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RESEARCH PAPER.

COMPARISON OF LABOUR OUTCOME AND NEONATAL OUTCOME IN SRI LANKAN MOTHERS WITH TERM PRE-LABOUR RUPTURE OF MEMBRANES FOLLOWING IMMEDIATE INDUCTION OF LABOUR WITH PROSTAGLANDIN E2 AND EXPECTANT MANAGEMENT FOR 24 HOURS

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ABSTRACT

The time duration between membrane rupture and the onset of labour is known as the latent period. The maternal and neonatal outcome in term Pre-lebour Rupture of Membranes (PROM) is greatly important to minimize maternal and fetal morbidity and mortality, for the better management and prevention of complications. Analytical cross-sectional study was conducted at the University Obstetrics Unit, Teaching Hospital Anuradhapura. Term pregnant mothers, with POG of 37 weeks and above, who present with pre-labour rupture of membranes, were considered as study population. 120 Pregnant women who are not in active labour were included for the study. All selected participants were observed until their discharge with the baby and necessary details were recorded. Age of the study participants were ranged from 18 years to 40 years (Mean=29.1 yrs: SD=5.3 yrs). Highest representation was observed in age 21-30 yrs group. Period of Amenorrhea of the study participants were ranged from 38 weeks to 40 weeks of gestation. Mean gestation of age was 39 weeks 5 days (SD=0.723 weeks). Majority of participants were belonged to 39+ weeks of gestation (n=97:80.8 %). Occurrence of perineal tear during vaginal delivery was significantly associated with usage of prostaglandin E2 to augment delivery. Only one person who was treated with Co-amoxiclav had fever. Association of Normal vaginal delivery with treatment with prostaglandin was 0.365. Association of Prostaglandin E_2 induction with birth asphyxia and SCBU admission were described in Table 4. APGAR score less than 7 during five minutes following delivery was significantly associated with induction from Prostaglandin E_2. Majority of babies who admitted to SCBU during post natal period were induced by Prostaglandin E_2. Successful outcomes can be achieved by concluding the labour process as early as possible after PROM. The use of prostaglandins to induce labour after PROM is a practical and effective option. The use of prostaglandins is associated with a significant risk of birth asphyxia and perineal laceration. However, it is recognized that the possibilities to overcome the clinical morbidities caused by them are widely available.

Key Words: PROM, Prostaglandin, Child birth, Perinatal

INTRODUCTION

Pre-labour Rupture of Membranes (PROM) is defined as breaking of amniotic membranes before the onset of labour which results in leaking of amniotic fluids. This definition has been subcategorized into term PROM when the gestational age is 37 weeks or more, Preterm PROM when the gestational age is between 24 -37 weeks and into Pre-viable PROM when the gestational age is less than 24 weeks.

Nearly 10% of term pregnancies are complicated with PROM[1]. Patients with PROM may complain of fluid leakage from vagina, vaginal discharge and vaginal bleeding without significant uterine contractions. It is vital to recognize PROM correctly as it is associated with cord accidents, intrauterine infections, sepsis and neonatal complications. The most useful and practical diagnostic test of rupture of membranes is observation of amniotic fluid passing through cervical os and pooling of amniotic fluid in the posterior vaginal fornix. The time duration between membrane rupture and the onset of labour is known as the latent period. This time duration may vary depending on the immediate induction and expectant management[2].

In Sri Lankan setting, according to the national guidelines, pre-labour rupture of membranes at term can be managed either with immediate induction of labour or with conservative management for approximately for 24 hours with close monitoring of maternal and fetal well being followed by induction of labour. Evidence of previous studies carried out on this topic suggests that the rupture of the membranes is associated with several factors. They are ascending infections, programmed cell death of fetal membranes and collagen destruction[6, 7, 8]. It is said to be that the complication risk of PROM is greater if the woman has low body mass index, previous history of PROM and the longer time duration between the rupture of membranes and the delivery [9].The maternal and neonatal outcome in term PROM is greatly important to minimize maternal and fetal morbidity and mortality, for the better management and prevention of complications. This study aims to decide on maternal and neonatal outcome of women presenting with term PROM managed with immediate induction with prostaglandin E2 and conservative management for 24 hours.

