

# Prevalence of Preeclampsia and eclampsia Risk factors among pregnant women in a tertiary care hospital, Ongole.

**Authors:** D.Narsimha, Sk.Juned,P.Prathyusha, P.Tarangini,Dr.J.BhargavaNarendra, Dr.A.Sridevi.

**Address:** Department of Pharmacy practice Qis college of Pharmacy,Vengamukkapalem Ongole, PIN : 523272.

## ABSTRACT

**Background:** Pre-eclampsia is a common problem during pregnancy which complicated 5 to 10 % of total pregnancies and 20 % of first pregnancies. Mothers with pre-eclampsia are at higher risk of maternal and fetal complications. The aim of this study was to estimate the prevalence of pre-eclampsia and eclampsia risk factors among pregnant women.

**Methodology:** the study was conducted at government general hospital using institutional based prospective observational study design among pregnant women who were diagnosed with preeclampsia and eclampsia. Data was collected by face to face interview technique using structured and pretested questionnaire about risk factors of preeclampsia and eclampsia such as age, family history, abortion, HTN, thrombophilia, diabetes before pregnancy, parity, renal failure, and twin birth. Gathered data analyzed by statistical methods in SPSS-23. The level of significance was  $p < 0.05$

**Results:** A total of 200 patients enrolled in the study in which 151 are included and 49 are excluded based on the criteria. Risk factor analysis using chi-square test shows among all the risk factors, history of preeclampsia, history of hypertension, antenatal checkups, pregnant women age, multiple gestation and body mass index are found to be significant.

**Conclusion:** The finding of this study showed that a considerable proportion of women had preeclampsia. Health seeking behavior towards pregnant women's should be encouraged for both urban and rural residents, which provide a chance to diagnose preeclampsia as early as possible and **to prevent the coming complication towards preeclampsia.**

**Keywords:** Hypertension, Prevalence, Preeclampsia, Eclampsia, Pregnant women,

# INTRODUCTION

## PRE-ECLAMPSIA

A potentially dangerous pregnancy complication characterized by high blood pressure.

Pre-eclampsia is a multisystemic disease characterized by the development of hypertension after 20 weeks of gestation in a previously normotensive woman, with the presence of proteinuria or, in its absence, of signs or symptoms indicative of target organ injury [1]. The clinical signs involve multiple organs, including the liver, kidneys, heart, lungs, brain, and pancreas. These complications can result in maternal and fetal adverse outcomes that can lead to intrauterine growth restriction, placental hypoperfusion, premature placental disruption or, in most serious situations, termination of pregnancy and fetal and maternal death [2,3].

This disease can be divided into mild and severe forms, according to the severity and type of the symptoms presented. The mild form of pre-eclampsia is characterized by systolic blood pressure (SBP)  $\geq 140$  mmHg or diastolic blood pressure (DBP)  $\geq 90$  mmHg, and proteinuria  $> 300$  mg/24 h [4,5]. The severe form of pre-eclampsia is characterized by severe hypertension (SBP  $> 160$  mmHg or DBP  $> 110$  mmHg), or severe proteinuria ( $> 2$  g/24 h), or signs and symptoms of target organ damage [4,5]. Women with severe preeclampsia may present headaches, visual disturbances (including blindness), epigastric pain, nausea and vomits, hepatic and renal insufficiency, and pulmonary edema [6].

Eclampsia represents the consequence of brain injuries caused by pre-eclampsia. It is

defined as pre-eclampsia with the abrupt development of seizures or coma during the gestational period or post-partum, non-attributable to other neurologic diseases that can justify the convulsive state (namely epilepsy or cerebral stroke) [1]. Eclampsia is the **rarest** [7] and most severe [8] of all the hypertensive disorders of pregnancy, with a high **maternal and fetal mortality** [9]

## ETIOLOGY:

According to some researches **endothelial activation or dysfunction** appears to be the central line in pathogenesis of preeclampsia but, what causes these endothelial activation or dysfunction is still a question. Whereas, some studies states that 4 hypothesis are helpful for a clarification.

- 1) Placental ischemia
- 2) VLDL versus toxic preventing activity
- 3) Immune maladaptation
- 4) Underlying disorders associated with preeclampsia

However, it should be stressed that they are not mutually exclusive but probably interactive.

