ORIGINAL ARTICLE

INDUCTION TO DELIVERY INTERVAL AND ITS EFFECT ON FETOMATERNAL OUTCOMES IN ECLAMPSIA AND SEVERE PRE-ECLAMPSIA

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ABSTRACT

Objectives: To identify the fetomaternal complications in patients with Eclampsia and severe preeclampsia patients in association with induction to the delivery interval.

Material & Methods: This descriptive observational study was conducted From June to December 2019 in the department of obstetrics and Gynaecology at the Lady Reading Hospital, Peshawar, Pakistan. Antenatal patients with Eclampsia and pre-Eclampsia were included. IBM SPSS, Version 23.0 was used for data analysis, and tests were applied to find an association between induction to delivery interval and fetomaternal complications, chi-square test was applied and P -value < 0.05 was considered significant.

Results: The final cohort comprised 60 women with a mean age of 28.72±6.02. Most Maternal complications were 25% (n= 15) seen in more than 18hr duration from induction to delivery, deranged renal function was the most common maternal complicated ion 13% (n= 8), Pearson chi-square value of 0.01 shows a highly significant association between an increase in induction to delivery duration and maternal complications while stillbirth was most frequent fetal complication 13.3% (n= 8A). A P-value of 0.6 shows a non-significant association between induction to delivery duration and fetal complications

Conclusion: Our study concludes that with an increase in induction to delivery time, maternal and fetal complication increases.

Keywords: Eclampsia, Pre-eclampsia induction to delivery interval

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INTRODUCTION

Eclampsia is defined as convulsions in pregnancy not attributed to any other cerebral or metabolic condition, related to high blood pressure and proteinuria. Severe Pre-eclampsia usually precedes Eclampsia. Preeclampsia is a preeminent cause of maternal morbidity and mortality during pregnancy, complicating 5–9% of all pregnancies [1]. Preeclampsia and Eclampsia contribute to at least 16% of maternal mortality (63000 pregnant women annually) in developing countries. Thus, it ranks second only to hemorrhage as a specific, direct cause of death. In developing countries WHO estimates preeclampsia incidence to be seven-fold greater as compared to developed countries. I.e., 2.8% of live birth versus 0.4% in developed countries.[2,3] Maternal morbidity is more in these patients owing to its association with progressive maternal deterioration via pulmonary edema, renal and liver failure, abruption of the placenta, Stroke, multisystem failure, and HELLP (hemolysis, elevated liver enzyme, and low platelets. The exact etiology is still not known, a suggestive mechanism is an endothelial damage almost affecting all systems of the body [3], fetal complications usually arise from placental insufficiency leading to growth restriction, fetal distress, and stillbirth. [4]

The Working Group on High Blood Pressure in Gestation recommends that for women with Eclampsia, once the decision about delivery is finalized, labor initiation should be expedited.[5] we conducted this study to identify the maternal and fetal outcomes in eclamptic and severe preeclamptic patients related to the start of induction to the delivery interval. The results of this study will provide us with local statistics and help develop local protocols regarding timing and mode of delivery and this will open a window for further research.

MATERIAL AND METHODS

This descriptive observational study was conducted From June to December 2019 in the department of Obstetrics and Gynaecology at the Lady Reading Hospital, Peshawar, Pakistan. Written informed consent and

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ethical approval from the hospital committee were taken. Pre-designed forms were used to record demographic details and the gestational age of the patients. Antenatal woman with a singleton pregnancy, gestational age more than 28 weeks, unfavorable bishop score (≤6), with severe pre-eclampsia (BP ≥160/110) plus one or more of the following symptoms i.e., severe headache, visual disturbance, epigastric pain, nausea vomiting, or patients with Eclampsia were included in the study. while women with intrauterine fetal demise, intrauterine growth restriction, placental abruption on admission, chronic hypertension, chronic renal disease, connective tissue disease, and gestational hypertension were not included.

We defined Induction as the use of a cervical ripening agent (prostaglandin E2, Misoprostol, or Foleys catheter) in presence of a < 6 bishop score. Induction to the delivery interval was noted from the start of induction till the delivery of the baby. Prolonged labor was defined as ≥ 24 hours from the start of induction to delivery.

Following Maternal outcomes were noted. Renal dysfunction was categorized as deranged renal function (urea, creatinine, uric acid results higher than the normally accepted range with urine output > 30ml/ hour and renal failure (anuria or oliguria < 30ml/ hour with urea, creatinine > two times of baseline in 48 hours. Other outcomes were HELLP syndrome, pulmonary edema, stroke, and disseminated intravascular coagulopathy (DIC).

Fetal outcomes were stillbirth, NICU admission, early neonatal death, and significant meconium. For sample size calculation, Openepi software was used, according to which sample size was 60 (taking the prevalence of pre-eclampsia and eclampsia as 5 to 6% with a 95% confidence interval).

IBM SPSS Statistics for Windows, Version 23.0 (IBM Corp., Armonk, NY) was used for data analysis. Categorical variables were reported as frequencies and percentages, while continuous variables were reported as mean and standard deviation. The Chi-square test and Pearson's correlation test were applied with the level of significance set at P- value < 0.05.

RESULTS

A cohort of 60 women with an age range from 16 to 43 years and a mean age of 28.72±6.02 were included in the study. The majority were multigravida 45% (n=27), with 46.7 % (n=28) having a gestational age of 33 -36 weeks. Prostaglandin E2 was used as a method of induction in 51.7 % (n=31) Table 1.

Maternal complication started to increase after 12 hours from induction to delivery duration, a proof k 25% (n= 15) was seen in more than 18hr duration from induction to delivery, and deranged renal failure was the most common maternal complication at 13% (n= 8), (Table 2) Pearson chi-square value of 0.01 shows a highly significant association between an increase in induction to delivery duration and maternal complications while stillbirth was most frequent fetal complication 13.3% (n= 8) (Table 3). Pearson Chi-square value of 0.6 shows a non-significant association between induction to delivery duration and fetal complications there were 3.3% (n=2) maternal death.

