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ASSESSMENT OF SERUM FERRITIN LEVEL IN DIABETIC AND NON-DIABETIC PREGNANT WOMEN

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Abstract

Ferritin is a protein that stores and releases iron in the cells. When the body doesn't have enough iron then ferritin gives up its iron. Whenever the body has too much iron ferritin stores it away. In diabetic and non-diabetic pregnant women changes in serum ferritin level observed during first, second and third trimester. The aim of this study is to assess serum ferritin level in first second and third trimester in diabetic and non-diabetic pregnant women. A cross sectional study was carried out in MLT lab at City University of science and information technology. All diabetic and non-diabetic pregnant women were included in the study and all non-

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pregnant women were excluded from our study. The study shows a significant raised serum ferritin level in diabetic pregnant women in first trimester (P<.000). Same like in second and third trimester the serum ferritin in diabetic pregnant women is significantly higher (P<.000) (second trimester) and in third trimester (P<.002). In the second and third trimester as the pregnancy becomes advanced, the serum ferritin level falls and becomes lowest in the third trimester. In conclusion serum ferritin is a good and reliable marker for detection of iron during pregnancy as compared to hemoglobin; especially for latent stage iron assessment and ferritin may be included in routine clinical practices and antenatal care programs for improving health status of Pakistani women.

INTRODUCTION

Ferritin is a protein. It helps to store and manage iron levels (Sudarev *et al.*, 2023). The body absorbs iron from food in the small intestine, and recycles it from old RBCs and store in the liver (Moscheo *et al.*, 2022). Iron is crucial for growth and development, especially in fetuses, infants, and children. Recent studies shown, women with diabetes had S. ferritin levels were noticeably greater than those of women without diabetes, across all racial and ethnic groups (Liu et al., 2020). The excessive iron stored in the form of ferritin which interact with genetic and environmental factors, disrupting β-cell function and insulin production. This leads to oxidative stress, which further exacerbates insulin resistance and hyperglycemia (Gautam *et al.*, 2021). It occurs when the balance between cellular antioxidants and pro-oxidants is disrupted (Ornoy *et al.*, 2021). Study shown, that the risk of gestational diabetes mellitus can be elevated in pregnant women who have sufficient iron stores if they take an iron supplement (Gautam *et al.*, 2021).

Aims and objectives

Assessment of serum ferritin level in diabetic and non-diabetic pregnant women is the aim of our study.

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- To determine serum ferritin level in first, second and third trimester in diabetic and non-diabetic pregnant women.
- To evaluate association between diabetes and serum ferritin level in diabetic and non-diabetic pregnant.

Methodology

A cross sectional study was carried out in MLT lab at City University of Science and Information Technology, Peshawar. The investigation was carried out January 2024 to July 2024. The sample size of our study was 300 in which 150 were Diabetic pregnant women and 150 were non-Diabetic pregnant women's and also, they were divided 50 women's according to the trimesters. The sample collection was done from Government general hospital Nishtarabad Peshawar, The tool that was used for Statistical analysis was SPSS 2024 version. All diabetic and non-diabetic pregnant women were included in the study and all non- pregnant women were excluded from our study.

