

PERINATAL OUTCOME IN PREMATURE RUPTURE OF MEMBRANES (PROM) AND PRE-PROM (PPROM)

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ABSTRACT

OBJECTIVES

This study aimed to evaluate the maternal and fetal outcomes in PROM and PRE-PROM at tertiary care hospitals.

METHODOLOGY

This Cross-sectional study was carried out in the department of obstetrics and gynaecology at Khyber Teaching Hospital Peshawar after ethical approval of the institutional ethical board. Patients who fulfilled the inclusion criteria were selected. On arrival, detailed history was taken, physical and obstetrical examination and per speculum examination were done, patients were managed conservatively, and steroid cover was given for fetal lung maturity.

RESULTS

A total of 150 pregnant women who met the inclusion criteria and were complicated by PROM or PRE-PROM were followed. Out of the total patients, 104 presented with PROM, while 46 presented with PPROM. PROM and PPROM patients were identical regarding placental abruption. 104(69.3%) patients presented with PROM and PPROM 46(30.7%). Patients who delivered were 72(52%) normal vaginal delivery (NVD), 57(38%) C-Section, 15(10%) NVD with episiotomy. In NVD 54(63%) spontaneous, 18(12%) induced, while in C-Section 6(4%) elective and 51(34%) emergency C-Section. In PROM, 18(12%) were complicated by chorioamnionitis, fetal distress meconium stained liquor 18(12%), whereas 100 were uneventful, while in PPROM, 122(81.3%) had no complications, 10(6.7%) chorioamnionitis and 40.7% of the neonates had NICU admission. The personal effects of NVD on the duration of PROM/ PRE-PROM in days with p-value 0.027. The p-value of Complications of PRE-PROM was 0.037.

CONCLUSION

PROM and PPROM presented with increased maternal and fetal morbidity, vaginal infection, and urinary tract infection should be promptly screened and treated on time to prevent maternal morbidities and improve fetal outcomes.

KEYWORDS: PROM, Chorioamnionitis, Neonatal, Apgar Score, Cesarean

INTRODUCTION

Pre-labour membrane rupture is a disorder with high maternal morbidity, and newborns are at risk for both morbidity and mortality in terms of low Apgarscore and neonatal respiratory distress syndrome. Pre-labour rupture of the membranes describes membranes that have already ruptured before the start of regular uterine contractions. PROM of between 24 and 37 completed weeks is referred to as PPROM.¹ The administration of corticosteroids has improved the preterm birth result in PPROM.^{2,3,4} Although the cause is unknown, the subclinical infection has been suggested as a possible cause.⁵ In addition to being linked to 30-40% of premature births, 2-4% of singleton and 7-20% of twin pregnancies are complicated by the PPROM.^{6,7} Premature membrane rupture accounts for 2-20% of delivery complications

and 18-20% of neonatal mortality.⁸ Numerous neonatal problems, such as fetal mortality, neonatal infection, and respiratory distress syndrome, are all linked to PPROM. Infection is the most frequent maternal consequence of PPROM. Infection after delivery or endometritis affects 2% to 13% of moms and causes chorioamnionitis in 13% to 60% of pregnant women.⁹ Chorioamnionitis, which causes endometritis, puerperal pyrexia, and wound infection, are an example of maternal morbidities. Additional morbidities include more caesarean sections and instrumental deliveries due to fetal distress, maternal pyrexia, sepsis or coordinated uterine activity.^{10,11} In order to prevent maternal complications and fetal mortality, pre-labour membrane rupture is the most common cause of morbidity and requires prompt diagnosis and treatment. This study aimed to know the maternal and fetal outcomes in PROM and PRE-

PROM at tertiary care hospitals.

METHODOLOGY

This cross-sectional study was conducted in the Department of Obstetrics and Gynecology at Khyber Teaching Hospital from October 15th 2021-April 15th, 2022, with a consecutive non-probability sampling technique, after ethical approval of the institutional ethical board. A patient who fulfilled the inclusion criteria was selected, on arrival detailed history physical examination, obstetrical and per speculum examination was done, baseline investigations were sent, managed conservatively, and steroid cover was given for fetal lung maturity. Inclusion criteria: patients with a pregnancy of more than 24 weeks history of per vaginal leak were included in this study, while patients with a known case of placenta previa, previously more than one cesarean section, known case of chorioamnionitis, preeclampsia and eclampsia were excluded from this study. Biodata like age, gravida, parity, period of gestation, duration of per vaginal leak, mode of delivery, maternal complications, fetal complications, neonatal ICU admission and neonatal Apgar score were filled in proforma. Percentages and frequency were calculated, and the p-value was calculated using a multiple linear regression test.