## RISK FACTORS:

Preeclampsia develops only as a complication of pregnancy. Risk factors include:

The socio-demographic factors considered in the present analysis included **Age** (18-25, 26-30, 31-40 years); **Education** (no education, primary, secondary); **Employment status** (not working, working); **wealth index** (measured by an index based on household ownership of assets and graded as poor, middle, above middle) was computed using previously described methods; place of residence (urban, rural); The following maternal reproductive risk factors were

evaluated as potential confounding factors: total children ever born (CEB) (1, 2-3, 4+); **Preceding birth interval** (first birth order, interval 2years, interval 2-3years, interval 3+years); **Antenatal care** (ANC) visit during pregnancy (no visit, 1 visit, 2 visits, 3 visits, 4+ visits); **Blood pressure** measured during pregnancy (no, yes); received advice on pregnancy nutrition during **ANC visit** (no, yes); alerted to pregnancy complications such as convulsions (no, yes); **Type of pregnancy** (singleton, twin); ever had a terminated pregnancy (no, yes); **Anemia** level (not anemic, mild, moderate, severe). The biological and lifestyle factors included **Body Mass Index** ( BMI) kg/m<sup>2</sup> categories (Indian adult population standard; Indian consensus group 1996):  $\leq 18.4$  kg/m<sup>2</sup> (**underweight**), 18.5 to 22.9 kg/m<sup>2</sup> (**normal**), 23.0 to 24.9 kg/m<sup>2</sup> (**overweight**),  $\geq 25$  kg/m<sup>2</sup> (**obese**); current tobacco smoke (no, yes); **alcoholic** (no, yes); **diabetes** (no, yes); **asthma** (no, yes); **dietary intake variables** include frequency of consumption of milk/milk products, green leafy vegetables, fruits, pulses and beans, eggs, fish, chicken/meat— all categorized into daily, weekly, occasionally or/and never.[10]

## AIM AND OBJECTIVES

The aim of the study is to assess the prevalence and associated factors of preeclampsia among pregnant women attending antenatal care at government general hospital.

- The main objective of this study is to determine the socio-demographic and clinical risk factors associated with the cause of preeclampsia and eclampsia in a particular area.

## MATERIALS AND METHODS

### STUDY TYPE

A cross sectional observational study

### STUDY SITE

Department of obstetrics and gynaecology, Government General Hospital , Ongole , Andhra Pradesh, India.

### STUDY PERIOD

6 months [AUGUST 2019-JANUARY 2020]

### STUDY POPULATION

A total of 151 prenatal women were included in the study.

### DEPARTMENT

**OBSTETRICS AND GYNAECOLOGY** department in government general hospital.

### STUDY CRITERIA

The study will be carried out by considering following criteria.

#### Inclusion criteria:

- Pregnant women with pregnancy induced hypertension (PIH) & Proteinuria.

#### Exclusion criteria:

- History of seizures
- History of organ failure ( liver or kidney )
- History of abortions more than 3 times

**ETHICS COMMITTEE** :We had taken the ethics committee permission for collecting data by consent forms.

### DATA COLLECTION

- This was a cross sectional observational study that had been conducted on 200 women in which 151 patients were included and 49 were excluded. [29]

- We have collected the data in accordance to most prevalent risk factors of pre-eclampsia and eclampsia using a questionnaire which include demographic

details such as age, occupation, social habits, systemic examination and also the clinical risk factors such as history of hypertension, diabetes, Thyroid impairment etc.

•The questionnaire was adopted and modified from reviewing different literatures and scientific facts .Data was collected by face to face interview technique using structured questionnaire. Medical records were also reviewed for some clinical and laboratory results. [28]

## DATA ANALYSIS

The data obtained from the Questionnaire was analyzed in **Microsoft excel 2013** [Microsoft

corporation] and after data collection and summarization analysis on the data was performed using **STAT software SPSS**.

151 patients were compared with 49 patients who had pregnancy induced hypertension to determine the significant relationship of the risk factors between the two groups.

