

## Magnitude of Edema and Proteinuria and its Impact on Pregnancy Outcome in Pre-Eclampsia.

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### Abstract

**Background:** The aim of this study to assess the Pregnancy outcome in Preeclampsia in terms of magnitude of edema and proteinuria.

**Materials and methods:** A Prospective study to assess the Magnitude of edema and Proteinuria and its impact on pregnancy outcome in Preeclampsia was conducted at Department of Obstetrics and Gynecology at Chigateri Government Hospital, Davanagere from January 2013 to June 2013. A 100 pregnant women with Preclampsia more than 20 weeks of gestation to 40 weeks of gestation were selected. Pregnant women with Chronic Hypertension, Diabetes Mellitus, Renal disease, Heart disease, Babies with Congenital malformations were excluded from the study. Qualitative estimation of Proteinuria and edema was done for all patients.

**Results:** A total of 100 cases were selected for the study. The maternal complications were found in 56% and perinatal complications in 57% of the Preeclamptic women. As the level of Proteinuria and magnitude of edema increases, there is higher incidence of maternal and perinatal complications which was statistically significant. The maternal complications include Abruptio, Eclampsia, Anemia, Postpartum haemorrhage, HELLP Syndrome, Ascites, Instrumental deliveries and more chances of Caesarean section. The perinatal complications include Intrauterine fetal death, Intrauterine growth restriction, Still birth, Prematurity, Low Apgar score and Neonatal mortality.

**Conclusion:** In women with Pre-eclampsia, as the magnitude of proteinuria and edema increases, the maternal and perinatal complications also increase. Regular antenatal care for all the pregnancies. Early detection and treatment of pre- eclapmsia to prevent progression to more severity of the disease reduces the maternal and the perinatal morbidity and mortality.

**Keywords:** Preclampsia, Proteinuria, edema, Pregnancy outcome.

## Introduction

Hypertensive disorders of pregnancy complicate about 8% of all gestations and are responsible for significant maternal and perinatal morbidity and mortality.<sup>1</sup>

Preeclampsia is a common pregnancy specific syndrome that originates in the placenta and accounts for a considerable proportion of both maternal and perinatal deaths, while hypertension without proteinuria generally has a far more benign course. It usually develops after 20 weeks of gestation and resolves after delivery of the placenta. Several classifications of hypertension in pregnancy have been used, of which the classification of hypertensive disorders by the Working Group of the National high blood pressure education program [NHBPEP] (2000) has widest acceptance.<sup>2</sup> There are four types of hypertensive disease:

1. Gestational hypertension
2. Preeclampsia and Eclampsia
3. Preeclampsia superimposed on Chronic hypertension
4. Chronic Hypertension

It affects 3-5% of all the pregnancies.<sup>2</sup> In India, there is 5-15% incidence of Pre-eclampsia.<sup>2</sup> It causes 10-15% maternal deaths in the developing countries.<sup>2</sup> The reason for increased maternal mortality and morbidity in developing countries are social deprivation, lack of access to trained birth attendants, lack of education, late referral to tertiary centres, lack of transport, unbooked status of the patient, nulliparity, prolonged state of unconsciousness and multiple seizures prior to admission.<sup>4</sup>

Preeclampsia affects both the mother and the fetus. Despite several decades of research, while etiology remains elusive, the definitive treatment is clear termination of pregnancy. As termination of pregnancy is the only effective treatment or cure for preeclampsia, it is always the treatment of choice for the mother. However, for the fetus remote from term, prolongation of pregnancy might be more appropriate in certain cases. Traditionally this approach of balancing the interests of the mother and the fetus has been adopted in the management of preterm pregnancies with mild preeclampsia. On the other hand, women with severe preeclampsia have been delivered without delay, regardless of fetal considerations.<sup>5</sup> This aggressive management with immediate delivery of a fetus remote from term leads to high perinatal mortality and morbidity resulting from prematurity. Consequently hospitalisation in NICU is prolonged and some surviving infants may have long term disabilities.<sup>6,7</sup>

As severe preeclampsia became known as a heterogenous condition and the methods improved for monitoring maternal and fetal wellbeing, some challenged the view that patients with severe preeclampsia must always be delivered expeditiously. To address this question, several prospective studies were conducted to assess the potential maternal risks and neonatal benefits of delaying delivery. Because immediate delivery is always the optimal management for the mother, demonstrable benefit to the newborn is essential to justify the postponement of delivery.