Results

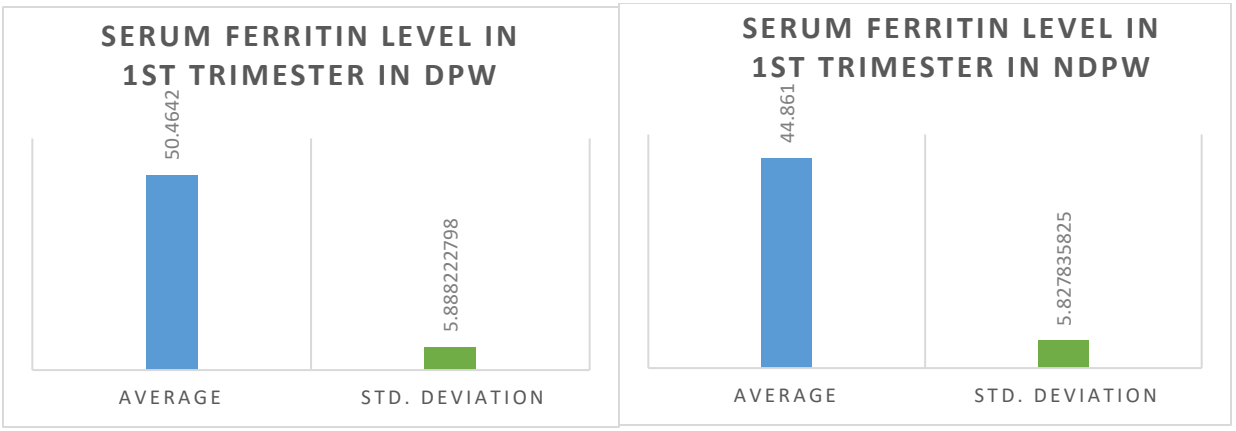

Figure 1: *Shows the average and Std. Deviation of S. Ferritin test in 1st trimester of NDPW and DPW*

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Result of this study shows changes in serum ferritin level in non-diabetic and diabetic pregnant women in first trimester. The data was analyzed by using the paired sample T-test. The significant changes in serum ferritin level were significantly correlated, as shown in table 1.

Table 1: Mean, Std. Deviation and P-Value of serum ferritin level in non-diabetic and diabetic pregnant women in first trimester.

Test	Category	N	Mean	Std. Deviation	P-value
Serum Ferritin	NDPW	50	44.8610	5.82784	.000
	DPW	50	50.4642	5.88822	

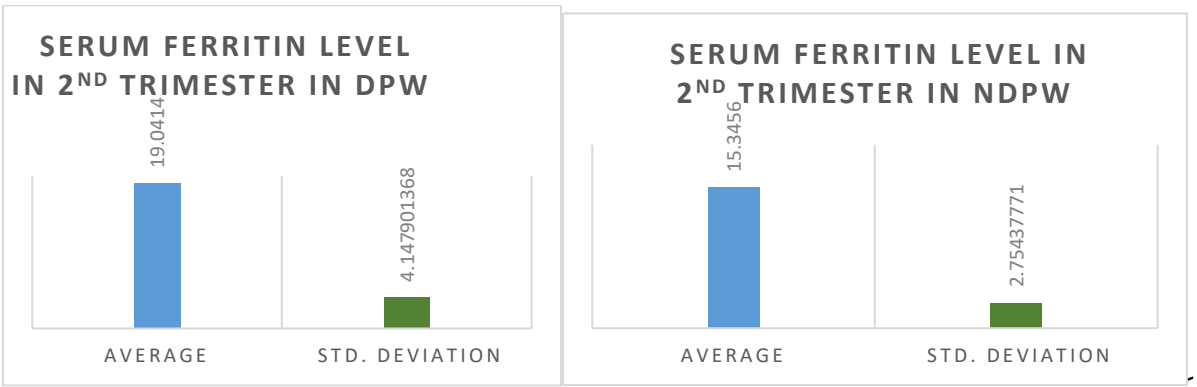

Figure 2: Shows the average and Std. Deviation of S. Ferritin test in 2nd trimester of NDPW and DPW.

Result of this study shows changes in serum ferritin level in non-diabetic and diabetic pregnant women in second trimester. The data was processed by using the paired sample T-test. The changes in serum ferritin level were significantly correlated, as shown in table 2.

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Table 2: shows Mean, Std. Deviation and P-Value of serum ferritin level in non-diabetic and diabetic pregnant women in first trimester.