Chi-square test is used for the statistical analysis and comparison of disease among age group, history of pre-eclampsia, BMI, intervals of pregnancy

## RESULTS

Socio-demographic characteristics of the patients (n=151), Government General Hospital ,Ongole

Variables	Frequency	%
locality		
rural	150	99.20 %
urban	1	0.8%
age		
18-25	129	85.40 %
26-30	21	13.90 %
31-40	1	0.66 %
40+	0	0
Educational status		
Illiterate	42	27.8 %
Primary	99	65.56 %
Secondary	8	5.23 %
Graduation	2	1.32 %
Occupational status		
Daily wages	36	24 %
Employee	0	0
house wife	114	75.49 %
Student	1	0.66 %
Sleep		
Normal	136	90.06 %
Disturbed	15	9.93 %
Appetite		
Normal	138	91.39 %
Anorexic	13	8.609 %
Bowel and bladder habits		
Normal	121	80.13 %
Abnormal	30	19.86 %

Economic status		
Poor	119	78.80 %
Middle	32	21.10 %
Above middle class	0	0

Prevalence of preeclampsia and clinical characteristics of the patients (n=151), Government General Hospital, Ongole

Variables	Frequency	%
h/o preeclampsia		
1 <sup>st</sup> pregnancy	18	11.90 %
2 <sup>nd</sup> pregnancy	5	3.31 %
3 <sup>rd</sup> pregnancy	4	2.64 %
No	124	82 %
h/o hypertension		
yes	25	16.50 %
no	126	83.40 %
h/o thyroid disorders		
yes	12	8 %
no	139	92 %
h/o anemia		
yes	127	84.10 %
no	24	15.80 %
preceding birth interval		
1	16	10.50 %
1-2	16	10.50 %
2-3	31	20.50 %
>3	88	58.20 %
h/o abortions		
yes	22	14.50 %
no	129	85.40 %
ANC checkups		
Yes	56	37 %
No	95	62.90 %
Diabetes		
Yes	6	4 %
No	145	96 %
Parity		
Primipara	95	62.90 %
Multipara	56	37 %
Multiple gestation		
Yes	7	4.63 %
No	144	95.30 %
Body mass index		
<18.4	0	0
18.5- 24.9	50	33 %
25 – 29.9	81	54 %
>30	20	13.20 %

**statistical analysis :**

Variable	P-value
H/O preeclampsia	0.000028
H/O hypertension	0.000188
H/O thyroid disorders	0.641182
H/O anemia	0.368337
H/O abortions	0.964329
Preceding birth interval	0.05417
ANC checkups	0.026671
Pregnant women age	0.047112
Parity	0.355226
Diabetes	0.109682
Multiple gestation	0.038897
Body mass index	0.048846

Risk factor analysis using chi-square test shows among all the risk factors, **history of preeclampsia, history of hypertension, antenatal checkups, pregnant women age, multiple gestation and body mass index** are found to be significant



## DISCUSSION

This institutional based prospective observational study was conducted in government general hospital to identify the prevalence of preeclampsia and its associated factors. In addition to this, the finding of this study will have a significant role towards overcoming the problems associated with preeclampsia and which in turn helps to decrease the maternal morbidity and mortality associated with preeclampsia <sup>[11]</sup>. In the present study, 3 women had eclampsia and the rest had preeclampsia. These rates were higher than those reported in the other studies. This diversity can be due to **poor prenatal care** and **decreased mother's awareness on healthcare**.

To examine the hypothesis that if the **history of previous pre-eclampsia and eclampsia** is involved in its incidence, the present study was conducted and it was found that **19.9%** of the mothers had a history of previous pre-eclampsia, of whom **56.6%** had pre-eclampsia in first pregnancy and **30%** had pre-eclampsia in second pregnancy and **14%** in third pregnancy. Here upon, it can be claimed that in women with previous history of pre-eclampsia the incidence rate of preeclampsia and eclampsia were **greater**. <sup>[12]</sup> **73.7%** of the mothers are of below **25** years, of whom **93.3%** had pre-eclampsia and **6.7%** had eclampsia.

Another research question of this study was: does twinning have effect on the incidence of pre-eclampsia or eclampsia? The results showed that **4.63%**(n=7) women had twinning, of them **45%** i.e 3 patients had pre-eclampsia. But **95.3%**(n=144) of the mothers who didn't have twinning were with preeclampsia. Thus, it can be concluded that the

incidence of pre-eclampsia in mothers with twinning is higher than mothers without.

In this study, **14.50%**(n=22) of the mothers with pre-eclampsia and eclampsia had a history of abortion, of which **13.63%**(n=3) had eclampsia and **86.36%**(n=19) had pre-eclampsia. The incidence of pre-eclampsia in mothers with abortion was slightly higher than mothers without abortion.