Preeclampsia is associated with increased risk of maternal mortality and maternal morbidities like convulsions, abruptio placenta, acute renal failure, cerebrovascular and cardiovascular complications, liver hemorrhage, disseminated intravascular coagulation and stroke.

The infants of preeclamptic mothers have a significantly higher incidence of prematurity, somatic growth retardation, thrombocytopenia, low apgar scores, delayed adaptation, patent

ductus arteriosus and gastrointestinal hypomotility. Prematurity is the most important factor responsible for increased perinatal morbidity and mortality.

How pregnancy incites or aggravates hypertension remains unsolved despite decades of intensive research. It is hence a challenge to be addressed and overcome if there is to be any significant improvement in maternal and perinatal health. Recent research, in offering the possibility of prophylaxis as well as improved methods of medical and obstetric management has given us a better understanding of the etiopathology of preeclampsia. Currently there are exciting prospects of preventing preeclampsia through the modulation of vasoactive, intravascular events relatively using simple medical therapy.

The management of preeclampsia has gone through many changes and has achieved good results with the introduction of Newer Antihypertensives, Different regimes of Anticonvulsants and also increased awareness of the people.

### Objective:

- To study the pregnancy outcome depending on the magnitude of oedema in pre-eclamptic patients.
- To study the pregnancy outcome depending on the magnitude of proteinuria in pre-eclamptic patients.

### Materials and Methods:

Source- A prospective study conducted on pregnant women >20 weeks to 42 weeks admitted to Chigateri Hospital, Davangere during January to June 2013.

Method of collection- 100 pregnant women with pre-eclampsia

### Inclusion criteria-

- >20 weeks to 42 weeks of gestation
- BP> 140/90 mm Hg with proteinuria

### Exclusion criteria-

- Chronic HTN, Diabetes mellitus, Heart disease, Renal disease, Babies with Congenital malformations.

**Table 1: GRADING OF PROTEINURIA 5**

|        | Concentration | Daily      |
|--------|---------------|------------|
| Traces | 5-20mg/dl     |            |
| 1+     | 30mg/dl       | <0.5/day   |
| 2+     | 100mg/dl      | 0.5-1g/day |
| 3+     | 300mg/dl      | 1-2g/day   |
| 4+     | >2000mg/dl    | >2g/day    |

**Table 2: UNICEF REF: GRADING OF EDEMA 6**

|                  |                                     |
|------------------|-------------------------------------|
| <b>GRADE I</b>   | <b>Involves feet and ankles</b>     |
| <b>GRADE II</b>  | <b>Involves legs and lower arms</b> |
| <b>GRADE III</b> | <b>Generalised edema</b>            |

**Results:**

- Among 100 women who fulfilled the criteria, the maternal complications were found in 56% and perinatal complications in 57% of the women.
- Table 1- Shows Pregnancy outcome in relation to proteinuria

**Table 3:**

| Grades of Proteinuria | Number of cases | Maternal Complications | Perinatal Complications |
|-----------------------|-----------------|------------------------|-------------------------|
| 1+                    | 20              | 5(25%)                 | 3(15%)                  |
| 2+                    | 14              | 6(42%)                 | 7(50%)                  |
| 3+                    | 21              | 14(67%)                | 15(71%)                 |
| 4+                    | 45              | 31(69%)                | 31(69%)                 |

- As the level of proteinuria increases, there is higher incidence of both maternal and perinatal complications which is statistically significant ( $p < 0.01$  and  $p < 0.001$ ).

Table 2- Shows pregnancy outcome in relation to edema

**Table 4:**

| Grading of Edema | Number of cases | Maternal complication | Perinatal Complication |
|------------------|-----------------|-----------------------|------------------------|
| I                | 25              | 11(44%)               | 5(20%)                 |
| II               | 52              | 30(58%)               | 31(60%)                |
| III              | 23              | 18(78%)               | 21(91%)                |

- As the magnitude of edema increases as in generalised edema, the maternal and perinatal complications increases and which is statistically significant ( $p < 0.05$  and  $p < 0.001$ ).

