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PREGNANCY OUTCOME IN ECLAMPSIA INFLUENCED BY THE MODE OF DELIVERY

Obstetrics & Gynaecology

Dr. Pooja Phadtare Junior Resident, Department of Obstetrics and Gynecology, Government Medical College and Hospital, Aurangabad-431001, Maharashtra, India

Dr. Sonali Deshpande* Associate Professor, Department of Obstetrics and Gynecology, Government Medical College and Hospital, Aurangabad-431001, Maharashtra, India *Corresponding Author

Dr. Shrinivas Gadappa Professor and Head, Department of Obstetrics and Gynecology, Government Medical College and Hospital, Aurangabad-431001, Maharashtra, India

Dr. Swati Badgire Assistant Professor, Department of Obstetrics and Gynecology, Government Medical College and Hospital, Aurangabad-431001, Maharashtra, India

Dr. Nisha Jha Junior Resident, Department Of Obstetrics And Gynaecology , Government Medical College And Hospital Aurangabad-431001, Maharashtra , India

Dr. Shreya P Aaglawe Junior Resident 3, Department Of Obstetrics And Gynaecology , Government Medical College And Hospital Aurangabad-431001, Maharashtra , India

Dr. Apoorva Somshekhar Sholapure Junior Resident, Department Of Obstetrics And Gynaecology , Government Medical College And Hospital Aurangabad-431001, Maharashtra , India

ABSTRACT

BACKGROUND: To study the association between mode of delivery and maternal and perinatal outcome in eclampsia. **METHODS:** This was a tertiary care based prospective observational study conducted in the Department of Obstetrics and Gynecology, between the study period October 2018-September 2020.A total 165 cases of eclampsia, with >32 weeks gestation, reassuring foetal heart and no other complications were included in the study. They were divided into two groups; Group I undergoing planned vaginal delivery, Group II undergoing early caesarean delivery, maternal and perinatal outcome was analysed and compared between the two groups. **RESULT:** Maximum number 75 (45.45%) of the study participants were in between 37.1-40 weeks of gestation at the time of admission, Majority of the study participants 125 (75.76%) had an unfavorable cervix i.e., Bishop's score ≤5 on initial assessment at the time of admission. There was no maternal mortality in our study. There was no statistically significant difference in maternal morbidity. The still births and perinatal deaths were seen to be higher in the planned vaginal delivery group (1 still birth and 3 perinatal deaths). Perinatal morbidity was affected by mode of delivery of delivery, gestational age, BISHOP's score, number of convulsions at time of induction and convulsion delivery interval. **CONCLUSIONS:** The maternal outcome was seen to be comparable between both the groups and there was no statistically significant difference between them, the perinatal outcome was better in the early caesarean delivery group as compared to the planned vaginal delivery group, specifically in those with an unfavorable cervix and away from term. Early caesarean section to expedite delivery cannot be recommended for all cases of ante partum eclampsia.

KEYWORDS

early cesarean delivery, planned vaginal delivery, ante-partum eclampsia.

INTRODUCTION:

Eclampsia is considered a complication of severe preeclampsia, is commonly defined as new onset of grandmal seizure activity and/or unexplained coma during pregnancy or postpartum in a woman with signs or symptoms of preeclampsia[7].Eclampsia remains one of the major causes of maternal morbidity and mortality especially in the developing countries. The high maternal morbidity and mortality due to eclampsia in the developing countries has been ascribed to late referral, delay in hospitalization, lack of transport, unbooked status of pregnant women and multiple seizures prior to admission[5].But various aspects of the pregnant woman are strong determinants in the occurrence of disease as well as maternal and perinatal outcome[9].

