

# STUDYING THE CORRELATION BETWEEN FIRST TRIMESTER SERUM FERRITIN CONCENTRATION AND DIAGNOSIS OF GESTATIONAL DIABETES

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## INTRODUCTION

Gestational diabetes mellitus (GDM) according to the American diabetes association 2021, is diabetes that is first diagnosed in the second or third trimester of pregnancy that is not clearly either preexisting type 1 or type 2 diabetes. GDM is linked to an increased risk of macrosomia, neonatal hypoglycemia, preterm birth, or neonatal hyperbilirubinemia, as well as the mother having a higher risk of preeclampsia, dystocia and long- term complications such as type 2 diabetes mellitus.

Based on the "Hyperglycemia and Adverse Pregnancy Outcome (HAPO) study" and the current WHO recommendations, GDM diagnosis is accomplished with: One-step (75 gm OGTT): the diagnosis of GDM is made when any of the following plasma glucose values are met or exceeded: Fasting: 92 mg/dl, 1 h: 180 mg/dl, 2 h: 153 mg/dl. A single elevated value is sufficient for the diagnosis and already requires a strict metabolic control.

High iron stores in the liver may induce insulin resistance by impairing insulin signaling and by attenuating the liver's ability to extract insulin. In adipocytes, excess iron can diminish insulin-induced glucose transport, whereas in the muscles it may lead to a switch from glucose to fatty acid oxidation.

## AIM OF THE WORK

The aim of this study was to investigate the correlation between serum ferritin concentrations in the first trimester pregnancy and the diagnosis of gestational diabetes mellitus in high risk pregnant women, so as to provide new ideas for early detection and prevention of gestational diabetes.

## SUBJECTS AND METHODS

This study had been performed on high risk pregnant women (sample size: 50). Inclusion criteria:

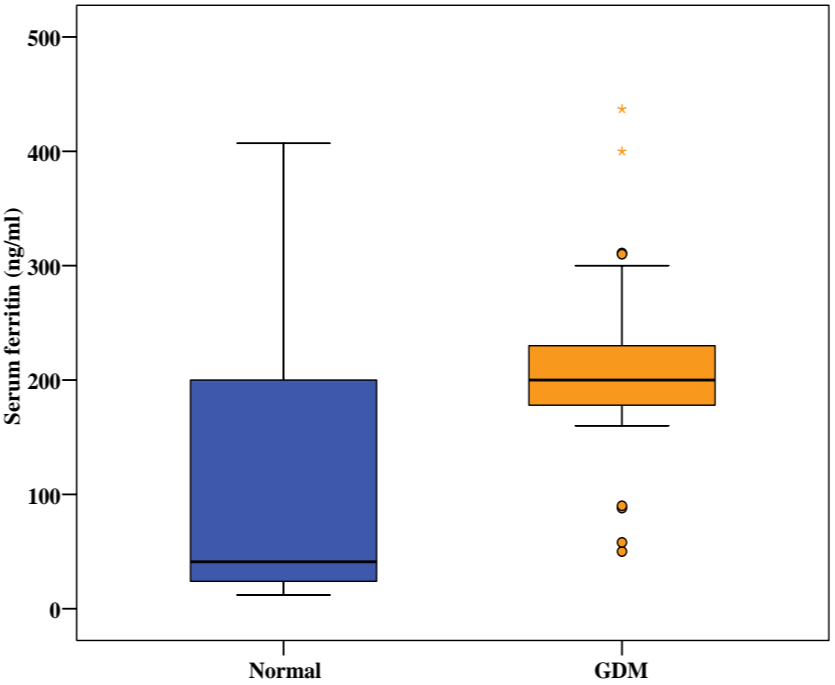
GDM in previous pregnancy, prediabetes, macrosomia, still birth, habitual abortions, age over 35 years old, diabetes symptoms, congenital fetal malformations. The serum ferritin concentration and the fasting blood glucose was measured at 10-12 gestational weeks, and 75g oral glucose tolerance test was performed at 24-28 weeks. According to the results of oral glucose tolerance test, the pregnant women was divided into GDM group and normal control group. (prospective control study).

## Results

**Table I:** Comparison between the two studied groups according to serum ferritin

Serum ferritin (ng/ml)	Total (n = 50)	Group I (n = 17)	Group II (n = 33)	U	p
Min. – Max.	12.0 – 437.0	12.0 – 407.0	50.0 – 437.0	131.50*	0.002*
Mean $\pm$ SD.	173.98 $\pm$ 110.53	106.0 $\pm$ 127.89	209.0 $\pm$ 82.53		
Median (IQR)	190.0 (58.0 – 230.0)	41.0 (24.0 – 200.0)	200.0 (178.0 – 230.0)		

U: Mann Whitney test  
IQR: Inter quartile range  
SD: Standard deviation  
p: p value for comparing between the two studied groups  
\*: Statistically significant at  $p \leq 0.05$   
**Group I:** Normal non diabetic pregnant women  
**Group II:** Gestational diabetic women

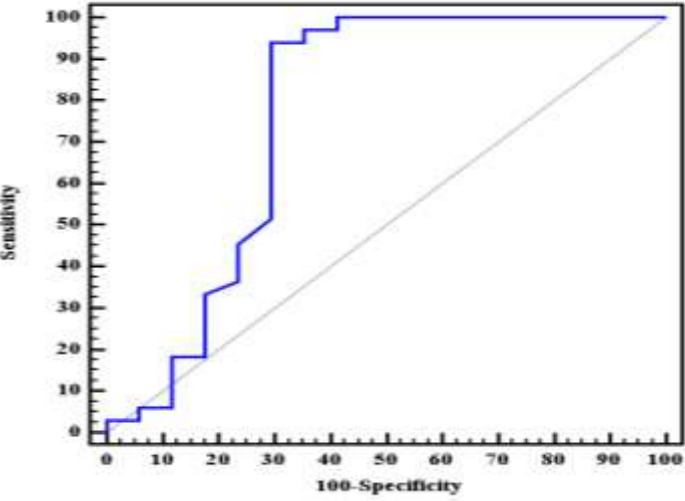


**Figure 1:** Comparison between the two studied groups according to serum ferritin

**Table 2:** Validity (AUC, sensitivity, specificity) for serum ferritin to discriminate gestational diabetic women patients (n = 33) from normal nondiabetic pregnant women (n = 17)

	AUC	p	95% C.I	Cut off	Sensitivity	Specificity	PPV	NPV
Serum ferritin (ng/ml)	0.766*	0.002*	0.589 – 0.942	>60	93.94	70.59	86.1	85.7

#Cut off was choose according to Youden index (>60)



**Figure 2:** ROC curve for serum ferritin to discriminate gestational diabetic women patients (n = 33) from normal non diabetic pregnant women (n = 17)

## CONCLUSION

In this study, we concluded that GDM was likely to be associated with high serum ferritin levels compared to non GDM mothers and by evaluation of serum ferritin levels it was possible to predict the outcome of the mother and the newborn.