**Table 5: Shows maternal outcome in relation to proteinuria**

| Complications         | 1+ (20) | 2+ (14) | 3+ (21)  | 4+ (45)   |
|-----------------------|---------|---------|----------|-----------|
| Eclampsia             | -       | 2(14%)  | 4(19%)   | 18(40%)   |
| Abruptio              | 1(5%)   | 2(14%)  |          | 3(6.6%)   |
| Anaemia               | 2(10%)  | 2(14%)  | 2(9.5%)  | 5(11%)    |
| PPH                   | 1(5%)   |         |          | 2(4.4%)   |
| LSCS                  | 5(25%)  | 5(35%)  | 1(4.7%)  | 12(26.6%) |
| Instrumental Delivery | 3(15%)  |         | 6(28.5%) | 11(24.4%) |
| HELLP                 |         | 1(7%)   | 1(4.7%)  |           |
| Ascites               |         |         | 1(4.7%)  |           |

**Table 6: Shows perinatal outcome in relation to proteinuria**

| Complications          | 1+     | 2+       | 3+        | 4+        |
|------------------------|--------|----------|-----------|-----------|
| IUD                    |        | 1(7.1%)  |           | 4(8.8%)   |
| Still birth            |        |          | 1(4.7%)   | 2(4.4%)   |
| Prematurity            | 1(5%)  | 2(14.2%) | 7(33.3%)  | 9(20%)    |
| IUGR                   | 3(15%) | 5(35.7%) | 11(52.3%) | 25(55.5%) |
| APGAR<br>1 <6<br>5 < 8 | 6(30%) | 7(50%)   | 14(66%)   | 28(62.2%) |
| Neonatal mortality     |        |          |           | 3(6.6%)   |

**Table 7: Shows maternal outcome in relation to edema**

| Complications            | Grade I (25) | Grade II (52) | Grade III (23) |
|--------------------------|--------------|---------------|----------------|
| Eclampsia                | 1(4%)        | 11(21%)       | 12(52.1%)      |
| Abruptio                 |              | 4(76%)        | 2(8.6%)        |
| Anaemia                  | 4(16%)       | 6(11.5%)      | 11(47.8%)      |
| PPH                      | 1(4%)        |               | 2(8.6%)        |
| LSCS                     | 7(28%)       | 13(25%)       | 3(13%)         |
| Instrumental<br>Delivery | 3(12%)       | 8(15.3%)      | 9(39%)         |
| HELLP                    |              |               | 1(4.3%)        |
| Ascites                  | 1(4%)        | 1(2%)         |                |

**Table 8: Shows Perinatal outcome in relation to Edema**

| Complications          | Grade I | Grade II  | Grade III  |
|------------------------|---------|-----------|------------|
| IUD                    | 1(4%)   | 1(2%)     | 2(8.6%)    |
| Still birth            |         |           | 2(8.6%)    |
| Prematurity            | 2(8%)   | 9(17.3%)  | 8(34.7%)   |
| IUGR                   | 4(16%)  | 23(44.2%) | 14(60.8%)  |
| APGAR<br>1 <6<br>5 < 8 | 11(44%) | 30(57.6%) | 14(60.86%) |
| Neonatal mortality     |         |           | 3(13%)     |

## Discussion

Pre-eclampsia is a common pregnancy specific syndrome that originates in placenta and is associated with fetal risks and maternal risks.<sup>3</sup> Pre-eclampsia associated with massive proteinuria and generalised edema are associated with increased maternal and perinatal morbidities and mortalities, while hypertension without proteinuria generally has a far more benign course.<sup>3</sup> It usually develops after 20 weeks of gestation and resolves after delivery of the placenta. In this study patients with proteinuria and edema, show a significantly increased rates of convulsions, instrumental deliveries, cesarean sections, HELLP syndrome and maternal mortality. The present study confirms the strong influence of proteinuria and edema on fetal outcome in pre-eclampsia. Heavy proteinuria and generalised edema was associated with higher incidence of growth restriction. The reduction of the mean birth weight is explained by the prevalence of SGA infants and preterm infants. Prematurity is the most important factor responsible for increased perinatal morbidity and mortality. Proteinuria and edema could be considered a clinical late marker of vascular damage and a negative factor for fetal and maternal outcome in pre-eclampsia.

## Conclusion

In women with Pre-eclampsia, as the magnitude of proteinuria and edema increases, the maternal and perinatal complications also increase. Regular antenatal care for all the pregnancies. Early detection and treatment of pre-eclampsia to prevent progression to more severity of the disease. Facility to transfer those patients to referral centres. All the deliveries should be institutional. Availability of sufficient amount of blood and blood components for transfusion at any time. Very importantly, health education to the patient and her relatives. Training for the health personell at the peripheral health centres to refer these patients well in advance to higher centres thus to prevent complications.

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