



## TO STUDY PREVALENCE OF PREECLAMPSIA AND ITS COMPLICATIONS ASSOCIATED FACTORS AMONG ANTENATAL WOMEN IN PONDICHERRY

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### ABSTRACT

It is a leading cause of fetal and maternal morbidity and mortality and represents a considerable healthcare resources burden in developed countries. Preeclampsia is a one of the most serious multi-organ complication in antenatal women distinct by the new onset of hypertension and proteinuria at gestational week 20 or after. It is a leading cause of fetal and maternal morbidity and mortality and represents a considerable healthcare resources burden in developed countries<sup>2</sup>. The aim of the study is prevalence of preeclampsia and its associated factors among antenatal women. This cross-sectional study conducted at Obstetrics and Gynaecology, Sri Lakshmi Narayana Institute of Medical sciences, Pondicherry. A total of 250 consecutive consenting pregnant women were recruited for the study. The prevalence of inadequate and adequate knowledge of PE was 86.5% and 12.4%, respectively. For participants with adequate knowledge of PE, 10.1% and 3.2% had moderate and high knowledge, respectively, based on Bloom's cut-off point. The awareness of preeclampsia along with pregnant women is very important, to prevent the cardiovascular sequelae in the offspring including hypertension and altered vascular function.

**Key words:** Preeclampsia, Pregnancy, Foetal diseases, Hypertension.

### INTRODUCTION

Preeclampsia is a heterogeneous syndrome driven by disturbed placental function in early pregnancy and an imbalance of angiogenic factors. Preeclampsia is a one of the most serious multi-organ complication in antenatal women distinct by the new onset of hypertension and proteinuria at gestational week 20 or after [1]. It is a leading cause of fetal and maternal morbidity and mortality and represents a considerable healthcare resources burden in developed countries [2]. The first stage take in the impairment of fetal trophoblastic invasion of the decidua and local placental hypoxia [3]. 2nd stage related to the release of placental blood-related factors into the maternal circulation and aberrant expression of pro-inflammatory, antiangiogenic and angiogenic factors. [4]

PE is frequently characterized by high blood pressure and proteinuria, with the clinical manifestation usually occurring during the 20th week of gestation or late in pregnancy and regressing post-delivery. It is two main types: early-onset PE occurring before 34 weeks of gestation and late-onset PE occurring after 34 weeks of gestation. [5] Although the presenting features of early- and late-onset PE may overlap, early arrival PE is linked with increased odds of complications, particularly preterm birth, fetal growth restriction and maternal morbidity and mortality compared to late onset PE. Women with PE also present with various signs and symptoms and symptoms related to multiple organ systems.

Headaches, visual disturbances, abnormal kidney feature, extreme hypertension, chest ache, pulmonary

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oedema and occasional oxygen saturation, nausea and peculiar liver feature are most of the common outcomes of the multi-organ device disorder in PE. Risk factors of PE include first being pregnant, age (being pregnant at a complicated age or under 18 years of age), circle of relatives records of PE, non-public history of PE, weight problems, gestational diabetes, multi fetal gestation and preexisting clinical conditions consisting of chronic hypertension [7].

Preeclampsia is a heterogeneous syndrome driven by disturbed placental function in early pregnancy and an imbalance of angiogenic factors, such as soluble fms-like tyrosine kinase-1 (sFlt-1; also known as sVEGFR-1), placental growth factor (PlGF) and soluble endoglin (sEng). In preeclampsia, excess placental secretion of sFlt-1 and sEng inhibits vascular endothelial growth factor (VEGF) and transforming growth factor  $\beta$ 1 signaling, respectively, resulting in endothelial cell dysfunction. sFlt-1 also antagonizes circulating pro-angiogenic PlGF, resulting in decreased PlGF expression in preeclamptic women [8].

Late-onset preeclampsia (after 34 weeks) is associated with less dramatic dysregulation of angiogenic factors than early-onset preeclampsia. The ratio between the anti-angiogenic factor sFlt-1 and pro-angiogenic PlGF has been shown to be elevated in women with diagnosed preeclampsia and markedly elevated before clinical onset [9]. Therefore adequate knowledge about a disorder contributes greatly to its prevention, control and management. Reports showed that patients' knowledge about a disease has significant benefits on compliance to treatment and helps to abate complications associated with the disease, the aim of the study to Prevalence of preeclampsia and its associated factors among antenatal women.