It is recommended that all women with eclampsia should be delivered within 12 hours of admission[10]. To achieve quick delivery caesarean section has been preferred when the cervix is unfavorable and the woman is unlikely to deliver early, more commonly in pre- term cases presenting with ante partum eclampsia. Incidence of caesarean deliveries in eclampsia varies widely i.e., from 26.7-71%[6]. Pritchard et al[2] had a caesarean section rate of 25%, while in eclampsia collaborative trial the incidence was 70%.[11]

There are very few studies evaluating the optimum method of delivery in eclampsia. Considering mode of delivery could be a contributing factor in the outcome of eclampsia, a pilot study concluded that early caesarean is not associated with better outcomes, although neonatal outcomes showed a trend toward improvement with early caesarean delivery.[12]However, since time immemorial vaginal route has been the preferred mode of delivery in eclampsia but at the cost of an adverse perinatal outcome.

This study was conducted since our hospital being a tertiary health care center, has a large number of eclamptic pregnant women being referred from rural hospitals, sub district hospitals and private hospitals and also since there have been very few studies on the route of delivery affecting maternal and perinatal outcome in eclampsia we decided to go forth with this study. The main aim of this study was to study the maternal and perinatal outcome in early caesarean section and planned vaginal delivery in antepartum eclampsia and to compare the maternal and perinatal outcome in both the groups.

METHODS AND MATERIAL:

This was a tertiary care based prospective observational study. 165 cases of eclampsia were identified after satisfying inclusion and exclusion criteria. They were divided into two delivery groups. Group I undergoing planned vaginal delivery, Group II undergoing early caesarean delivery (Caesarean section undertaken as early as possible after initial stabilization and necessary assessment using complete blood count and coagulation profile using bleeding time and clotting time.)

INCLUSION CRITERIA:

≥32 weeks gestation, singleton, cephalic pregnancy with normal fetal heart rate and willing to participate in study.

EXCLUSION CRITERIA:

Ante-partum eclampsia with <32 weeks gestation, post-partum eclampsia, intra-partum eclampsia in active stage of labor i.e.,os>5cm dilated or ante-partum eclampsia with other medical condition e.g. heart disease, diabetes mellitus or chronic renal disease.

All women received magnesium sulphate as anticonvulsant as per Pritchard's regimen. If there was recurrence of convulsions, another 2g IV 20% MgSO4 is given IV. MgSO4 continued for 24 hours postpartum, with clinical monitoring and periodic assessment of knee jerk, respiratory rate and urine output. This was followed as per the department's Standard Operative Procedures.

Anti-hypertensive was given for, targeting BP between 140-160 mmHg and diastolic blood pressure between 90-110 mmHg.

IV labetalol was the drug of choice in severe hypertension and in irritable women.

Maternal and perinatal outcome was compared between the women undergoing early caesarean section and those planned for vaginal delivery by considering them as two separate groups.

OUTCOME MEASURES:

Maternal outcome measured in the form of mode of delivery, maternal complications and maternal mortality. Perinatal outcome measured in the form of birth weight, APGAR at 5 mins, perinatal complications, NICU admission and perinatal mortality.

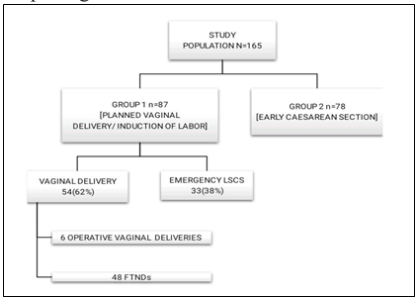
STATISTICALANALYSIS:

Statistical analysis was done by using SPSS (version 25) frequencies and percentages were calculated. Analysis of variance test and chi square tests were used for analysis; p value of <0.05 was considered to be significant.

RESULT:

The incidence of eclampsia in our study was 1.48%.

Figure 1: Depicting number of cases



A total of 165 cases were included in the study of which 87 underwent planned vaginal delivery and 78 underwent early caesarean section. Of those undergoing planned vaginal delivery 54 had a successful vaginal delivery, whereas 33 landed up with an emergency LSCS. (Figure1).

Table No.1: Comparison Of Baseline Maternal And Perinatal Characteristics. Both Groups Were Comparable For Baseline Characteristics.