RESULT

Among 150 patients, the mean and standard deviation of the gestation period in weeks were 36.153 ± 4.83 , the Duration of PROM/PPROM in days was 2.78 ± 2.32 , and the baby's weight in Kg was 3.059 ± 2.89 , respectively.

Table 1: Descriptive Statistics of the Demographic Variables

	F	%age
Neonatal NICU Admission		
Yes	61	40.7
None	89	59.3
Normal vaginal delivery		
Term	12	8.0
Spontaneous	54	36.0
Indication of induction	02	1.3
Preterm	06	4.0
Induced	18	12.0
Cesarean Section		
Elective	06	4.0
Emergency	51	34.0
Neonatal Apgar Score		
8/10, 10/10	101	67.3
4/10, 10/10	10	6.7
6/10, 10/10	30	20.0
2/10, 2/10	03	2.0
0/10, 0/10	06	4.0

Table 1: Continue

Complications of PROM and PPRM		
None	122	81.3
Chorioamnionitis	10	6.7
PPH	09	6.0
Placental Abruption	06	4.0
PROM	104	69.3
PPROM	46	30

Table 2: Regression Analysis of the PROM vs Pre-PROM

Model	R	R Square	Adjusted R Square	Std.error of the Estimate	P-Value
01	0.43 ^F	0.186	0.134	2.16362	0.001

The table shows that the value of $R^2 = 0.186$. This means that 18.6% of the variation in the predicted variable (Y) was described by regressors included in our model (PROM Versus PRE-PROM, mode of delivery, weight of the baby in Kg, complications of PROM, Nursery Admission, NVD, Fetal Outcome in terms of Apgar Score, Complications of PRE-PROM, Cesarean Section Indication) and the rest of the variation is due to other factors.

Table 2(a): ANOVA

Model	Sum of Squares	df	Mean Square	F	P-Value
Regression	149.833	09	16.648	3.556	0.001
Residual	655.375	140	04.681		

Table express that the significant p-value=.001, which is less than 0.05. Consequently, the hypothesis of no effect is rejected. In addition, it is decided that there is an enormously statistically significant effect of regressors (PROM Versus PRE-PROM, mode of delivery, weight of baby in Kg, complications of PROM, Nursery Admission, NVD, Fetal Outcome in terms of Apgar Score, Complications of PRE-PROM, Cesarean Section Indication) on the duration of PROM/ PRE-PROM in days.

The individual effects of each regressor on the dependent variable (Y), the effect of NVD (X_1) on the duration of PROM/ PRE-PROM in days was p-value 0.027, which was significant. As a result, the NVD (X_1) significantly affected the duration of PROM/ PRE-PROM in days. The p-value for the regressor Complications of PRE-PROM (X_2) is more significant than 0.05, i.e., $0.037 > 0.05$. These findings deduced that one unit increase in NVD may lead to a .335 increase in the average duration of PROM/ PRE-PROM in days. If there were one unit increase in Complications of PRE-PROM, then there would be a -.454 time decrease in the duration of PROM/ PRE-PROM in days. If the coefficient of all the regressors included in the model was equal to zero, and there was no effect of the regressors on the duration of PROM/ PRE-PROM in days, then the duration of PROM/ PRE-PROM in days would stand at 1.577.

Table 2 (b): Estimated Parameters

Model	Unstandardized Coefficients		Standardized Coefficients	T	P-Value
	B	Std. Error	Beta		
(Constant)	1.577	1.367		01.154	0.251
Mode of Delivery	0.352	0.301	0.101	01.171	0.244
NVD	0.335	0.150	0.239	02.232	0.027
Cesarean Section Indication	-0.237	0.291	-0.097	-0.815	0.417
Complications of PROM	-0.204	0.123	-0.150	-01.658	0.100
Complications of PRE-PROM	-0.454	0.215	-0.219	-02.109	0.037
Fetal outcome in terms of Apgar Score	0.406	0.208	0.193	01.951	0.053
Weight of baby in Kg	0.028	0.062	0.035	0.453	0.651
Nursery Admission	-0.227	0.393	-0.048	-0.578	0.564
PROM Versus PRE-PROM	0.640	0.514	0.127	1.245	0.215

