious circle. Startseva N. M. et al. suggested that GH and GDH are interrelated pathologies, and the TSH level of 2.7 IU/l is a predictor of GDH.

REFERENCES

[1] Hong H., Zheng Y., Song S., Zhang Y., Zhang C., Liu J., Luo Y. Identification and characterization of DPP-IV inhibitory peptides from silver carp swim bladder hydrolysates, Food Biosci. 38 (2020), https://doi.org/10.1016/j.fbio.2020.100748.

[2] Knox C.A., Delaney J.A.C., Winterstein A.G. Anti-diabetic drug utilization of pregnant diabetic women in us managed care, BMC Pregnancy Childbirth (2014), https://doi.org/10.1186/1471-2393-14-28.

[3] Kim H.Y., Kim J., Noh E., Ahn K.H., Cho G.J., Hong S., Oh M., Kim H. Prepregnancy hemoglobin levels and gestational diabetes mellitus in pregnancy, Diabetes Res. Clin. Pract. 171 (2021) 1–7, https://doi.org/10.1016/j. diabres.2020.108608.

[4] Venkatesh K.K., Landon M.B. Diagnosis and management of gestational, Diabetes, Contemp. OB/GYN (2021).

[5] Shen Z., Yang C., Zhu P., Tian C., Liang A. Protective effects of syringin against oxidative stress and inflammation in diabetic pregnant rats via TLR4/MyD88/NF- κB signaling pathway, Biomed. Pharmacother. 131 (2020) 1–8, https://doi.org/10.1016/j.biopha.2020.110681.

[6] Li H., Shen L., Song L., Liu B., Zheng X., Xu S., Wang Y. Early age at menarche and gestational diabetes mellitus risk: results from the healthy baby Cohort study, Diabetes Metab. (2017), https://doi.org/10.1016/j.diabet.2017.01.002.

[7] Unnikrishnan R., Anjana R.M., Mohan V. Diabetes mellitus and its complications in India, Nat. Rev. Endocrinol. (2016), https://doi.org/10.1038/nrendo.2016.53.

[8] Sole K.B., Staff A.C., Laine K. Maternal diseases and risk of hypertensive disorders of pregnancy across gestational age groups, Pregnancy Hypertens. 25 (2021) 25–33, https://doi.org/10.1016/j.preghy.2021.05.004.