## METHODS

This cross-sectional study conducted at the (Antenatal Care Unit) Obstetrics and Gynaecology, Sri Lakshmi Narayana Institute of Medical sciences, Pondicherry. The sample size for this study was calculated using the MedCalc Statistical Software version 18.9. A total of 250 consecutive consenting pregnant women were recruited for the study. All pregnant women who consented after the aim and objectives had been explained to them were eligible to participate in the study. Excluded participants were pregnant women who were in critical condition

Investigator-administered validated well-structured questionnaire was used to collect data from all enrolled participants. The questionnaire was designed by reviewing previous studies of similar objectives, after which experts consultation was sought to ascertain its validity in public health perspective [11]. Required modifications were made and the questionnaire was administered in the language the participants understand.

Information collected includes socio-demographic information and history of PE (age, gestational age, marital status, employment status, residence, educational status, parity, personal and family history of PE).

Knowledge of PE was assessed based on a series of question regarding the awareness, signs/symptoms, risk factors and complications of PE. The questionnaire was close-ended with predefined choices. For instance, "What are some of the signs/symptoms of PE?" with response choices of "High blood pressure (during pregnancy) [Yes], [No] and [I don't know]". A scoring system, where a correct answer attracts a score of one (1) and a wrong or no response (or I don't know) attracts a score of zero (0) was used to scale participants' knowledge of PE. The scores were expressed as percentages and Bloom's cut-off point was employed to classify knowledge of PE into three levels: low (< 60%), moderate (60–80%) and high (80–100%). We then re-stratified the knowledge score into adequate (having a % score of  $\geq 60\%$ ) and inadequate knowledge of PE (having a % score of < 60%).

## Data analysis

Categorical and continuous variables were expressed as frequencies (percentages) and means  $\pm$  SD, respectively. Univariate logistic regression analysis was used to evaluate factors associated with adequate knowledge of PE. Variables with p-values < 0.25 from univariate analysis were selected for multivariate logistic regression analysis. A p-value < 0.05 was considered statistically significant. Statistical analyses were performed using GraphPad Prism 8 version 8.02.

## RESULTS

A total of 250 pregnant women with mean age and gestational age of 32.2 years and 26.6 weeks, respectively, were included in this study. A higher proportion of the participants were married (86.5%), employed (82.2%), resided in urban centers (89.0%) and had secondary education or below (59.5%). Four percent (3.0%) had experienced PE before and 5.6% had family history of PE. Table - 1

The prevalence of inadequate and adequate knowledge of PE was 86.5% (mean score =  $53.4 \pm 4.2$ ) and 12.4% (mean score =  $74.3 \pm 5.9$ ), respectively. For participants with adequate knowledge of PE, 10.1% (mean score =  $76.4 \pm 7.9$ ) and 4.2% (mean score =  $88.2 \pm 5.1$ ) had moderate and high knowledge, respectively, based on Bloom's cut-off point. Table 1 Sociodemographic characteristics and history of PE

More than half of the participant had heard of PE (63.6%). The highest proportion of correct responses regarding the signs/symptoms of PE were high blood pressure during pregnancy (41.2%) followed by persistent headache (35.6%) and oedema (21.2%). Family history of PE (39.6%) and having prior PE (35.2%) were the most correctly reported risk factors of PE whereas maternal

death (48.9%) and fetal death (47.6%) were the most accurately reported complications of PE. About 19.1% of the participants correctly responded that PE could be experienced at  $\geq 20$  weeks of gestation.

Using univariate logistic regression models, being older ( $> 35$  years old) [cOR = 3.09, 85% CI (0.88–10.88),  $p = 0.049$ ] and having a higher level of education ( $> SHS$  education) [cOR = 4.45, 95% CI (2.18–9.10),  $p < 0.0001$ ] were significantly associated with greater odds of having adequate knowledge of PE. After controlling for potential confounders in multivariate logistic regression analysis, we found higher level of education to be independently associated with adequate knowledge of PE [aOR = 3.87, 97% CI (1.31–6.30),  $p = 0.008$ ].

