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Maternal and Neonatal Outcomes in Women with Preeclampsia

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Summary
Background: *Preeclampsia is a pregnancy-specific hypertensive syndrome associated with significant morbidity and mortality in mother and neonate. It is the 3rd leading cause of maternal mortality and is responsible for 15-20% of maternal mortality and is a major cause of neonatal morbidity and mortality.*
Objective: *The objective of this study was the effects of pre-eclampsia associated with maternal complications, pregnancy outcome and neonatal complications.*
Materials and Methods: *A hospital based descriptive observational study was conducted from July to December 2017.All pre-eclampsia associated with complications were included. Data obtained that included maternal age, systolic and diastolic blood pressures, gestational age at diagnosis, gestational age at delivery, associated maternal complications, pregnancy outcome, mortality, birth-weight and neonatal complications.*
Results*: The mean parity was higher in the normotensive group than in the preeclamptic patients (2.3+0.65 vs 3.6+0.74;p =<0.05).cesarian section rates were significantly higher in the group with preeclampsia than in the control group, in the preeclamptic women undergoing vaginal delivery,31% of them underwent induction of labour. The most common complication associated with preeclampsia is eclampsia (21%). The most common indication for induction of labour was severity of pre eclampsia among the patients 9% of them were admitted with intra uterine demise, while 91 neonates survived. The most common causes of neonatal mortality were congenital abnormalities and respiratory distress syndrome.*
Conclusion: *Gestational age, parity, cesarean section rate, the rate of induced labor, and low birth weight neonates were more frequent in pre-eclamptic women than in healthy pregnant women*
Key Words: *morbidity, mortality, neonate, outcome, preeclampsia*

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I. Introduction

Pre-eclampsia is a disease of multiple organ systems that is unique to pregnancy and is often associated with significant maternal and neonatal morbidity and mortality[1].Pre-eclampsia complicates 2-8% of all pregnancies and is a major cause of maternal and perinatal morbidity and mortality including premature births.[2]

A number of social, genetic, medical and obstetric conditions predispose to an increased risk of pre-eclampsia[3].Pre eclampsia is one of the most common cause for obstetric complications which need ICU admissions. The causes of ICU/HDU admissions in pre eclampsia include hypertensive crisis leading to neurological complications like altered sensorium, cerebral edema or HELLP syndrome progressing to hemorrhagic or acute neurological complications. Severe pre eclampsia or eclampsia lead to intracranial hemorrhage, diffuse cerebral edema or pregnancy related ischemic strokes4.The main impact on the fetus is under nutrition as a result of utero-placental vascular insufficiency, which leads to growth retardation. The immediate impact observed is altered fetal growth resulting in greater fetal liability. Fetal health as well as its weight are highly compromised, leading to various degrees of fetal morbidity, and fetal damage may be such as to cause fetal death[5].

II. Materials and Methods

We analyzed retrospectively all consecutive women with preeclampsia during the period from July to December 2017 at Government General Hospital, Kakinada. Data of 100 pre-eclamptic women were extracted from the clinical records. Maternal age, maternal weight, systolic and diastolic blood pressures, parity, type of delivery, gestational age, birth weight, maternal and neonatal complications and mortality were included as study variables and were compared with 100 normotensive pregnant women as control group. The two groups were matched for age, date of delivery. Patients were excluded from either group if they had hydatidiform mole, diabetes mellitus, or history of renal, cardiac or vascular diseases. Preeclampsia was defined as the increase in diastolic blood pressure (≥ 90 mmHg) and proteinuria (≥ 1+ by dipstick testing).

Statistical analysis
The quantitative variables are presented by their frequency along with percentage. The quantitative variables are presented by their mean ± SD values

III. Results

From July to December 2017, 3230 pregnant women were admitted to Government General Hospital, Kakinada of which 100 were pre-eclamptic patients.
Demographic characteristics of the study and are shown in Table 1

Table1. Demographic characteristics in preeclamptic and healthy pregnant women

Characteristics	Patient Group (n=100)	Control Group (n=100)	P
Gestational age	39±2	37±2	<0.05
Weight(Kg)	73.6±3.2	64.6±2.3	<0.001
Systolic blood Pressure(mmHg)	165±5.0	125±5.0	<0.001
Diastolic blood Pressure(mmHg)	108±4.3	79±2.5	<0.001
Parity	2.3±0.65	3.6±0.74	<0.05
Age	25.9±5	24.5±4.8	<0.001

The mean gestational age in the study group was higher than that in the control group (39 ± 2 vs. 37 ± 2 gestational weeks; $p < 0.05$).The mean parity in normotensive patients was higher than that in preeclamptic patients (3.6 ± 0.74 vs. 2.3 ± 0.65; $p < 0.05$).
Mode of the delivery among the study participants in two groups shown on Table 2,

Table 2: Mode of the delivery among the study participants in two groups

Mode of delivery	Patient Group (n=100)	Control Group (n=100)
Lower segment Cesarian section	59(59%)	18(18%)
Normal delivery	41(41%)	82(82%)

59% of preeclamptic and 18% of healthy pregnant women required cesarean section, with occurrence being more frequent in the patient group. The most frequent indication of cesarean section in the preeclamptic group was previous cesarean section, whereas in normotensive women, it was fetal distress.
Preeclamptic women undergoing vaginal delivery, 31% of them underwent induction of labor. The common reasons for inducing labor were severity of preeclampsia, premature rupture of fetal membrane (12%), post-term pregnancy (8%), abruption placenta (5%), and intrauterine fetal demise (IUFD).
Maternal complications associated with Pre-eclampsia and are shown in Table 3

