



Original Article

Estimate the FN and BMI levels in pregnant women with pre-eclampsia

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Abstract:

Preeclampsia, previously known as toxemia, impacts an estimated 4 million people globally and causes the deaths of over 70,000 mothers and 500,000 infants annually. Among all pregnancies, approximately 0.5% are affected by preterm pre-eclampsia, which accounts for 10% of pre-eclampsia cases. Preterm pre-eclampsia is more severe than pregnancies carried to term and linked to increased rates of mother and infant morbidity and death. In this investigation, 100 participants in total were divided into two groups: 50 pregnant women with pre-eclampsia and 50 pregnant women without pre-eclampsia in the control group. The severity of the condition was evaluated by analyzing biomarker FN with BMI of pregnant women. Microsoft Excel 2019 and SPSS software were used to assess the data gathered from August 2024 to December 2025. serum FN level and BMI were increase in patient group compared to the control. Serum FN level is a useful marker to predict and diagnose pre-eclampsia.

Keyword: FN, BMI, pregnant women pre-eclampsia.

Introduction:

Pre-eclampsia represents a serious challenge of pregnancy since it is regarded as the primary reason behind the death of mother and infant infants. Preeclampsia, previously known as toxemia, impacts an estimated 4 million people globally and causes the deaths of over 70,000 mothers and 500,000 infants annually (Poon, L. et al. 2019, Magee, L. A. et al. 2022). Among all pregnancies, approximately 0.5% are affected by preterm pre-eclampsia, which accounts for 10% of pre-eclampsia cases (Chappell LC et al.,2021). Preterm pre-eclampsia is more severe than pregnancies carried to term and linked to increased rates of mother and infant morbidity and death (Phipps et al.,2019). Life expectancy is lower for those who suffer from pre-eclampsia since they are exposed to various other diseases

such as cardiovascular disease, diabetes, stroke, and other complications (Dimitriadis et al.,2023). Babies whose mothers have preeclampsia are more likely to be born prematurely, have perinatal mortality, experience delays in neurodevelopment, and suffer cardiovascular and metabolic diseases later in life (WHO recommendation 2018, Phipps EA et al.,2019). Previous study that focusing on pre-eclampsia as a fundamental cause of mothers and newborns death. Pregnancy-related hypertension issues account for 15% of maternal fatalities in Egypt. About 10% of pregnant women have hypertension, which seriously compromises public health according to WHO recommendations 2018. Along with other issues such proteinuria, uteroplacental dysfunction, or angiogenic imbalance, Pre-eclampsia involves

multiple systems. condition marked by abruptly elevated blood pressure more than 20 weeks of pregnancy (Magee, 2022). women with severe pre-eclampsia may benefit from more aggressive therapy to avoid problems. Intervention studies are very necessary in order to determine the most appropriate treatment plan for women who have non-protein uric pre-eclampsia or positive biomarkers that do not seem to have any clinical relevance (Mol et al. 2016) . Over 10% of pregnancies and about 240,000 women in the US are affected by hypertension each year, making it a common medical issue during pregnancy. Although preeclampsia has been recognized to doctors for thousands of years. High blood pressure could negatively impact both the mother and the fetus. The severity of the potential adverse effects ranges from minor to potentially fatal. In the advanced countries, the second-leading direct cause of death for mothers is hypertensive disorders of pregnancy (Braunthal & Brateanu, 2019) .

Materials and Methods:

A case-control study was conducted on 100 pregnant women, 50 of whom were categorized as having pre-eclampsia and 50 of whom were not. We collected Samples from Karbala Teaching Obstetrics and Gynecology Hospital from August

2024 to December 2025. The study included pregnant women who had pre-eclampsia and those who did not, who were used as controls group. Exclusion criteria women with hypothyroidism or hyperthyroidism and women with any chronic disease such as diabetes mellitus. Demographic data was documented such as FN and BMI. Each patient and control had their BMI measuring and blood samples taken. Five ml of venous blood were collected aseptically using a plastic syringe and the usual venepuncture safety precautions. The five milliliters were then transferred into a gel tube to measure Fibronectin marker. FN marker was measure automatically by ELISA technique. All Microsoft Excel and SPSS software (V.28 Inc., Chicago, USA) were used to analyze the data.