Table 1: Basic demographic features

Obstetrical History	Primigravida	33.3% (n=20)
	Multigravida	45% (n=27)
	Grand Multigravida	21.7 % (n= 13)
Period of gestation	29 - 32 Weeks	23.3% (n=14)
	33 - 36 Weeks	46.7 %(n=28)
	37 - 40 Weeks	23.3% (n=14)
	> 40 weeks	6.7% (n=4)
Mode of delivery	Normal vaginal delivery	55.0 % (n= 33)
	Instrumental Delivery	21.7% (n=13)
	Caesarean Section for failed Induction	18.3% (n=11)
	Direct Caesarean Section	5 % (n=3)
Methods of induction	Misoprostol	27.7 % (n=16)
	Prostaglandin E2	51.7 % (n= 31)
	Foley's Catheter	21.7 % (n= 13)
	< 1.5	10.0 % (n =6)
	1.6 – 2.5	33.3 % (n= 20)
	2.6- 3.5 kg	56.7 % (n= 34)

Table 2: Induction to Delivery Interval * Maternal Complications Crosstabulation

		Maternal Complications								Total
Induction to Delivery Interval		no complication	Maternal Mortality	Renal Failure	Help Syndrome	Pulmonary Oedema	DIC	deranged RFTS	stroke	
	1 - 6 Hours	1	0	0	0	0	1	0	0	2
	12 -7 Hours	8	0	1	1	0	0	0	0	10
	12 - 18 Hours	13	2	1	1	0	1	2	0	20
	18 - 24 Hours	7	0	1	0	0	0	5	2	15
	> 24 Hours	7	0	0	2	3	0	1	0	13
Total		36	2	3	4	3	2	8	2	60

Table 3: fetal Complications * Induction to Delivery Interval Crosstabulation

		Induction to Delivery Interval					Total
		6 - 1 Hours	12 -7 Hours	18 - 12 Hours	24 - 18 Hours	> 24 Hours	
fetal Complications	alive and healthy	1	8	12	10	5	36
	Still Birth	0	1	2	2	3	8
	ENND	0	0	2	0	2	4
	NICU admission	0	0	3	1	2	6
	significant meconium	1	1	1	2	1	6
Total		2	10	20	15	13	60

DISCUSSION

Eclampsia and Preeclampsia are one of the leading causes of maternal morbidity and mortality [6], timely and efficient management of various aspects like early recognition, management of fit, controlling blood pressure and planning delivery can have a positive impact on adverse fetomaternal outcomes, one of the important factor is fit to the delivery interval. In this study increase in maternal complications was observed as an induction to the delivery interval increased by more than 12 hours with a peak at 18 hours. Renal function was most frequently affected in mothers while stillbirth was the most common complication in fetuses. Eclampsia and severe-eclampsia-related complications increase with an increase in duration from diagnosis of the condition and starting induction to the delivery interval. These complications are more in this part of the world possibly due to poor antenatal care facilities, delays in seeking medical treatment, lack of awareness, early pregnancies, and inadequate healthcare facilities. [7]

A major part of our study's population i.e., 33 (55%) patients was in the 21-30 age group, similar to the findings reported in the study done by Mahalaxmi et al. [8] and Aparna Khan et al. [9] Patients between 21 and 30 years of age form 76.34% of the population as per the NER data. In this study, the frequent maternal complication was deranged renal function and HELLP syndrome 13.3% & 4% respectively, the incidence of acute kidney injury (evident in form of deranged renal function) with these two conditions is reported as between 7-60% in multiple studies, and it's found to be the most frequent complication, in index study 3.3 % of patients were affected by stroke. A relevant study concluded an 80% increased risk of stroke in patients with preeclampsia compared to women with uncomplicated pregnancy. [9-13]

Regarding fetal complications in this study, 13.3% of stillbirths occurred in eclamptic patients, with 10% of neonates admitted to the NICU. The probable reasons behind perinatal mortality were delayed arrival of patients in the hospital after the onset of seizure resulting in severe intrauterine hypoxia of the fetus and intrauterine death, and shortage of adequate facilities in the nursery can also be a contributory factor. Higher perinatal deaths were reported in the studies done by Swain et al.[14] During this study there were 3.3 % maternal deaths, one had HELLP syndrome, and the other was admitted with Stroke and multiorgan failure. There was a delay in seeking medical care, both had no antenatal checkups and had multiple fits at home. A related study in India reported maternal mortality of 6%, which is quite similar to ours regarding poor healthcare system.[15] By comparing the fetal and maternal complications with induction to delivery time, as the time increases the rate of complication increases, and the association was statistically significant. Our finding was also supported by Levind et al. [16] who suggest

that with an increase in delivery time maternal morbidity as well as mortality increases. Eclampsia and pre-eclampsia are serious entities in the pregnant population and their management and complication management add a great financial burden to the already compromised healthcare system. Awareness should be created for early recognition and timely referral of these patients to the health care facility, where a multidisciplinary team can manage these patients. We recommend further research on this topic, as one of the limitations of this study was a small sample size, and lack of data on long-term complications associated with this condition.

CONCLUSION

Delivery should be expedited in a proper healthcare facility to decrease the frequency of maternal and fetal complications related to Eclampsia and pre-eclampsia The maternal and fetal complications increase with the increase in induction to delivery time.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Raees M: Study conception, Literature search, Data Entry. Write up, Critical review

Hussain SS: Study conception, Literature search, Data analysis, Critical review

Qazi G: Literature search, data entry

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.