The estimated model is given below

$$Y = 1.577 + 0.335(\text{NVD}) - 0.454(\text{Complications of PRE-PROM})$$

Where

Y denoted duration of PROM/ PRE-PROM in days

X₁ represents NVD

X₂ represents Complications of PRE-PROM

DISCUSSION

The most frequent symptom was fetal distress in patients who presented with PROM and PPROM. In this study, the rate of neonatal mortality was 8%. The maternal morbidity rate was 22%, and 28% of newborns were morbid.¹² In contrast, in our study, 57 (38%) C/Sections, 6 (4%) elective C/Sections, and 51 (34%) emergency C/Sections were performed. Maternal complications included chorioamnionitis, which affected 16% of women, cord prolapse, which affected 6% of women, and placental abruption, which affected 12% of women (1.3%). According to a survey, 49.3% of deliveries in Nigeria were emergency caesareans, compared to 37 vaginal deliveries (50.7%). Birth weight 2500g (P = 0.006), Apgar score 7 at 5 minutes (P = 0.008), and no APH (P = 0.007).¹³ Contrarily, in our study, 57 (38%) C/Sections, 6 (4%) elective C/Sections, 51 (34%) emergency C/Sections, and 72 (52%) NVD were carried out, and the neonate was delivered with a significant p-value (p=.053). In a study reported in Dhaka, in primary gravida, premature rupture of membranes, or PROM, was a common occurrence (62.7%). Term PROM was higher (70.92%) than PPROM (29.09%), patient delivery via the vaginal route was higher (70.91%), and LSCS was lower (29.09%). Higher maternal morbidity (27.8%) was present in the PROM, including Wound infection (4.5%), chorioamnionitis (11.8%), and postpartum fever (3.6%). Additionally, there were increased rates of birth asphyxia (4.5%), respiratory distress syndrome (9.09%), morbidity (26.4%), and septicemia. All occur during pregnancy (5.8%).¹⁴

Contrarily, in our study, 57 (38%) C/Sections, 6 (4%) elective C/Sections, and 51 (34%) emergency C/Sections, as well as 72 (52%) NVD, were carried out. Considering the complications of PROM, 100 (66%) had none, chorioamnionitis (18%), fetal distress meconium-stained liquor (18%), PPH (6%), cord prolapse (4%), and placental abruption (1.3%) (p=0.100), whereas, in PPROM, 122 (81.3%) had none, 10 (6.7%) chorioamnionitis, fetal distress meconium-stained liquor (18%). According to the study conducted in India, 34–36 weeks of gestation are typical for PPROM primary gravida. The vaginal delivery rate was 66.7%, while the caesarean delivery rate was 31.7% among the patients. UTI was one of the more common maternal morbidities (13%). 40.7% of newborns were admitted to the NICU, 50.7% had RDS, and 20.9% had septicemia.¹⁵ However, in our study, 57 (38%) C/Sections, 6 (4%) elective C/Sections, 51 (34%) emergency C/Sections, 72 (52%) NVD, considering fetal distress meconium stained fluid, 18 (12%), the fetal outcome in terms of Apgar score (p=0.053), and nursery admissions (p=0.564) were all done. Cesarean sections were more strongly related to PPROM than PROM in a study published in Russia (P 0.05). Comparing the PPROM group to the PROM group showed that the rate of admission to the neonatal intensive care unit (NICU) was significantly greater.¹⁶ Contrarily, in our study, 57 (38%) C/Sections, 6 (4%) elective C/Sections, and 51 (34%) emergency C/Sections were carried out. They considered fetal outcome in terms of Apgar score (p=0.053) and nursery admittances (p=0.564), as well as fetal distress (meconium-stained liquor 18 (12%). In a study reported in Karimnagar Rao Medical Science, the prevalence of PPROM was 7.8%. Intra-amniotic infection was observed in 32%. The average incubation period from membrane rupture to delivery is 3.78 + 2.74 days—Twenty-five per cent of deliveries by caesarean section. There were 12% perinatal mortality, stillbirth-4% and 10%-early neonatal mortality.^{17,18} In contrast, our study describes

fetal outcomes in terms of fetal distress meconium staining CSF 18 (12%), Apgar score ($p = 0.053$) and NICU admission ($p = 0.564$). Patients presenting with pregnancy more than 24 weeks with a history or active per vaginal leak should be admitted, detailed obstetrics and per vaginal speculum examination to be performed should be observed for signs of chorioamnionitis and promptly treated with antibiotics cover and steroids coverage to prevent maternal endometritis and fetal respiratory distress syndrome.

LIMITATIONS

The sample size is limited as it is a single-centred study, and most of the patients after discharge from our unit were not properly followed neither the patients presented to us again for follow up and usually, the patients presented with the main complaints of per vaginal leak but on clinical examination they had only discharge not leak.

CONCLUSION

Patients presenting with PROM and PPROM have high maternal morbidity in terms of maternal pyrexia, chorioamnionitis, induction of labour and Cesarean Section and fetal distress with a low Apgar Score.

CONFLICT OF INTEREST: None

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