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Original Research Article

A COMPARATIVE STUDY OF THE ASSOCIATION OF SERUM FERRITIN LEVEL WITH GESTATIONAL DIABETES MELLITUS IN THE DEPARTMENT OF OBSTETRICS AND GYNAECOLOGY AT SMS MEDICAL COLLEGE & ATTACHED GROUP OF HOSPITALS, JAIPUR

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Abstract

Background: The present study aimed to study the association of Serum Ferritin level with gestational diabetes mellitus

Methods: All Pregnant Females in Gestational age of 16 to 32 weeks presenting to the Ante natal clinic of Department of Obstetrics and Gynaecology, SMS Medical College, Jaipur. Based on Oral Glucose tolerance test, study participants were divided into two groups, Pregnant female with Gestational Diabetes (GDM group) and Pregnant female without Gestational Diabetes (Controls)

Results: Mean ferritin level was significantly higher in GDM group (33.51 ng/ml)) as compared to control group (24.97 ng/ml). This difference in mean ferritin level among the two groups was found to be statistically significant ($p<0.001$). This indicates that higher ferritin level is significantly associated with risk of GDM.

Conclusion: Serum ferritin in this study had a significant correlation with development of GDM. High ferritin range was found in females with GDM. Routine use of monitoring of serum ferritin levels, during the antenatal visit in the mid trimester should be carried out, for early prediction of developing GDM.

Keywords: GDM, Serum ferrtin, Metabolic conditions.

Introduction

Gestational Diabetes is metabolic condition arising during pregnancy, mostly during the 2nd trimester and is responsible for a variety of maternal and fetal complications. According to World health organization (WHO) guidelines gestational Diabetes Mellitus is defined as carbohydrate intolerance of variable severity with onset or first recognition during pregnancy, Gestational Diabetes Mellitus is "any degree of glucose intolerance that either starts during pregnancy or is newly diagnosed in pregnancy" as per ACOG (American College of. Obstetrics and Gynecology) [1]

High frequency of GDM among Indian women needs early diagnosis of GDM. There is no specific biochemical test so far available that can predict the risk of developing GDM. The occurrence of gestational diabetes mellitus may go unrecognized throughout pregnancy unless complications arise and some of these may occur very late. Because gestational diabetes mellitus is associated with adverse effects on the pregnancy and a significant number of patients subsequently develop overt diabetes, it is important to screen for the condition. Ferritin level is also in consistence with body iron stores and, therefore, is the most appropriate laboratory indicator for the estimation of iron stores. Hence, serum ferritin measurement is recommended for the evaluation of body iron status.[2] To add to existing research findings, the present study aimed to study the association of Serum Ferritin level with gestational diabetes mellitus.

Material and Methods

Type of Study: Hospital based comparative study.

Study Design: Cross Sectional Study.

Place of Study: This study will be conducted at Department of Obstetrics and Gynaecology, SMS Medical College, Jaipur.

Duration: The study was conducted from March 2020 to July 2021 till desired sample size was achieved and compilation of two month for data collection and analysis for study.

Study Participants: All Pregnant Females in Gestational age of 16 to 32 weeks presenting to the Ante natal clinic of Department of Obstetrics and Gynaecology, SMS Medical College, Jaipur.

Based on Oral Glucose tolerance test, study participants will be divided into two groups, Pregnant female with Gestational Diabetes (GDM group) and Pregnant female without Gestational Diabetes (Controls)

Inclusion Criteria

• Pregnant women in gestational age 16 to 32 weeks with viable pregnancy.
• Pregnant Women willing to participate in this study. Based on Oral Glucose tolerance test, study participants will be divided into two groups, Pregnant female with Gestational Diabetes (GDM group) and Pregnant female without Gestational Diabetes (Controls)

Exclusion Criteria

Pregnant women with-

• Iron deficiency anaemia.
• Previous History of Diabetes Mellitus (Type 1 and type 2 diabetes).
• H/o medical disorders of pregnancy.
• Hematological disorders (sickle cell anaemia, hemoglobinopathy, thalassemia etc.).
• Any local and systemic infection.

Results

Most of the study subjects in GDM group (46.7%) as well as Control group (48%) were aged 26 – 30 years, followed by 20-25 years. There were only 4% females in GDM group and 6.7% females in Control group aged 36-40 years. No significant difference in was seen in age distribution of patients in GDM and Control group (p=1.000).

Table 1: Comparison of mean ferritin (ng/ml) among study groups

Ferritin (ng/ml)	Cases	Control	p-value
Mean	33.51	24.97	0.001
SD	14.15	8.71	

t = 4.449 with 148 degrees of freedom

Present table shows that the mean ferritin level was significantly higher in GDM group (33.51 ng/ml)) as compared to control group (24.97 ng/ml). This difference in mean ferritin level among the two groups was found to be statistically significant ($p<0.001$). This indicates that higher ferritin level is significantly associated with risk of GDM.

Discussion

Gestational Diabetes Mellitus includes women, whose glucose tolerance, is normal after pregnancy and those with type 2 diabetes with persistent glucose intolerance developed later. The GDM incidence is nowadays increasing due to life style changes, increased obesity and metabolic syndrome prevalence. The trend towards modern life style, older age at child birth, changing eating habits and reduced physical activity has now lead to increased GDM incidence.

The mean ferritin level was significantly higher in GDM group (33.51 ng/ml)) as compared to control group (24.97 ng/ml). This difference in mean ferritin level among the two groups was found to be statistically significant. Rui Jiang et al (2004)[3] similarly observed that among cases, the mean (SD) concentration of ferritin was significantly higher than for controls (109 [105] vs 71.5 [68.7] ng/mL).

Xinhua Chen et al (2006)[4] found that Women who developed GDM had a higher concentration of serum ferritin than women who did not develop GDM.

Faranak Sharifi et al (2010) [5] also observed that Women with GDM had a significantly higher concentration of serum ferritin (112 ± 28.4 pmol/L in GDM versus 65 ± 16.9 pmol/L in controls.) Fatemeh Nasiri Amiri et al (2013)[6] also observed similar findings. Shristi Rawal et al (2016)[7] observed that ferritin levels were positively associated with GDM risk. Katherine A Bowers et al (2016)[8] also found that ferritin was positively and significantly associated with GDM risk. Sedigheh Soheilykhah et all (2017)[9] found that Women who developed GDM had a higher concentration of serum ferritin than women who did not develop GDM.

Conclusion

Serum ferritin in this study had a significant correlation with development of GDM. High ferritin range was found in females with GDM. Routine use of monitoring of serum ferritin levels, during the antenatal visit in the mid trimester should be carried out, for early prediction of developing GDM. Serum ferritin levels, apart from iron store indicator, are a good predictor of risk of GDM. This association is mediated by fat mass of the mother and obesity, at least in part as indicated by higher BMI among females with GDM. This data in this study suggests a possible link, between high serum ferritin and low grade inflammation and insulin resistance in pregnancy, which creates the risk of developing GDM.

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