



## Prevalance of PPRM and its Outcome

Kamlesh<sup>1</sup>, Kushla Pathania<sup>2</sup>, Anoop Sharma<sup>3</sup>, Varsha Sapehia<sup>4\*</sup>

<sup>1</sup>Department of Obstetrics and Gynecology, Kamla Nehru hospital Shimla, Himachal Pradesh, India.

Email: kamleshchaudhary909@gmail.com, Orcid ID: 0000-0002-7287-9777

<sup>2</sup>Department of Obstetrics and Gynecology, Kamla Nehru hospital Shimla, Himachal Pradesh, India.

Email: dr.kushla@gmail.com Orcid ID: 0000-0002-1560-3731

<sup>3</sup>Department of Obstetrics and Gynecology, Kamla Nehru hospital Shimla, Himachal Pradesh, India.

Email: dranoop2012@gmail.com Orcid ID: 0000-0001-5291-4312

<sup>4</sup>Department of Anesthesia, PGIMER Chandigarh, India.

Email: varshasapehia@gmail.com Orcid ID: 0000-0002-4845-4576

\*Corresponding author

Received: 25 April 2021

Revised: 13 August 2021

Accepted: 25 August 2021

Published: 22 October 2021

### Abstract

**Background:** Prematurity is the leading cause of perinatal morbidity and mortality in developed as well as in underdeveloped countries. Premature rupture of membranes is associated in one third of the patients with preterm labour. The present prospective observational study was conducted to determine the prevalence of preterm premature rupture of membrane (PPROM) and its association with the demographic risk factors and its neonatal outcome. **Methods:** There were 9000 deliveries from July 2018 to June 2019 in the department of Obstetrics and Gynecology, Kamla Nehru state Hospital for mother and child, Shimla. Detail history and examination along with the demographic risk factors were recorded on a performa. Every patient was followed till her delivery and the mode of delivery and foetal outcome was recorded. **Results:** Out of these, 113 patients were confirmed to have PPRM at 26-34 weeks. The overall rate of PPRM was 2.9% (260/9000), of which 43.4% (113/260) occurred at  $\leq 34$  weeks. It was seen to be common among patients between 20-30 years (58.8%), with upper lower class socioeconomic status (40.7%). Risk of PPRM was seen to be highest among patients giving birth to their first child (53.9%), with gestational age between 32-34 weeks (54.9 cases). 18.5% cases there was history of urinary tract infection (UTI), 17.6% history of hypothyroidism, while in 12.3% cases, there were one, two, or more previous preterm deliveries and 10.6% cases there was history of anemia. 73.4% patients went into spontaneous labour and 26.5% were induced. Normal vaginal delivery occurred in (75.2%), and caesarean section rate was 24.8%. Twenty-five neonates had no complications. More than one complication present in one neonate. The most common neonatal complication was Respiratory distress syndrome in 48 (31.8%) neonates followed by neonatal jaundice 31 (20.6%). Mean birth weight was  $1.58 \pm 0.3313$  kg and 77% babies required neonatal intensive care. Perinatal mortality rate was (18.6%) of total births. **Conclusions:** PPRM is an important cause of preterm birth, resulting in large number of babies with low birth weight, requiring neonatal intensive care.

**Keywords:-** Preterm premature rupture of membrane, PPRM, preterm birth.

## INTRODUCTION

Preterm premature rupture of membranes is one of the leading identifiable causes of prematurity. Rupture of membranes before 37

weeks of pregnancy can result in preterm birth in about 30% of cases. It complicates about 3% of all pregnancies.<sup>[1]</sup> The normal development, structural integrity and function of fetal membranes are essential for the normal

progress and outcome of pregnancy. One of the most important function of the membranes is to remain intact until the onset of labour at term in order to maintain the protective intrauterine fluid environment; the amniotic fluid upon which foetus depends for its survival in utero. Membrane rupture can occur for variety of reasons. At term, membrane rupture can result from a normal physiologic weakening of the membranes combined with shearing forces created by uterine contractions. During Preterm gestation, rupture of membranes can result from a wide array of pathological mechanisms that act individually or in concert.<sup>[2,3]</sup>