Characteristic	Planned vaginal delivery (GroupI) (n=87)	Early caesarean section (Group-II) (n=78)	p value
Age in years			
≤19	13	12(15.39%)	0.508
20-25	64(73.56%)	52(66.67%)	
26-30	08(9.20%)	13(16.67%)	
>30	02(2.30%)	01(1.28%)	
Mean ± SD	22.04 ± 3.30		
Booking status			
Booked	39(44.83%)	38(48.72%)	0.854
Unbooked	48(55.17%)	40(51.28%)	
Gravida			
Primi	68(78.16%)	60(76.92%)	0.261
Multi	19(21.84%)	18(23.08%)	
Gestational age at time of admission			
≥32- 34 weeks	09(10.35%)	10(12.82%)	0.716
34.1- 37 weeks	34(39.08%)	31(39.74%)	
37.1- 40 weeks	39(44.83%)	36(46.15%)	
>40 weeks	5(5.74%)	01(1.28%)	
Number of convulsions			
≤ 5 convulsions	85(97.70%)	73(93.60%)	0.103
≥6 convulsions	2(2.30%)	05(6.40%)	
Convulsion to admission time			
<6 hours	67(77.0%)	66(84.62%)	0.603
6-12 hours	20(23.00%)	06(7.70%)	
≥ 12hours	0	06(7.70%)	
Consciousness level at the time of admission			
Alert	58(66.67%)	42(53.85%)	0.201
Irritable	29(33.33%)	36(46.15%)	
Systolic blood pressure			
> 160	08(9.20%)	19(24.36%)	0.645
160-140	27(31.03%)	27(34.62%)	
<140	52(59.73%)	32(41.02%)	
Diastolic blood pressure			
> 110	08(9.20%)	10(12.82%)	0.732
110-90	32(36.78%)	29(37.18%)	
< 90	47(54.02%)	39(50%)	
Bishop's score			
≤5	59(67.82%)	67(85.90%)	0.08
≥6	28(32.18%)	11(14.10%)	
Birth weight			
≤1.5	05(5.75%)	02(2.56%)	0.281
1.6-2.5	53(60.92%)	56(71.80%)	
> 2.5	29(33.33%)	20(25.64%)	

Table 1: Baseline characteristics were comparable in both groups.

A total of 165 women included in our study, majority 116 (70.30 %) of the study participants belonged to the age group of 20-25 years and mean age was found 22.04 and SD was 3.30. Majority of cases were unbooked i.e., 88(3.33%). The large majority i.e., 75(45.45%) of cases were between 37.1-40 weeks of gestation. Around 158(95.75%) of the cases reported with ≤5 convulsions. The mean Bishop's score in our study was 3.42± 0.86 in the group of women planned for vaginal delivery and 2.87± 0.25 in the group of women who underwent early caesarean section. Majority of the babies i.e., 109(66.06%) were born with a birth weight between 1.6-2.5kg. (Table 1)

Analysis in order to compare maternal complications between the two groups as shown in table 2 did not reveal any significant difference.

Table 2: Comparison Of Maternal Complications Between The Two Groups, No Significant Difference Was Found.

Complication	Planned Vaginal Delivery (87)	Early caesarean section (78)	p value
Pulmonary edema	01 (1.15%)	04 (5.13%)	0.190
AKI	01 (1.15%)	00	0.527
DIC	4(4.60%)	00	0.116
PRES	02(2.30%)	05 (6.41%)	0.257
Cerebrovascular accident	00	01(1.28%)	0.473
PPH	08(9.20%)	06(7.70%)	0.221
Abruptio placentae	03 (3.45%)	01(1.28%)	0.606

Of the 165 participants, 36 of them had at least one or more of the aforementioned maternal complications. The most common complication encountered in the study population was PPH in a total of 14 cases, 8 amongst those undergoing planned vaginal delivery and 6 amongst those who underwent early caesarean section. There was no maternal mortality in our study. On comparison of maternal complications between the two groups there was no statistically significant difference between them (Table2)

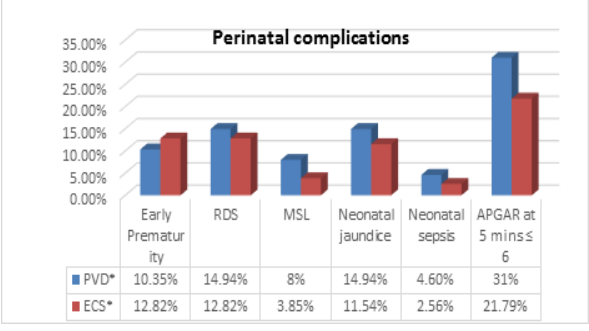


Figure 2: Comparison Of Perinatal Complications Between The Two Groups.