Table 3: Maternal complications associated with Pre-eclampsia

Maternal Complications	Number	Percentage
Acute renal failure	4	4%
Acute respiratory distress syndrome	4	4%
Placental abruption	5	5%
Post partum heamorrhage	18	18 %
Pulmonary edema	3	3%
HELLP syndrome	2	2%
Retinal detachment	1	1%
Eclampsia	21	21%
Pulmonary embolism	1	1%
Dissaminated intravascular coagulopathy	2	2%
Neurological complications	1	1%

In our study 62 (62%) pre eclamptic patients were noted to have maternal complications. Including 21with eclampsia and 2 with HELLP Syndrome and 1 with neurological complications which was referred from periphery.post partum hemorrhage occurred in 18 preeclamptic women 9 needed blood transfusions and 1 needed intensive monitoring and 5 with abruption 2 were delivered by cesarian section associated with intensive monitoring remaining 3 delivered by vaginal route. Three mortality were noted among the pre eclamptic patients. One patient expired due to Dissaminated Intravascular Coagulopathy (DIC), second maternal mortality due to HELLP syndrome, third maternal mortality due to pulmonary embolism.
Neonatal complications associated Preeclamptic are shown in table 4 below

Table 4: Neonatal complications associated with Preeclampsia

Neonatal Complications	Number	Percentage
Preterm	21	21%
Intra uterine growth retardation	10	10%
Intra uterine fetal demise	9	9%
Congenital anamolies	8	8%
Low birth weight	22	22%
Still birth	3	3%

The birth weight was statistically significantly lower (22%) in women with preeclampsia than in women with normal blood pressure. The mean Apgar score in neonates at 1 and 5 minutes of the preeclamptic group were 7.6 and 8.8 respectively, which were lower than for neonates of healthy women (8.9 and 9.9 at 1 and 5 minutes, respectively).

According to the results, only cesarean delivery was more frequent in preeclamptic women.

100 preeclamptic women, 9 patients were admitted with IUFD, while 91 neonates survived for the remaining patients. Common causes of neonatal mortality were congenital abnormalities (eight neo-nates), respiratory distress syndrome (six neonates), dystocia (two neonates), and premature rupture of fetal membrane (five neonates) only three were admitted to hospital for respiratory distress syndrome, only eight of whom was delivered by cesarean section.

IV. Discussion:

Hypertension is an important cause of both maternal and fetal morbidity and mortality in pregnant women. The reduction in morbidity and mortality in the treatment of preeclampsia is important[6], and the high perinatal mortality associated with this disorder has fallen significantly[7].

In previous studies, it was concluded that women with hypertension in pregnancy, particularly if they are more than 30–35 years old, overweight, and with previous history of hypertension, must be carefully managed by expert physicians in order to decrease the complications[10].

Preeclampsia affects approximately 4.5–11.2% of pregnancies in industrialized countries and occurs more commonly in patients at the extreme ends of the reproductive age range. It is seen more often in primigravida women than in multiparous women. Recent epidemiologic studies suggest that multiparous women with different partners have a higher risk for preeclampsia than multiparous women with the same partner, perhaps because of a protective effect of repeated exposure to specific antigens[11].

In this study, the frequency of cesarean section was higher in preeclamptic women. Similarly, Al-Mulhim et al's study showed that vaginal deliveries were less frequent in women with preeclampsia (69.2%) as compared with healthy controls (86.2%) [12]. Also, in Bozhinova et al's study, normal delivery was attained with 48.8% and cesarean section with 47.6% of the pregnancies[13]. Witlin et al found that operative delivery by cesarean section in pregnancies with pre-eclampsia reduced complications to the fetus as well as the mother[14].

In our study, the most frequent indication of cesarean section in the preeclamptic group was a previous cesarean section. Vaginal delivery is safer than cesarean section in women with preeclampsia–eclampsia and usually should be attempted unless there are other obstetric indications for cesarean delivery. Certain women at preterm gestation with severe preeclampsia or eclampsia in whom the cervix is unfavorable for vaginal delivery may benefit from cesarean section with-out attempting labor induction[11]. Odegard et al found that previous history of preeclampsia strongly increased the risk for preeclampsia in the current pregnancy, and the risk of early onset preeclampsia was especially high[15]. They showed that heterogeneous clinical manifestations of preeclampsia might be preceded by different pathologic mechanisms.

In our study, 31% of preeclamptic women who underwent vaginal delivery had undergone induction of labor. A study showed that the hypertensive group had high incidence of induced labor and an increased risk for low birth weight[16].

We found that the birth weight was lower in women with preeclampsia. Similarly, Hiett et al found that the mean birth weight of preeclamptic neonates was significantly lower than that of controls[17].

In this study 9% of preeclamptic women were admitted with IUFD, whereas in Murphy et al's study, this complication occurred in 16% of the patients[18]. Also, our study showed that respiratory distress syndrome was an important cause of neonatal mortality. In Wiltin et al's study, it was directly related to cesarean section, and the survival was directly associated with birth weight[14].

Limitations: The severity of preeclampsia was not considered as a variable in this study.

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