**Table 1: Characteristics**

Variable	Frequency	Percentage
<b>Marital status</b>		
single	34	13.6%
Married	216	86.5%
<b>Employment status</b>		
Unemployed	207	82.2%
Employed	43	17.2%
<b>Residence</b>		
Rural	28	11.2%
Urban	222	89%
<b>Educational status</b>		
$\leq SHS$	149	59.5%
$> SHS$	101	40.4%
<b>Is this your first pregnancy?</b>		
No	133	53.2%
Yes	117	46.8%
<b>Parity</b>		
$\leq 2$	156	62.4%
$> 2$	94	37.6%
<b>Experienced PE before?</b>		
Yes	8	3.2%
No	42	16.8%
I do not know	200	80%
<b>Family history of PE</b>		
Yes	16	5.6%
No	159	63.6%
I do not know	75	30%

**DISCUSSION**

In current studies have also reported low knowledge of PE among women. Which is correlated with Eze et al [13] reported that 60% of Tanzanian women had inadequate knowledge of PE. However You et al [14]., in the US reported a 43.3% knowledge of PE among women, with only 14% being able to provide the information that accurately define the syndrome. In Malaysia, a study by Teng and Keng found only 18.4% of women to have adequate knowledge of PE [15].

**Table 2: Antenatal women response to questions on knowledge of PE, risk factors, symptoms and complications**

Response	Frequency	Percentage
<b>Have you heard of PE?</b>		
Yes	159	63.6%
No	81	32.4%
<b>What are some of the signs/symptoms of PE?</b>		
High blood pressure	103	41.2%
Persistent headache	89	35.6%
Oedema	53	21.2%
Blurred vision	3	1.2%
chest pain	4	1.6%
abdominal pain	3	1.2%
Nausea and vomiting	7	2.8%
Back pain	3	1.2%
<b>What are some of the risk factor PE?</b>		
Family history of PE	99	39.6%
Having prior PE	88	35.2%
Obesity	46	18.4%
Diabetes	10	4%
Unhealthy lifestyle	4	1.6%
Multiple births	3	1.2%
<b>What are the some complications of PE?</b>		
Maternal death	122	48.8%
Fetal death	119	47.6%
Heart disease	4	1.6%
Kidney dysfunction	5	2%
<b>How severe is PE?</b>		
Very severe	123	49.2%
Severe	15	6%
Not severe	3	1.2%
I do not know	103	41.2%
<b>When is one likely to experience PE?</b>		
$\geq 20$ weeks of gestation	59	23.6%

Hypertensive disorders of pregnancy affect 10% of pregnancies and are defined by the International Society for the Study of Hypertension in Pregnancy (ISSHP) as new onset hypertension (140 mmHg systolic or 90 mmHg diastolic) after 20 weeks' gestation. In present study results showed that high incidences of inadequate knowledge of preeclampsia among our antenatal women's 216(86.5%). Furthermore, with participants with adequate knowledge 34(13.6%), only 4.2% had high knowledge of PE based on Bloom's cut-off point. This study indicates a correlation between good knowledge of PE and better clinical outcomes and vice versa. Thus, assessing and improving the knowledge of PE among high risk subjects such as pregnant women may be essential in mitigating the increasing prevalence of the disease and its associated adverse complications. More women would seek prompt

medical care when they are aware of the likely consequences of the symptoms they experience.

Though disquieting, the low knowledge of PE observed in this study could however be remedied since factors that influenced knowledge of PE were not static or general demographic factors. Evidently, the only significant factor that was independently associated with adequate knowledge of PE after adjusting for covariates that could confound the association was high educational level. This finding suggest that the use of an effective mode of educating women, possibly at antenatal visits and through. A study by Owolabi et al [16. in Nigeria also reported that women with PE were more likely to be illiterate. Cumulatively, owing to the plausible relationship between PE knowledge and improved clinical outcomes, these previous findingsreinforce our deposition that improving the knowledge ofPE among pregnant women

may be crucial to reducingthe prevalence, complications and mortalities associatedwith the disease.