A previous history of PPRM is a major risk factor for preterm PROM or preterm labour in a subsequent pregnancy. Other risk factors include short cervical length, second and third trimester bleeding, low socioeconomic status, BMI, cigarette smoking, and illicit drug use.<sup>[4]</sup> In Women with preterm PROM, clinically evident intra-amniotic infection occurs in approximately 15-25% and Postpartum infections in 15-20%. Abruptio placenta complicates 2-5% of pregnancies with PPRM.<sup>[5]</sup>

Management after confirmation of diagnosis of PROM is dependent primarily on gestational age. Patient with PROM before 34 weeks of gestation should be managed expectantly if no maternal and fetal contraindications exist. Non reassuring fetal status, clinical chorioamnionitis and significant abruptio placentae are clear indications for delivery. Otherwise, gestational age is a primary factor when considering delivery versus expectant management.<sup>[6]</sup>

We determined the prevalence of PPRM and its association with the demographic risk factors and neonatal outcome.

## MATERIAL AND METHODS

We conducted a prospective observational study of women with singleton pregnancies who presented with rupture of membranes. A total of 113 women presenting with PPRM from 26-34 weeks with rupture of membrane were included in this study. Patients with congenital anomalies, multiple pregnancy, pre-eclampsia, eclampsia, diabetes mellitus, polyhydramnios, intrauterine growth restriction, placental abruption along with those who presented with preterm premature rupture of membranes at term were excluded.

After taking consent, detailed history and examination was performed. Demographic and obstetrical data was recorded on a performa. Preterm premature rupture of membranes were confirmed if on sterile speculum examination, there was amniotic fluid seen draining through the cervical os along with reduced amniotic fluid index on ultrasound. In equivocal cases nitrazine test was performed for confirmation.

All patients with PPRM were admitted in the maternity ward. They were either put on conservative management if no sign of infection was present or active management was done if any sign of infection was present. Women was put on expectant management, corticosteroids and antibiotics were administered. Dexamethasone 6mg, 4 doses, 12 hours apart was administered. Informed consent of the women taken explaining the risks and benefits of expectant management. A 7 days course of antibiotic therapy with a combination of intravenous ampicillin 2g every 6 hourly for 48 hours followed by oral amoxicillin 250 mg every 8 hourly or oral erythromycin 333mg initially every 6 hourly for 48 hours and then after every 8 hourly was administered during

expectant management . The criteria for maternal infection was temperature >38 C with one or more of the following signs, uterine tenderness, foetal or maternal tachycardia or foul smelling amniotic fluid draining per vaginam in the absence of any obvious reason for elevated temperature.

Subjects were followed till their delivery and postnatally and data regarding mode of delivery, foetal weight, APGAR score and neonatal outcome was recorded on the performa. Main outcome measures were prevalence of preterm premature rupture of membranes 26- 34 weeks. Its association with maternal demographic and obstetrical variables along with mode of delivery, low birth weight perinatal morbidity and mortality.

## RESULTS

### General characteristics

A total of 9000 deliveries occurred from june 2018 to july 2019. Total number of patients with PPRM were 113 at 26-34 weeks. The overall rate of PPRM was 2.9% (270/9000), of which 43.4% (113/260) occurred at ≤ 34 weeks . Table-1 shows number of PPRM with mothers' age, gestational age, socio demographic. Majority of patients were young with age ≤30 years, with gestational age between 32-34 weeks (54.9

cases) and between 28 to 32 weeks (47 cases, 41.6%). PPRM was frequent among patients belonging to upper lower socioeconomic class (40.7%). Risk of PPRM was seen to be highest among patients giving birth to their first child (53.9%). 73.4% patients went into spontaneous labour and 26.5% were induced. Normal vaginal delivery occurred in (75.2%), and caesarean section rate was 24.8%.

### Cervical examination

Pelvic examination had been performed in 55 patients (48.7%) before reporting to the hospital while in 58 (51.3%) patients, no previous pelvic examination was performed [Figure 1].

### Neonatal and perinatal outcome

[Table 2] Shows the neonatal and perinatal outcome of the babies. 53 (46%) babies of extremely low birth and 55 (48.7%) babies of very low birth weight. 23 (20.3%) babies were born with low APGAR score and required neonatal intensive care. 21 babies had neonatal mortality, resulting in perinatal mortality 18.6%.