METHODOLOGY

Analytical cross sectional study was conducted at the University Obstetrics Unit, Teaching Hospital Anuradhapura which is the main draining tertiary care hospital in the district. In the hospital, about 700 deliveries are taking place during a month. The study setting includes the Antenatal ward, Labour ward, Post-natal ward, Obstetric theatre and Special Care Baby Unit. Term pregnant mothers, with POG of 37 weeks and above, who present with pre-labour rupture of membranes, were included in the study as the participants. Open invitation was offered to mothers on recruitment to the study. None probability convenient sampling technique was applied for recruit the study participants. Participant recruitment was done

by the House officer who examine the patient when admission. Term pregnant mothers, with POG of 37 weeks and above, who present with pre-labour rupture of membranes, were included in the study as the participants. These pregnant women were observed by the principal investigator until delivery. All clinical conditions related to them were recorded. But at no time was the principal investigator involved in the examination of patients or the process of deciding treatment. Consultant in charge of the unit as well as the other health care staff except principal investigator involved in management of the patient. This information collection process was continued until the mother and child were discharged from the hospital. Data was retrieved into an electronic database once gathered into the data collection forms by the investigator.

RESULTS

Study was conducted among 120 pregnant women with pre-labour rupture of membranes, who presented to Obstetrics unit of Teaching Hospital Anuradhapura.

Table 1: Distribution of age and the period of gestation of the study participants

Age Category	Frequency (n)	Percentage (%)
< 20 years	11	9.2
21-30 years	59	49.2
>31 Yrs	50	41.7
Total	**120**	**100.0**

Age of the study participants were ranged from 18 years to 40 years (Mean=29.1 yrs: SD=5.3 yrs). Highest representation was observed in age 21-30 yrs group.

Table 2: Distribution of period of gestation of the study participants

Gestational age	Frequency (n)	Percentage (%)
37 weeks +	7	5.8
38 weeks+	16	13.3
39 weeks+	97	80.8
Total	**120**	**100.0**

Period of Amenorrhea of the study participants were ranged from 38 weeks to 40 weeks of gestation. Mean gestation of age was 39 weeks 5 days (SD=0.723 weeks). Majority of participants were belonging to 39+ weeks of gestation (n=97:80.8 %).

Table 3 : Associations of prostaglandin intervention and variables related to labour

Variable	Prostaglandin E_2		OR	95% CI
	Yes	No		
Mode of delivery				
NVD	46	54	0.365	0.13-1.02
LSCS	14	6		
Maternal Pyrexia				
Yes	1	3	0.32	0.03-3.18
No	59	57		
Perineal tear				
Yes	41	16	5.9	2.7-13.1
No	19	44		
Total	**60**	**60**		

Occurrence of perineal tare during vaginal delivery was significantly associated with usage of prostaglandin E2 to augment delivery. Only one person who were treated with Co-amoxiclav had fever. Association of Normal vaginal delivery with treatment with prostaglandin was 0.365.

Table 4: Associations of prostaglandin intervention and perinatal complications

Variable	Prostaglandin E 2		OR	95% CI
APGAR Score	**Yes**	**No**		
<7	14	1	17.95	2.27-141.6
>8	46	59		
SCBU Admission				
Yes No	3	1	3.1	0.31-30.73
	57	59		
Total	**60**	**60**		

Association of Prostaglandin E_2 induction with birth asphyxia and SCBU admission were described in Table 4. APGAR score less than 7 during first five minutes following delivery was significantly associated with induction from Prostaglandin E_2. Majority of babies who admitted to SCBU during post natal period were induced by Prostaglandin E_2.