Does presence of thyroid disorders in women affect pathogenesis of pre-eclampsia and eclampsia? In the entire sample, there were **7.94%** (n=12) patients are with with thyroid disorders who had preeclampsia, however, this relationship was statistically significant. Exploring the relationship between the prevalence of eclampsia and pre-eclampsia and body mass index during pregnancy, it was found that in mothers with high body mass index, the prevalence of pre-eclampsia was **67.20%** (n=101) in which 81 patients (**54%**) are overweight and 20 patients (**13.20%**) are obese and remaining 50 patients (**33 %**) are with normal BMI and it can be said that this factor can affect the incidence of pre-eclampsia. Therefore, it seems necessary to take proper precautions and effective control over body weight in women regarding the risk of having pre-eclampsia.

In our study **16.50 %** (n=25) patients had a history of hypertension. Therefore, it can be said that rate of pre eclampsia was higher in women with chronic hypertension.

## CONCLUSION

The results of this study revealed that the prevalence of pre-eclampsia had **no significant** difference in government general hospital compared to other studies. Various factors may be involved in the incidence of eclampsia and preeclampsia, which among them pregnant women age, high body mass index, multiple gestation, preceding birth interval, chronic hypertension in mother, diabetes before pregnancy and number of pregnancies can be noted. In order for the mothers to be prevented from having eclampsia or pre-eclampsia during pregnancy, it is suggested that future studies to be undertaken in more detailed ways and over larger sample. Therefore, health seeking behavior towards pregnant women's should be encouraged for both urban and rural residents, which provide a chance to diagnose preeclampsia as early as possible and to prevent the coming complication towards preeclampsia.

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**QUESTIONNAIRE ON RISK FACTORS OF PREECLAMPSIA AND ECLAMPSIA :****DEMOGRAPHIC DETAILS:**

Patient name : Gender : Age :

IP. no : Ward : Date :

Occupation : ☐ dailywages ☐ employee ☐ house wife ☐ student

Location : ☐ urban ☐ rural

Sleep : ☐ normal ☐ disturbed

Appetite : ☐ normal ☐ anorexic

Bowel and bladder habits : ☐ normal ☐ abnormal

Education : ☐ illiterate ☐ primary ☐ secondary ☐ graduation

Economic status : ☐ poor ☐ middle ☐ above middle class

Chief complaints :

**Past medical history :**

1) H/o Preeclampsia ☐ 1<sup>st</sup> pregnancy ☐ 2<sup>nd</sup> pregnancy ☐ 3<sup>rd</sup> pregnancy ☐ 4<sup>th</sup> pregnancy

2) H/o Hypertension ☐ yes ☐ no

3) H/o Diabetes ☐ yes ☐ no

4) H/o Thyroid disorders ☐ yes ☐ no

5) H/o Anemia ☐ yes ☐ no : if yes specify .....

6) Preceding birth interval ☐ 1 ☐ <2 ☐ 2-3 ☐ >3

7) Family h/o preeclampsia ☐ yes ☐ no

8) H/o Abortions ☐ yes ☐ no

If yes , specify ☐ maternal age ☐ preterm birth ☐ HTN ☐ accidental

**Present condition :**

1) Having regular ANC checkups ☐ yes ☐ no

2) Whether the pregnant women is ☐ booked ☐ unbooked

If booked , no of visits.....

3) Pregnant women age ☐ 8-25 ☐ 26-30 ☐ 31-40 ☐ 40+

4) Diabetes ☐ yes ☐ no

If yes, specify ☐ gestational ☐ DM ☐ DI

5) Preeclampsia developing trimester ☐ 1<sup>st</sup> ☐ 2<sup>nd</sup> ☐ 3<sup>rd</sup>

6) Patient observable weight gain ☐ yes ☐ no

Mention gained weight .....

7) Proteinuria ☐ yes ☐ no

8) Parity ☐ primipara ☐ multipara

9) Multiple gestation ☐ yes ☐ no

10) Kidney disorders ☐ yes ☐ no

11) Hydatidiform mole ☐ yes ☐ no

If appeared ☐ partial molar ☐ complete molar

12 ) BMI ☐ <18.4 ☐ 18.5-24.9 ☐ 25-29.9 ☐ >30

13) Oedema ☐ face ☐ upper limbs ☐ lower limbs ☐ vulva

14 ) Social habits ☐ alcoholic ☐ ☐ ☐  
smoker drug abuse no

