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Study on maternal and fetal outcomes in term prelabour rupture of membranes in a tertiary care teaching institute

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Abstract

Objectives and Methods: A retrospective study was conducted to investigate the maternal and fetal outcomes in term PROM by analysing the medical records of 246 patients, from February 2020 to July 2020. Data was entered in excel and analysed by SPSS version 21.0. Descriptive statistics was used for categorical variables.

Results: Incidence of term PROM was 14% and it is common in primi gravida (54.9%), age group of 22 – 25 years (42%). 73.6% of cases had induction followed by acceleration and 26.4% went for spontaneous labour. The time of delivery from PROM was 10% in <12 hours, 59% in 12 -24 hours and 31% in >24 hours. Vaginal delivery in 50.81% of cases and 49.19% by LSCS. Among the maternal co-morbidities, Pregnancy Induced Hypertension 6.1%, anemia 2.8% and Rhesus Negative 2.4%. 18.7% of neonates needed NICU care.

Conclusion: PROM is associated with higher rate of induction and LSCS. Timely intervention will reduce the maternal and fetal morbidity and mortality.

Keywords: Prelabour rupture of membranes, induction, LSCS, NICU care

Introduction

Prelabour rupture of membrane (PROM), previously known as premature rupture of membranes. PROM refers to the disruption of fetal membranes before the onset of labour resulting in spontaneous leakage of amniotic fluid [1]. It is one of the common problems encountered in day to day obstetric practice and subdivided into term, preterm and mid trimester PROM. PROM that occurs before and after 37 weeks of gestation is defined as preterm and term PROM, respectively. It occurs in approximately 5-10% of all pregnancies, of which about 80% occurs at term [2].

Risk factors associated with PROM include low socioeconomic status, low body mass index, tobacco use, PROM or preterm labour in previous pregnancy, infections such as urinary tract infection, sexually transmitted diseases, chorioamnionitis, vaginal bleeding at any time in pregnancy, cervical insufficiency, Polyhydramnios, multiple gestations and invasive procedures like amniocentesis [3]. In addition to above mentioned factors; membrane dysfunction at molecular level, collagen destruction and programmed cell death in fetal membranes also contribute to PROM. Early rupture of membranes may jeopardise the pregnancy contributing to significant maternal and perinatal morbidity and mortality.

Maternal complications associated with PROM are chorioamnionitis, endomyometritis, placental abruption, dysfunctional labour, increased caesarean rate, post operative wound infection, pelvic abscess, septicaemia and postpartum haemorrhage [4, 5]. Perinatal morbidity is due to respiratory distress syndrome, hypothermia, hypoglycaemia, necrotising enterocolitis, periventricular leucomalacia, intraventricular haemorrhage, bronchopulmonary dysplasia, meconium aspiration syndrome, neonatal sepsis, umbilical cord prolapse. Three common causes for fetal death associated with PROM are sepsis, asphyxia and pulmonary hyperplasia. Early Onset Neonatal Infection (EONI) is often acquired prenatally in pregnancies with PROM and is associated with increased neonatal morbidity and mortality [3].

Term prelabour rupture of membrane is managed either by spontaneous onset of labour or immediate induction of labour. Delaying the labour increases the risk to mother and baby while

induction of labour provides its own challenges like failed induction, fetal distress and increased rate of caesarean section [6]. Increased caesarean section rate is associated with its own complications and wound infections thereby increasing the duration of stay in the hospital and expenditures [3].

Early identification of risk factors and management of term PROM are highly warranted to avoid maternal and fetal morbidity and mortality. Hence the present study is conducted to analyze the maternal and fetal outcome of term Prelabour rupture of membrane in tertiary care teaching hospital.

Methodology

This is a retrospective, non comparative observational study and it was conducted in the department Obstetrics and Gynaecology at tertiary care teaching institute. This study was approved by the institutional ethical committee and adhered to the principles of the Declaration of Helsinki. The case records of 300 women admitted as PROM, from February 2020 to July 2020 were collected from the medical record department. Out of which, 246 cases of term PROM were included in this study as per the inclusion criteria and the remaining 64 were excluded as per the exclusion criteria. The outcome variables noted for the mother

were the age, obstetric score, time of rupture of membranes to time of delivery, colour of liquor and co-morbidities of the mother and for neonates include mode of delivery, birth weight, sex of the baby, APGAR score and NICU admission.

Inclusion criteria

Singleton pregnancy more than 37 weeks of gestation
Cervical dilatation less than 3 cm

Exclusion criteria

Multiple pregnancies
PPROM
Patient in active labour

Statistical analysis

The Data were entered in excel spread sheet and checked for correction. The statistical analysis was performed with SPSS version 21.0 software. Descriptive statistics were used for categorical variables and P value of less than 0.05 was taken as statistically significant association.