Discussion

The study findings indicate a significant association between the administration of Prostaglandin E_2 (PGE_2) for labour augmentation and the occurrence of perineal tears during vaginal delivery. Additionally, the association between normal vaginal delivery and PGE_2 treatment was reported as 0.365. However, the specific meaning of this value is unclear without additional context, such as whether it represents a correlation coefficient, odds ratio, or another statistical measure.

Existing literature presents mixed results regarding the relationship between PGE_2 use and perineal trauma. Some studies have reported an increased risk of perineal tears associated with labour induction agents, including PGE_2, due to factors like intensified uterine contractions leading to rapid fetal descent and insufficient perineal stretching. Conversely, other research has found no significant increase in perineal trauma with PGE_2 use, suggesting that outcomes may vary based on clinical practices and patient populations. Regarding maternal fever, the observation that only one patient treated with co-amoxiclav (an antibiotic) experienced fever aligns with existing data indicating a low incidence of fever associated with antibiotic prophylaxis during labor. However, without more detailed information, it is challenging to draw definitive conclusions about this association.

While the current study suggests a significant association between PGE_2 administration and perineal tears, the existing literature presents varied findings. Further research, particularly large-scale randomized controlled trials, is necessary to elucidate the relationship between PGE_2 use and perineal trauma during vaginal delivery. Risk of maternal and fetal complications. One of the most severe consequences is asphyxia, where the baby experiences oxygen deprivation, potentially leading to severe neurological impairment or even fetal demise. This condition can occur due to umbilical cord compression, placental insufficiency, or intrauterine infections, which are more likely when the protective amniotic sac ruptures prematurely.

To prevent such adverse outcomes, continuous monitoring of fetal heart rate and maternal well-being is of paramount importance. Fetal heart rate variability serves as a crucial indicator of fetal distress, and any abnormalities, such as bradycardia or tachycardia, may suggest underlying complications like fetal hypoxia. In addition, maternal vital signs, uterine contractions, and signs of infection must be closely monitored to ensure both maternal and fetal safety. Certain risk factors significantly increase the likelihood of maternal and neonatal morbidity and mortality in PROM cases. When PROM occurs before 37 weeks of gestation, there is a higher risk of neonatal complications, such as respiratory distress syndrome (RDS), sepsis, intraventricular hemorrhage, and necrotizing enterocolitis. If an intrauterine infection is suspected, early delivery is often the most appropriate course of action to prevent sepsis in both the mother and baby. Any sign of fetal compromise necessitates immediate intervention to prevent birth asphyxia and neurological damage. Conditions such as

placental abruption, severe preeclampsia, or umbilical cord prolapse require urgent delivery to prevent life-threatening complications.

This study, conducted in a specific maternity unit in Sri Lanka, faced limitations in generalizability due to the homogeneity of the population and the use of convenience sampling. The relatively low incidence of Pre-labour Rupture of Membranes (PROM) restricted the ability to use randomized sampling, introducing potential selection bias. Additionally, treatment decisions regarding prostaglandin administration were made independently by the attending specialist, which may have led to information and intervention selection biases. The study primarily served as hypothesis-generating rather than establishing causal relationships, as the small sample size limited the scope for extensive statistical analysis. Practical constraints, such as time and financial limitations, further restricted the study's statistical power and external validity. Future research with larger, multi-center cohorts, randomized sampling methods, and standardized treatment protocols is recommended to enhance the reliability, applicability, and robustness of findings on PROM management.

Conclusion

Successful outcomes can be achieved by concluding the labour process as early as possible after PROM. The use of prostaglandins to induce labor after PROM is a practical and effective option. The use of prostaglandins is associated with a significant risk of birth asphyxia and perineal laceration. However, it is recognized that the possibilities to overcome the clinical morbidities caused by them are widely available. Attention should be paid to establishing procedures in obstetric units to diagnose PROM and complete the labour process as soon as possible. When PROM is diagnosed, Prostaglandin E_2 can be used more effectively to induce labour. Full attention should be paid to preventing complications and obstetric morbidities that may occur when induced with Prostaglandin E_2. Efforts should be made to minimize perinatal morbidities by establishing facilities to manage the effects of complications and morbidities.

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