



EVALUATION OF ASSOCIATION OF PREGESTATIONAL BMI WITH PREECLAMPSIA

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ABSTRACT **INTRODUCTION:** Preeclampsia is diagnosed by the presence of de novo hypertension after 20 weeks' gestation accompanied by proteinuria and/or evidence of maternal acute kidney injury (AKI), liver dysfunction, neurological features, hemolysis or thrombocytopenia, or fetal growth restriction. Proteinuria is not mandatory for a diagnosis of preeclampsia.¹ It complicates 2–8% of all pregnancies². Dietary factors such as deficit intake of calcium, protein, vitamins, folic acid and essential fatty acids along with excess of maternal weight gain during pregnancy or increased maternal prepregnancy BMI have been associated with pathogenesis of preeclampsia.

Present study was conducted on 130 antenatal women attending antenatal clinics in Swaroop Rani Nehru Memorial Hospital over a period of 1 year from July 2019 to August 2020 to study association between pregestational BMI and preeclampsia.

AIMS AND OBJECTIVE: 1.) To find out prevalence of preeclampsia in antenatal women attending antenatal clinics of Swaroop rani Nehru hospital.

2.) To find association between pregestational BMI and onset of preeclampsia in antenatal women

METHOD AND MATERIAL: Present study was conducted on 130 antenatal women attending antenatal OPD and admitted to labour room of Swaroop rani Nehru hospital. Thorough general and obstetric examination was done. Routine blood investigations including complete hemogram, thyroid profile, HIV, HBsAg, VDRL, Blood sugar (PPBS after 75 gram glucose), Urine routine and microscopy was sent. Liver, renal function test, 24 hour urinary protein ophthalmoscopy fundus examination was done additionally in antenatal women diagnosed with hypertension to make diagnosis of preeclampsia.

OBSERVATION AND RESULTS: Total 130 antenatal women were enrolled in this study. Out of 130, total 105 (81.0%) were normotensive (control group) and 25 (19.0%) were hypertensive status (case group).

The distribution of cases according to BMI were significantly different ($p < 0.001$) in between group 1 (24.50 ± 2.37) and group 2 (25.34 ± 2.91) patients group. Whereas, the mean BMI was comparable both control group (24.99 ± 3.45) and study group (25.28 ± 3.52).

The present study shows positive association between increased BMI and Preeclampsia in pregnant women ($p\text{-value} < 0.05$)

CONCLUSION: Obesity is associated with the pathogenesis of both preeclampsia and cardiovascular diseases in pregnancy but it is a potentially modifiable risk factor. Hence it is necessary for an obstetrician to be aware of these modifiable risk factors such as increased BMI and faulty dietary habits in patients, the pathologies and associated comorbidities associated with them so that they can modify patient care before pregnancy, during pregnancy and in the postpartum period to reduce the risk of these adverse outcomes

KEYWORDS :

INTRODUCTION

Preeclampsia is diagnosed by the presence of de novo hypertension after 20 weeks' gestation accompanied by proteinuria and/or evidence of maternal acute kidney injury (AKI), liver dysfunction, neurological features, hemolysis or thrombocytopenia, or fetal growth restriction. Proteinuria is not mandatory for a diagnosis of preeclampsia.¹ (It complicates 2–8% of all pregnancies² According to national health portal of India, prevalence of preeclampsia in our country is 8–10%. The World Health Organization (WHO) estimates the incidence of preeclampsia to be seven times higher in developing countries (2.8% of live births) than in developed countries (0.4%). Its increasing trends can be attributed to factors like pre pregnancy hypertension, obesity and metabolic syndrome due to sedentary lifestyles, faulty dietary habits and increased maternal age at first childbirth.

Obesity increases the overall risk of preeclampsia by approximately two- to threefold.⁽³⁾ The risk of preeclampsia increases progressively with increasing BMI, even within the normal range. It has been proposed that obesity contributes to hypertension by multiple mechanisms including reduction in available nitric oxide due to oxidative stress, increase in sympathetic tone, and increased angiotensinogen by adipose tissue.⁽⁴⁾

It is a well known fact that weight loss reduces the risk of preeclampsia.⁵ Also obese women have reduced fetoplacental vascularity characterized by low numbers of capillaries in villi.⁽⁶⁾ In a study conducted by Higgins et al, it was found that obesity is associated with placental hypertrophy along with reduced cell turnover which leads to fetal hypoxic insult.^{7,8} These findings suggest that obesity-related metabolic factors inhibit cytotrophoblast-mediated spiral artery remodeling thereby contributing to the development of placental ischemia-induced hypertension.

Present study was conducted on 130 antenatal women in 3rd trimester of pregnancy, attending antenatal clinics in Swaroop Rani Nehru Memorial Hospital over a period of 1 year from July 2019 to August 2020 to study association between pregestational BMI and preeclampsia.

AIMS AND OBJECTIVES

- 1.) To find out incidence of preeclampsia in antenatal women attending antenatal clinics of Swaroop rani Nehru hospital.
- 2.) To find association between pregestational BMI and onset of preeclampsia in antenatal women

METHOD AND MATERIAL

Study: Analytical observational study

Sample size : 130

Duration : 1 year.