*[PVD- planned vaginal delivery, ECS- early caesarean section]

The most common perinatal complications were RDS and neonatal jaundice seen in 13.94% and 13.33% of the total babies respectively. On comparison of perinatal complications between the two study groups no statistically significant difference was found.

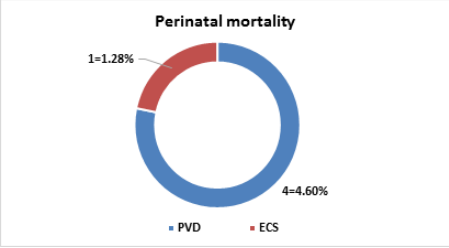


Figure 3: Percentage Of Perinatal Mortality In Each Group.

Perinatal mortality was lower i.e.,1.28%in the group undergoing early caesarean section whereas as it was 4.60% in the planned vaginal delivery group. However, this difference between the two groups was not found statistically significant as p>0.05.

SECONDARY ANALYSIS:

Perinatal morbidity and mortality showed a trend toward improvement in the early caesarean delivery group and the perinatal morbidity and mortality was higher in the planned vaginal delivery group, hence a further analysis was done to understand the determinants of perinatal complications in the two groups.

Table 3: Determinants of low APGAR

APGAR ≤6 (n=44)	Gestational age in weeks		Number of convulsions		BISHOP's Score		CTDI	
	<37 [n=83]	≥37 [n=71]	≤5 [n=158]	≥6 [n=07]	≤5 [n=125]	≥6 [n=40]	<12hrs [n=129]	≥12hrs [n=36]
Planned vaginal delivery (n=27)	17	10	25	2	25	02	13	14
Early caesarean section (n=17)	12	5	15	2	13	4	15	2
P value	P=0.02 S	P=0.14 NS	P=0.22 NS	P=0.35NS	P=0.01S	P=0.12 NS	P=16 NS	P=0.01 S

The determinants of a poor APGAR at 5 minutes of delivery are: a) Gestational age ,37 weeks at the time of delivery b) BISHOP's score ≤5 at the time of admission c) Convulsion to delivery interval ≥12hrs d) Mode of delivery i.e., planned vaginal delivery.(Table no 3)

Table 4: Determinants Of Neonatal Sepsis

Neonatal sepsis (n=6)	Gestational age in weeks		Number of convulsions		BISHOP's Score		CTDI	
	<37 [n=83]	≥37 [n=71]	≤5 [n=158]	≥6 [n=07]	≤5 [n=125]	≥6 [n=40]	<12hrs [n=129]	≥12hrs [n=36]
Planned vaginal delivery (n=4)	3	1	3	1	4	0	3	1
Early caesarean section (n=2)	1	1	0	2	0	2	1	1
P value	P=0.16 NS	P=0.93 NS	P=0.22 NS	P=0.35NS	P=0.05 S	P=0.13NS	P=16 NS	P=0.93 NS

When the perinatal complications were compared between babies born to mothers with unfavorable cervix and babies born to mothers with favorable cervix neonatal sepsis was seen in 4 babies in the women with unfavorable cervix and in 2 babies born to women with a favorable cervix. Further comparison by mode of delivery of babies born to mothers with an unfavorable BISHOP's suggested that neonatal sepsis was seen only in babies in the planned vaginal delivery group in women with an unfavorable BISHOP's score. When compared to the early caesarean group babies this difference was found to be statistically significant. (Table no 4)