Test	Category	N	Mean	Std. Deviation	P-value
Serum Ferritin	NDPW	50	15.3456	2.75438	.000
	DPW	50	19.0414	4.14790	

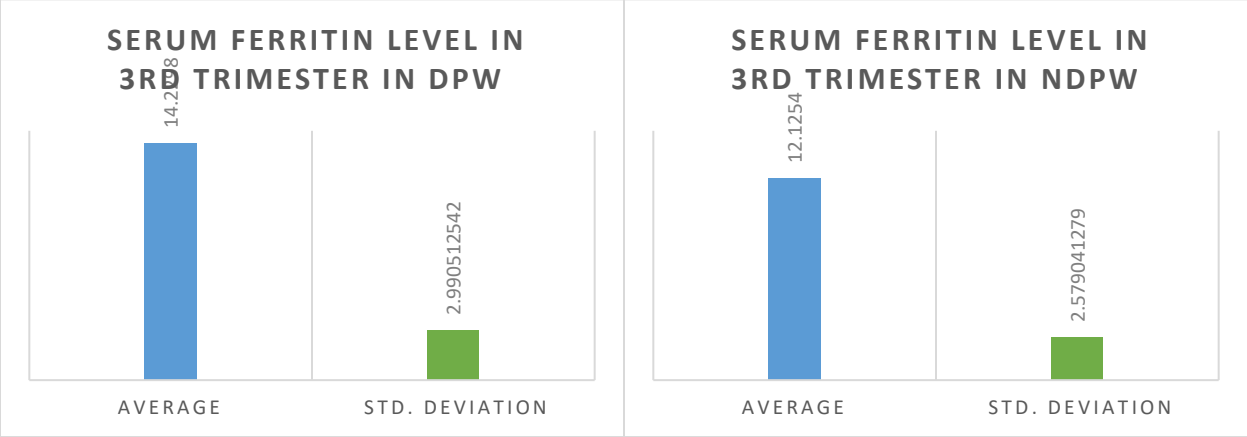

Figure 3: S. Ferritin test of NDPW, DPW and Std. Deviation of serum ferritin level in NDPW in 3rd trimester.

Results of this study shows changes in serum ferritin level in non-diabetic and diabetic pregnant women in third trimester. The data was analyzed by using the paired sample T-test. The significant changes in serum ferritin level were significantly correlated, as shown in table 3.

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Table 3: Mean, Std. Deviation and P-Value of serum ferritin level in non-diabetic and diabetic pregnant women in first trimester.

Test	Category	N	Mean	Std. Deviation	P-value
Serum Ferritin	NDPW	50	12.1254	2.57904	.002
	DPW	50	14.2298	2.99051	

Discussion

Ferritin is an important iron storage protein produced by the liver, bone marrow, and placenta. In this study, serum ferritin levels were found to be significantly higher in diabetic pregnant women compared to non-diabetic pregnant women during all trimesters. The increase was most noticeable in the first trimester ($P < 0.000$) and remained higher in the second ($P < 0.000$) and third trimesters ($P < 0.002$). This suggests that diabetes during pregnancy affects iron metabolism, possibly due to inflammation or high blood sugar levels.

Previous studies support these findings. Pandey et al. (2023) also reported a strong link between high blood glucose and increased ferritin levels. Other studies (Bissa, eta al. 2024) found that ferritin levels normally decrease as pregnancy progresses, reflecting the growing iron needs of the mother and baby. However, in diabetic pregnancies, ferritin levels stay higher than normal, showing that diabetes changes how the body handles iron.

Conclusion

In the conclusion, this study found the serum ferritin level in all three trimesters of diabetic and non-diabetic pregnant women. The findings of this research show significant difference in serum ferritin level across three trimesters in pregnancy.

By the analysis of serum ferritin level Serum ferritin is a good and reliable marker for detecting iron during pregnancy in the first, second, and third trimesters when compared to hemoglobin, especially

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for latent stage iron assessment. Routine prenatal care programs may incorporate ferritin to improve the health status of Pakistani women. During all three trimesters there were significant variations observed. The serum ferritin level decreases with the development of pregnancy and the lowest value of serum ferritin level observed in the third trimester. Pregnant women with diabetes had significantly higher blood ferritin levels than non-diabetic pregnant women during all trimester.

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