INCLUSION CRITERIA:

Antenatal women attending antenatal clinic in 3rd trimester of pregnancy, in Department of obstetrics and gynaecology, Swaroop rani Nehru medical college Prayagraj.

EXCLUSION CRITERIA

- 1.) Patients not giving consent for study.
- 2.) Antenatal women with period of gestation less than 20 weeks.
- 3.) Patients with chronic medical illnesses like diabetes, hypertension, tuberculosis, chronic liver diseases, chronic kidney disease etc.

Study Procedure:

Present study was conducted on 130 antenatal women attending

antenatal clinics and admitted to labour room of Swaroop rani Nehru hospital with period of gestation more than 20 weeks .Thorough general and obstetric examination was done. Routine blood investigations including complete hemogram,,thyroid profile, HIV, HBsAg,VDRL,Blood sugar(PPBS after 75 gram glucose) ,Urine routine and microscopy was sent.Liver,renal function test ,24 hour urinary protein ophthalmoscopy fundus examination was done additionally in antenatal women diagnosed with hypertension.

Antenatal women with blood pressure more than 140/90 mmHg with two readings taken 4-6 hours apart along with signs and symptoms of end organ damage were diagnosed with preeclampsia and included in case group.Normotensive antenatal women were taken as controls.

STATISTICAL ANALYSIS:

Chi square is used to assess comparison with P-value significance level as <0.05

OBSERVATION AND RESULTS

Table 1: Distribution of study group according to normotensive and hypertensive status

Group	Numbers	Percentage
Case group	25	19%
Control group	105	81%
Total	130	100%

Total 130 cases were enrolled in this study. Out of 130, total 105 (81.0%) were normotensive (control group) and 25 (19.0%) were hypertensive status (case group).

Table 2: Age based distribution of study population.

Age group	Control group		Case group		P value
	N	%	N	%	
21-25 years	50	47.62	8	32.0	0.109
26-30 years	45	42.86	11	44.0	
> 30 years	10	9.52	6	24.0	

Distributions of cases according to the age is shown in Table 2 and Fig. 2. In case of Control group (47.2%) majority of women were between age group 21-25 years. While in case of preeclampsia group maximum cases were in 26-30 (44%) years age group.However no significant difference was found between the two groups on the basis of mean age group.(P-value >0.01)

Table 3: Pre-gestational Body mass index based distribution.

BMI (Kg/m ²)	Control group		Case group		p-value
	n	%	N	%	
<18.5	4	3.8	0	0.0	<0.001*
18.5- 24.9	88	83%	1	4.0	
25- 29.9	10	9.5	23	92.0	
≥ 30	3	2.8	1	4.0	
Mean±SD	24.99±3.45		25.28±3.52		

*Significant (p<0.05)

The distribution of cases according to BMI were significantly different (p<0.001) in between group 1 (24.99±3.45) and group 2 (25.28±3.52) patients group. Whereas, the mean BMI was comparable both control group (24.99±3.45) and study group (25.28±3.52).

DISCUSSION

In the present study, out of 130 cases , 19% cases are pre eclamptic and 81% are normotensive (Table -1) In the study conducted by Nidhi D et al (2019)⁹ and Y Pramoda (2020)¹⁰ showed incidence of preeclampsia in antenatal women as 18% and 25% respectively which were similar to the present study (19%).

The present study shows positive association between increased BMI and Preeclampsia in pregnant women (p-value<0.05) which is similar to study conducted by K Kameswaramma(2017)¹¹ (<0.01).

In the Avon Longitudinal Study of Parents and Children conducted at the University of Bristol it was found that increased prepregnancy weight is associated with increased risk of preeclampsia in pregnancy.From metabolic point of view pregnancy in itself is a catabolic state which leads to insulin resistance and atherogenic lipid profile.

But it is not necessary that all overweight and obese women develop

preeclampsia during the course of pregnancy. Infact BMI is not an a perfect marker of obesity and it is the central (abdominal) obesity that accounts for increased risk of metabolic abnormalities like insulin resistance,hyperinsulinemia,low plasma HDL cholesterol.

Moreover ,adipose tissue acts as a hormonally active tissue producing cytokines,adipokines producing inflammation and oxidative stress.

Although weight loss is not recommended during pregnancy but studies have found that excessive maternal weight gain is associated with an increased risk of preeclampsia ¹², thus weight loss is recommended in women with obesity or overweight that are planning to be pregnant ¹³

Data suggest that if regular physical activity is performed during the year before pregnancy and during early pregnancy, there is reduction in risk associated with development of of preeclampsia during pregnancy.¹⁴

Hence weight loss prior to pregnancy should be encouraged in overweight and obese women to decrease the risk of adverse outcomes.

CONCLUSION

Dietary factors such as deficit intake of calcium, protein, vitamins,folic acid and essential fatty acids along with excess of maternal weigh gain during pregnancy or increased maternal prepregnancy BMI have been associated with pathogenesis of preeclampsia.

Obesity is associated with the pathogenesis of both preeclampsia and cardiovascular diseases in pregnancy but it is a potentially modifiable risk factor,Hence it is necessary for an obstetrician to be aware of these modifiable risk factors such as increased BMI and faulty dietary habits in patients , the pathologies and associated comorbidities associated with them so that they can modify patient care before pregnancy , during pregnancy and in the postpartum period to reduce the risk of these adverse outcomes

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