### Postnatal maternal and foetal morbidity

31.01 of babies developed fever and required injectable antibiotics while 19 (16.81%) of mothers required injectable antibiotics [Table 3].

**Table 1:** General characteristics

	Frequency	Percentages
Age-group (years)		
<20	5	4.4%
20-30	87	76.9%
>30	21	18.6%
Parity		
Primi	61	53.9%
Multi	52	46.1%
Period of gestation (weeks)		



≤28	4	3.5%
28.1 - 32	47	41.6%
>32-34	62	54.9%
Socioeconomic status		
I	2	1.8%
II	19	16.8%
III	35	31%
IV	46	40.7%
V	11	9.7%
Onset of labor		
Spontaneous labour	83	73.4%
Induction of labour	30	26.5%
Mode of delivery		
NVD	85	75.2%
Caesarean section	28	24.8%

NVD, Normal vaginal delivery

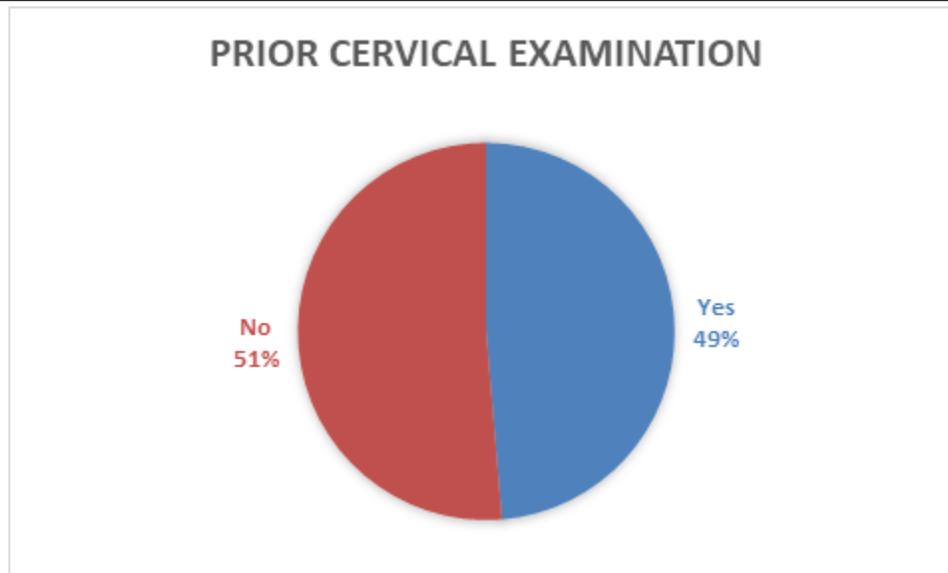
**Table 2:** Perinatal and neonatal outcome.

	Frequency	Percentages
APGAR score		
<7	23	20.3%
≥7	90	79.6%
Birth weight (kg)		
1-1.5	53	46.0%
1.6-2	55	48.7%
>2	6	5.3%
NICU admission		
No	26	23.0%
Yes	87	77.0%
Outcome		
Alive	92	81.4%
Expired	21	18.6%

NICU, Neonatal intensive care unit

**Table 3:** Postnatal maternal and foetal morbidity

	Frequency	Percentages
Maternal infection		
Yes	19	16.81%
No	94	83.1%
Fetal infection		
Yes	40	35.3%
No	73	64.6%



**Figure 1:** Prior cervical examination

## DISCUSSION

The prevalence of PPRM in this study is 2.9% which is similar to other studies. Lack of education, poverty, living at high altitude, poor nutritional status of women in this area, and improper utilization of available health resources may be the causes of this. Nutritional deficiencies that predisposes women to abnormal collagen structure have also been associated with an increased risk of preterm premature rupture of membranes.<sup>[4]</sup> In addition, no screening programme is being carried out in the area to detect and treat women suffering from genitourinary tract infections during pregnancy.

Demographic variables associated with PPRM were lower maternal age, null parity, low socioeconomic class which are similar to those reported in other studies.<sup>[1,2,6,7]</sup> In the present study 53.9% of the cases were primigravida which is similar to that reported in the study from by Seema Singhal et al 60% were primigravida.<sup>[8,9]</sup> Shweta patil et al,<sup>[7]</sup> also noted

that 53% were primigravida. This might be due to the registration of greater number of primigravida in study which was due to apprehension in first pregnancy and because of increasing awareness of better healthcare facilities.