## CONCLUSION

This study is however limited by observational design as it could not elucidate what kind, how much and to what extent an educational intervention will improve knowledge of PE or reduce adverse clinical outcomes. Another limitation of this study is that it was conducted in an urban setting and might not be generalizable to other areas especially rural areas. The awareness of preeclampsia along with pregnant women is low. The distinguished aspect that enables adequacy of information of PE is a better degree of education. This underscores the need for intensified effort to improve knowledge of PE among women for improved pregnancy outcomes.

## REFERENCE:

1. Milne F, Redman C, Walker J, Baker P, Bradley J, Cooper C, de Swiet M, Fletcher G, Jokinen M, Murphy D, Nelson-Piercy C, Osgood V, Robson S, Shennan A, Tuffnell A, Twaddle S, Waugh J, *et al.* The pre-eclampsia community guideline (PRECOG): how to screen for and detect onset of pre-eclampsia in the community. *BMJ* 330, 2005, 576–580.
2. Polsani S, Phipps E, Jim B, *et al.* Emerging new biomarkers of preeclampsia. *Adv Chronic Kidney Dis* 20, 2013, 271–279.
3. Soleymanlou N, Jurisica I, Nevo O, *et al.* Molecular evidence of placental hypoxia in preeclampsia. *J Clin Endocrinol Metab.* 90(7), 2005, 4299–308.
4. NICE clinical guideline 107: Hypertension in Pregnancy, Last modified: January 2011; [<http://www.nice.org.uk/nicemedia/live/13098/50418/50418.pdf>] (Accessed 25 November 2013).
5. Wilkinson J, Cole G. Preeclampsia knowledge among women in Utah. *Hypertens Pregnancy.* 37(1), 2014, 18–24.
6. Portelli M, Baron B. Clinical Presentation of Preeclampsia and the Diagnostic Value of Proteins and Their Methylation Products as Biomarkers in Pregnant Women with Preeclampsia and Their Newborns, *Journal of Pregnancy.* 2015(2632637), 2015, 23.
7. Owiredu W, Ahenkorah L, Turpin C, *et al.* Putative risk factors of pregnancyinducedhypertension among Ghanaian pregnant women. *J Med BiomedSci.* 1(3), 2012, 62–76.
8. Wang A, Rana S, Karumanchi SA, *et al.* Preeclampsia: the role of angiogenic factors in its pathogenesis. *Physiology* 24, 2009, 147–158.
9. Verlohren S, Herraiz I, Lapaire O, Schlembach D, Moertl M, Zeisler H, Calda P, Holzgreve W, Galindo A, Engels T, Denk B, Stepan H, *et al.* The sFlt-1/PIGF ratio in different types of hypertensive pregnancy disorders and its prognostic potential in preeclamptic patients. *Am J ObstetGynecol.* 2012.
10. Simhan HN, Caritis SN. Prevention of preterm delivery. *N Engl J Med* 357, 2007, 477–487.
11. Savage AR, Hoho L. Knowledge of pre-eclampsia in women living in Makole Ward, Dodoma, Tanzania. *Afr Health Sci.* 16(2), 2015, 412–9.
12. Savage AR, Hoho L. Knowledge of pre-eclampsia in women living in Makole Ward, Dodoma, Tanzania. *Afr Health Sci.* 16(2), 2015, 412–9.
13. Eze ED, Barasa A, Adams MD, *et al.* Determination, knowledge and prevalence of pregnancy-induced hypertension/eclampsia among women of childbearing age at same district Hospital in Tanzania. *Int J Med Med Sci.* 10(2), 2015, 19–26.
14. You WB, Wolf M, Bailey SC, *et al.* Factors associated with patient understanding of preeclampsia. *Hypertens Pregnancy.* 31(3), 2012, 341–9.
15. Teng SP, Keng SL, *et al.* Knowledge of preeclampsia among antenatal women in a tertiary referral teaching hospital. *Malays J Nurs.* 7, 2015, 8–13.
16. Owolabi A, Fatusi A, Kuti O, *et al.* Maternal complications and perinatal outcomes in booked and unbooked Nigerian mothers. *Singap Med J.* 49(7), 2008, 526.