Table 5: Determinants of meconium-stained liquor

Meconium-stained liquor (n=10)	Gestational age in weeks		Number of convulsions		BISHOP's Score		CTDI	
	<37 [n=83]	≥37 [n=71]	≤5 [n=158]	≥6 [n=07]	≤5 [n=125]	≥6 [n=40]	<12hrs [n=129]	≥12 hrs [n=36]
Planned vaginal delivery (n=7)	1	6	5	2	5	2	2	5
Early caesarean section (n=3)	2	1	0	3	2	1	2	1
P value	0.07 NS	0.86 NS	0.02 S	0.92 NS	0.27 NS	0.61 NS	0.16 NS	0.93 NS
			P=0.012 S					

Number of convulsions in mother at the time of birth was directly proportional to the meconium staining of liquor. Of the 7 mothers who had ≥6 prior to delivery, babies born to 5 of these women had meconium-stained liquor and this difference was found to be statistically significant.

It was observed that, as the number of convulsions increase prior to delivery the more are the chances of the baby passing meconium in utero. (Table no 5)

DISCUSSION:

The secondary analysis done in order to study the determinants of poor perinatal outcome divulged that most babies with a low APGAR were born to mothers whose gestational age was <37 weeks with an unfavorable BISHOP's, a convulsion to delivery interval ≥ 12 hours and undergoing a planned vaginal delivery. When compared to women who underwent early caesarean section with the same parameters, the difference was found to be statistically significant. It was observed that, women with an unfavorable BISHOP's when planned for vaginal delivery had higher rates of poor APGAR and neonatal sepsis in their babies and this difference was statistically significant when compared to early caesarean babies. Another significant observation was that, as the number of convulsions increase prior to delivery the more are the chances of the baby passing meconium in utero. The above observations necessitate the need for early caesarean deliveries in the aforementioned scenarios.

A randomized pilot study by Seal et al have concluded that a policy of early caesarean delivery in eclampsia carrying >34 weeks is not associated with better outcomes.[12] Sibai is of the opinion that if the gestational age is <30 weeks, caesarean delivery should be done, but if the gestational age is >30 weeks vaginal delivery is preferable.[13]Priti Kumari et al conducted study of 50 cases found that the corrected perinatal mortality was 50% and timely caesarean section reduces maternal and perinatal mortality and improves their outcome in antepartum eclampsia.[14]Behera NR et al conducted study of 200 cases was observed the caesarean section was having better maternal outcome than vaginal delivery.[15]Zulfeen M et al [2019], was found that the Group with favorable cervix achieved higher vaginal deliveries. Perinatal mortality and morbidity were significantly higher in patients with unfavorable cervix. However, there was no significant difference in maternal morbidity.[16]

The present study conducted involves a short span of 2 years and also a small study population hence has its limitations. A large scale RCT is required in order to derive conclusions that can be generalized for the management all cases of eclampsia.

CONCLUSION:

Early caesarean section to expedite delivery cannot be recommended for all cases of ante-partum eclampsia. In our study, the maternal outcome was seen to be comparable between both the groups, it is safe to say that prompt delivery by undertaking an early caesarean section does not have a benefit over vaginal delivery in improving maternal outcome. However, timely emergency caesarean section should be undertaken whenever indicated.

The perinatal outcome was better in the early caesarean delivery group as compared to the planned vaginal delivery group. Hence conducting an early caesarean section in antepartum eclampsia with

- gestational age between 32-37 weeks will help us deliver babies with promising APGAR score which will further help in achieving their developmental milestones in time.
- an unfavorable cervix and away from term will help to prevent neonatal sepsis and help us deliver babies with a good APGAR score at 5 minutes of delivery.
- ≥6 convulsions can help prevent perinatal asphyxia and meconium aspiration pneumonia which are doomed to occur in babies if kept for trial of labor.

Also, babies were born after 12 hours of first convulsion were seen to have a significantly lower APGAR, hence labor should not be prolonged beyond 12 hours of first convulsion and timely caesarean delivery can be undertaken to improve perinatal outcome.

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