Result

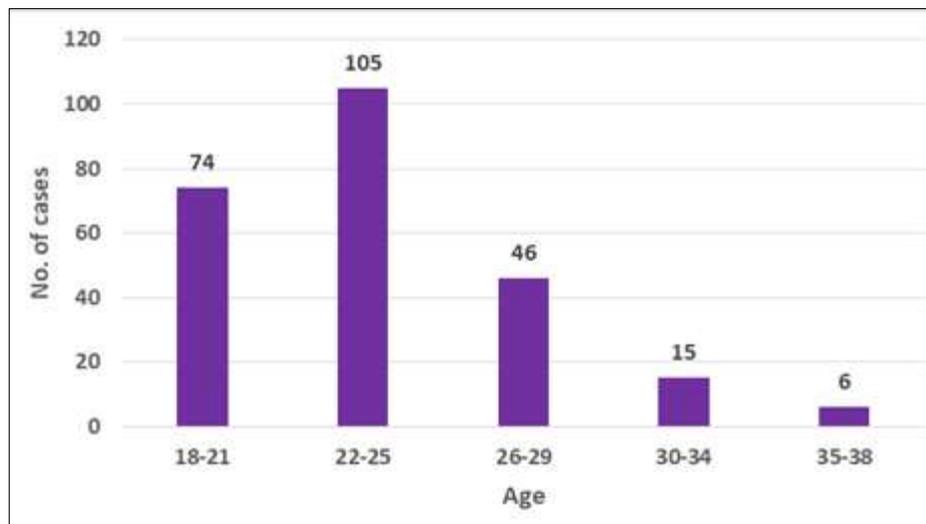


Fig 1: Age distribution of patients

The age group in this study varies from 18-38 years and the most common age group was 22-25 years (105 cases) 42.68% followed by 18-21 years 30.08% and 26-29years 18.69%. Minimum age in this study is 18 years and maximum is 38 years.

Table 1: Obstetric score

Obstetric score	Frequency	Percentage
G1	135	54.9%
G2	62	25.2%
G3	35	14.3%
G4	11	4.5%
G5	2	0.8%
G6	1	0.4%

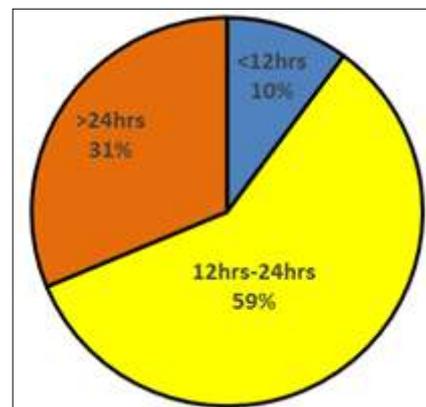


Fig 2: Time of rupture of membrane to the time of delivery

Time of rupture of membrane to the time of delivery varies between 6 hours to more than 24 hours with the maximum of 59% occurred between 12-24 hours followed by 31% occurred later than 24 hours and the least at less than 12 hours (10%).

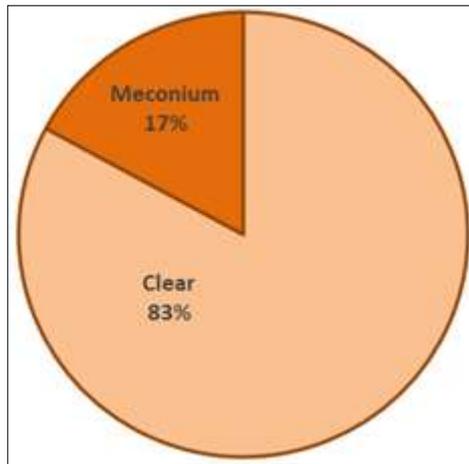


Fig 3: Colour of Liquor

In this study, majority of the term PROM patients had clear liquor (83%).

Table 2: Mode of delivery

Mode of Delivery		Frequency	Percentile
Spontaneous	Vaginal	59	23.98%
	LSCS	6	2.44%
Induced	Vaginal	66	26.83%
	LSCS	115	46.75%
Total		246	100%

In this study, 125 mothers (50.81%) had vaginal deliveries and 121 (49.19%) delivered via LSCS in both spontaneous and induced labour.

Table 3: Indications for LSCS

Indication	Frequency	Percentage
Oligohydramnios	27	22.31%
Fetal distress	31	25.61%
Cephalopelvic disproportion	18	14.87%
Failed induction	16	13.22%
Previous LSCS	15	12.39%
Non progression of labour	12	9.91%
Breech	2	1.65%

In this study, the most common indication for LSCS was fetal distress (25.61%) followed by oligohydramnios (22.31%) and the least was for breech (1.65%). The other indications for LSCS were CPD, failed induction, previous LSCS and non progression of labour.