Results:

The current study was conducted on 100 people suffering from pre-eclampsia and healthy. We take 50 samples suffering from pre-eclampsia patient and 50 sample without pre-eclampsia as a control. The result appears that there is significant increase in FN in per-eclamptic women compared with non-pre-eclamptic women (58.761 ± 16.836 and 74.689 ± 16.757), as shown in table 1 and figure 1.

Table 1: Comparison of FN of all patients compared with control group

Parameters	Control		Patient		P. value
	Mean	Std. Deviation	Mean	Std. Deviation	
FN	58.761	16.836	74.689	16.757	0.0005

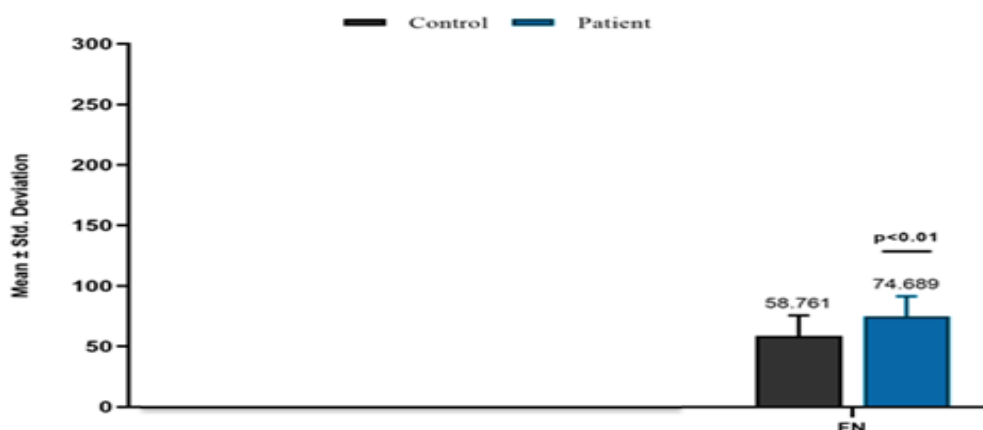


Figure1: Comparison of the FN parameter of all patients compared with control group

The findings of this investigation demonstrated that there is substantial increase in FN in per-eclamptic women compared with non-pre-

eclamptic women (58.761 ± 16.836 and 74.689 ± 16.757), as displayed in Table 2 and figure 2.

Table 2: Comparison of BMI of all patients compared with control group

Parameters	Control		Patient		P. value
	Mean	Std. Deviation	Mean	Std. Deviation	
BMI	27.458	4.127	33.392	5.713	0.0005

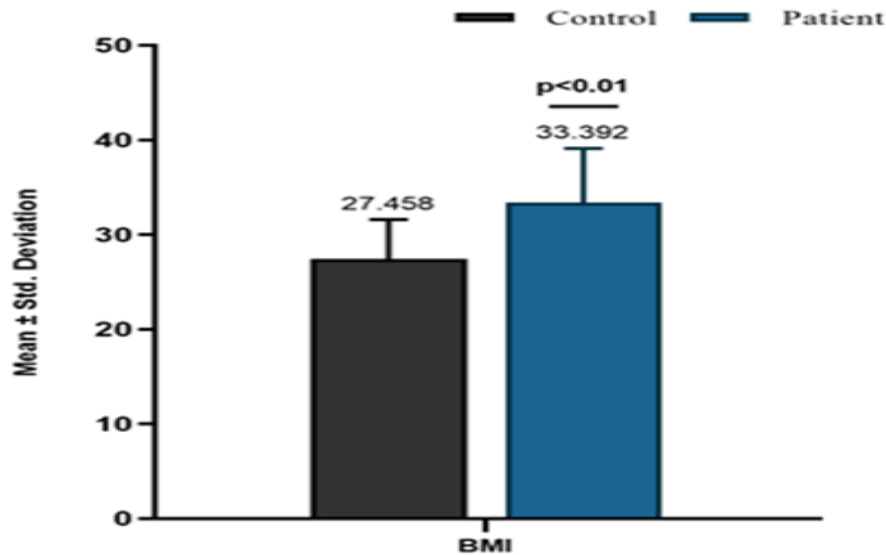


Figure 2: Comparison of BMI of all patients compared with control group.