Caesarean section rate in this study was 24.8% which is similar to that reported in the study from Woranart Ratanakorn et al and Priscilla Frenette et al also.<sup>[6,8]</sup> In our study, 12.3% cases had previous preterm deliveries. This incidence is similar to reported by Tahir et al (14.7%).<sup>[7]</sup> In the present study, neonates with Apgar score <7 were 79.6% and 20.3% with Apgar score more than 7. Similar findings were reported by Seema Singhal et al and Shehla Noor et al.<sup>[1,9]</sup> In the present study, 81.4% neonates were alive and 18.6% expired.<sup>[10]</sup> This was comparable with Shweta Anant Mohokar et al, Seema Singhal et al and Shehla Noor et al studies.<sup>[1,2,9]</sup> In this study 35.3% of babies and 16.47% of mothers developed infection despite the administration of antibiotics. This was because of sepsis, as KNH Shimla being tertiary institute, get

referrals from different centers and by the time patient reaches KNH they have had multiple PV examinations. In the study by Ananth prophylactic antibiotic use was associated with reduced perinatal morbidity, neonatal sepsis, endometritis and chorioamnionitis.<sup>[10,11]</sup>

## CONCLUSIONS

PPROM is one of the important causes of preterm birth that can result in high perinatal

morbidity and mortality along with maternal morbidity. Looking after a premature infant puts immense burden on the economic and health care resources of the country; therefore risk scoring strategies involving the demographic variables along with previous history of preterm deliveries should be developed to identify high risk cases and treating them prior to rupture of membranes.

## REFERENCES

1. Noor S, Nazar AF, Bashir R, Sultana R. Prevalance of PPRM and its outcome. *J Ayub Med Coll Abbottabad*. 2007;19(4):14-7.
2. Mohokar SA, Bava AK, Nandanwar YS. Analysis of maternal and perinatal outcome in cases of preterm premature rupture of membranes. *Bombay Hospital J*. 2015; 57(3): 285.
3. ACOG Committee on Practice Bulletins-Obstetrics. ACOG Practice Bulletin No. 80: premature rupture of membranes. Clinical management guidelines for obstetrician-gynecologists. *Obstet Gynecol*. 2007;109(4):1007-19. doi: 10.1097/01.AOG.0000263888.69178.1f.
4. Parry S, Strauss JF 3rd. Premature rupture of the fetal membranes. *N Engl J Med*. 1998;338(10):663-70. doi: 10.1056/NEJM199803053381006.
5. Signore A. About inflammation and infection. *EJNMMI Res*. 2013;3(1):8. doi:10.1186/2191-219X-3-8
6. Ratanakorn W, Srijariya W, Chamnanvanakij S, Saengaroon P. Incidence of neonatal infection in newborn infants with a maternal history of premature rupture of membranes (PROM) for 18 hours or longer by using Phramongkutklao Hospital Clinical Practice Guideline (CPG). *J Med Assoc Thai*. 2005;88(7):973-8.
7. Endale T, Fentahun N, Gemada D, Hussen MA. Maternal and fetal outcomes in term premature rupture of membrane. *World J Emerg Med*. 2016;7(2):147-152. doi:10.5847/wjem.j.1920-8642.2016.02.011
8. Frenette P, Dodds L, Armson BA, Jangaard K. Preterm Prelabor Rupture of Membranes: Effect of Latency on Neonatal and Maternal Outcomes. *J Obstet Gynaecol Can*. 2013;35(8):710-717.
9. Singhal S, Puri M, Gami N. An Analysis of Factors Affecting the Duration of Latency period and its impact on Neonatal Outcome in patient with PPRM. *Int J Infertility Fetal Med*. 2012;3(3):87-91.
10. Walker MW, Picklesimer AH, Clark RH, Spitzer AR, Garite TJ. Impact of duration of rupture of membranes on outcomes of premature infants. *J Perinatol*. 2014;34(9):669-72. doi: 10.1038/jp.2014.73.
11. Tahir S, Aleem M, Aziz R. Incidence And outcome of Preterm premature rupture of membranes. *Pak J Med Sci*. 2002;18(1): 26-32.

Source of Support: Nil, Conflict of Interest: None declared