Table 4: Maternal co-morbidities

Co-morbidities	Frequency	Percentage
Anemia	7	2.8%
Bad Obstetrics History (BOH)	3	1.2%
Gestational Diabetes	2	0.8%
Hypothyroid	3	1.2%
Pregnancy Induced Hypertension (PIH)	15	6.1%
Obesity	3	1.2%
Rhesus Negative (RH -ve)	6	2.4%
TOTAL	39	15.85%

Out of 246 term PROM mothers, 39 (15.85%) had co-morbidities in which PIH was the most common and Gestational diabetes was found to be rare.

Table 5: Maternal morbidity in PROM

Morbidity	Frequency	Percentage
Wound infection	17	6.91%
PPH	3	1.22%
Fever	19	7.72%
Total	39	15.85%

Fever, wound infection and PPH were the common maternal morbidity in order of frequency following term PROM.

Table 6: Weight of Baby

Weight of Baby	Frequency	Percentage
<2.5kgs	77	32%
≥2.5kgs	168	68%

Table 7: APGAR score of baby

Apgar score at 5 minutes	Frequency	Percentage
5/10	1	0.4%
6/10	1	0.4%
7/10	18	7.3%
8/10	226	91.9%

Table 8: Neonatal morbidity

Morbidity	Frequency	Percentage
Respiratory distress syndrome	17	6.9%
Transient tachypnea of newborn	7	2.8%
Meconium aspiration syndrome	5	2%
low birth weight	4	1.6%
Sepsis	3	1.2%
Neonatal hyperbilirubinemia	1	0.4%
Other causes	12	4.8%

Out of 246 births, 200 (81.3%) newborns were healthy and 46 (18.7%) neonates were admitted in Neonatal Intensive Care Unit (NICU). The common reasons for NICU admission were respiratory distress syndrome (6.9%), TTN (2.8%), meconium aspiration syndrome (2%), low birth weight (1.6%) and other causes (4.8%).

Obstetric score plays an important role in outcome of delivery. In this study, a strong association was observed between Obstetric score and Mode of Delivery with their p-value less than 0.05 and chi-square value of 278.15. Similarly, Obstetric score and maternal co-morbidities had an association with strongly significant chi-square value of 186.51 and p-value < 0.001.

Discussion

Prelabour rupture of membranes is one of the common complications of pregnancy which leads to increased maternal complications, surgical procedures, maternal and fetal morbidity and mortality^[7]. In the present retrospective study, the incidence of term PROM was 14% which is slightly higher than the previously reported incidence of 5-10 % of all pregnancies^[8]. This higher incidence of PROM was mainly due to referral patients from primary health centres, taluk and district level hospitals. In this study majority of the cases 105 (42%) belong to 22-25years, 74 (30%) cases were in the age group of 18-21 years which is similar to the study done by Vlora ademi Ibishi *et al* where 65% of cases were in the age group 20 to 29 years^[4].

This study also shows that term PROM is more common in primigravida (54.9%) which is slightly lower than that of the previous study conducted by Tigist Endale *et al* on maternal and fetal outcome in term PROM, were term PROM in primigravida was 69% [1].

Duration of PROM and latency were significantly associated with unfavourable maternal and fetal outcome. In less than 12 hours from time of rupture of membranes, 10% of mothers delivered, within 12 hours - 24 hours 59% delivered and 31% delivered after 24 hours. Out of this, 17% of them presented with meconium stained liquor.

Out of the 246 cases, majority of them (73.6%) required Induction followed by acceleration and the remaining went in for spontaneous labour which is similar to the study done by Amulya MN *et al* [7, 10]. Statistically no difference in the mode of delivery i.e 50.81% delivered vaginally and 49.19% delivered by LSCS, according to our study. The common indications for LSCS were oligohydramnios and fetal distress. The other indications for LSCS include failed induction, non progressive labour and previous LSCS. The higher incidence of LSCS was related to the high rates of induction and maternal co-morbidities. The commonly associated maternal co-morbidities were Pregnancy Induced Hypertension, Rhesus Negative and anemia in order of frequency.

Post operative wound infection was present in 6.91% of patients leading to prolonged stay in the hospital which is higher than the study done by Sailaja *et al* which showed only 2.5% of post operative wound infection [9]. The fetal outcome in this study includes 32% of low birth weight; this may be associated with maternal co-morbidities such as PIH, anemia and BOH. Most of the neonates (91.9%) had a 5 min APGAR of 8/10 while 18.7% needed NICU admission. The neonatal mortality in this study was 0.4% which is comparatively lower than the previous study done by Shruti Gupta *et al* that showed 2% neonatal mortality [6] and Arpita. A *et al* that showed perinatal mortality rate of 1.43% [11].

Conclusion

The term prelabour rupture of membranes remains as one of the challenging situation to be tackled by practicing obstetricians and an important cause for maternal and fetal morbidity with increased rate of caesarean section delivery. LSCS increases the long term morbidity for the mother and increased hospital costs. Majority of the term PROM, occurs in primigravida between 18 to 25years of age. Apart from early diagnosis and prompt management of term PROM, it is highly essential to educate the antenatal mother regarding regular and timely antenatal check up for the better maternal and fetal outcome.

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