Discussion:

Advanced maternal age, elevated body mass index, primigravida, multifetal pregnancy, Diabetes mellitus and persistent hypertension are two risk factors for preeclampsia. Twin pregnancies can occasionally increase the risk of preeclampsia. The incidence is 6-31%. Preeclampsia symptoms can appear later in 41.9% of partial hydatidiform molar pregnancies if treatment is not received, and hydatidiform molar pregnancies are at risk for developing very early onset preeclampsia (Oparil S et al , 2003). Blood VCAM-1 and fibronectin Compared to a normal pregnancy; levels were greater in pre-eclampsia/eclampsia. Diastolic blood pressure was significantly correlated with both fibronectin and VCAM-1 levels ($r = 0.49$ and $r = 0.65$, $P < 0.001$). Additionally, there was a substantial direct linear association ($r=0.57$, $P<0.001$) between the levels of VCAM-1 and plasma fibronectin. The prevalence of abnormal placental bed biopsy results rose with the degree of pre-eclampsia,

while all normotensive women had normal placental bed biopsy results (Townsend R et al ,2016). The control group and only cases with placental lesions were included in a secondary analysis to see if subclassifying early preeclampsia cases by placental lesions could result in distinct protein markers and improved prediction performance(Tarca et al., 2019). When only severe early preeclampsia cases were included in the analysis and compared to normal pregnancy cases, the sensitivity of analysis was significantly higher than for overall early preeclampsia. Other differences in the set of best predictors for severe early In the 8–16 week gestational age range, preeclampsia was observed in comparison to overall early preeclampsia(Fondjo et al., 2019) .

Although preeclampsia (PE) education has been shown to improve health outcomes, it is unclear how often Utah healthcare practitioners use physical education in prenatal instruction and how much of the information women remember.

Consequently, the purpose of this research was to find out how often physical education is taught in prenatal education and to investigate mothers' awareness of the subject in Utah. Additionally, factors related to PE knowledge were examined (Wilkinson J, 2018). There is a correlation between PE and changes in angiogenic and antiangiogenic factors, with PIGF being the most prominent of these. For the purpose of predicting the progress of PE in women who have clinical suspicion of the illness, the PREDICTION of Short-Term Outcomes in Pregnant Women with Suspected PE Study (PROGNOSIS) set a sFlt-1/PIGF ratio threshold of 38. Additionally, the sFlt-1/PIGF ratio test can help identify high-risk patients needing adequate care, potentially reducing unnecessary hospitalizations for women with PE due to lack of near-term risk (Mol et al. 2016).

Pre-eclampsia patients are at a significantly higher likelihood of subsequently developing cardiovascular diseases years. This risk includes an almost fourfold increase in hypertension, an almost twofold increase in stroke, venous thromboembolism, and both fatal and nonfatal ischemic heart disease. This relationship can be explained by two mechanisms: lipid buildup in the uterine spiral arteries, which resembles the early stages of atherosclerosis, and common risk factors shared by both illnesses. Obese or overweight people have an approximate 2-3 times higher overall risk of pre-eclampsia. Pre-eclampsia risk gradually increases even when BMI is within normal limits. Early or pre-eclampsia cases increase the risk of severe characteristics, leading to increased fetal morbidity and mortality (Wilkinson J, 2018).

Conclusion:

In summary, our research showed that maternal serum PP13, GPT, and level were significantly lower in pregnant PE women, while GOT levels were somewhat higher in PE women. Maternal serum pp13 is anticipated to develop into a possible biomarker for PE diagnosis, offering a fresh approach to PE early detection and prediction. However, in order to update our

existing conclusions—which are crucial for assessing screening effectiveness and determining the best diagnostic thresholds for clinical practice—more extensive, longitudinal, and verified investigations are required.

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