

Original Article

## INCIDENCE AND OUTCOME OF PRETERM-PREMATURE RUPTURE OF MEMBRANES

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### ABSTRACT:

**Objective:** To know the incidence and to evaluate the outcome of cases of preterm premature rupture of membranes (PPROM).

**Design:** An observational study done over a period of 1 year between 31st January 1999 to 31st January 2000.

**Setting:** 136 cases of PPRM admitted in the antenatal ward of Obstetric and Gynecology Unit II, Punjab Medical College, Divisional Head Quarter (DHQ) Hospital, Faisalabad.

**Main Outcome Measures:** Incidence, latency period, perinatal mortality & morbidity & maternal morbidity.

**Results:** Incidence of Pre-term premature rupture of membrane was 5.4%. Most of the patients were below 25 years or above 30 years of age (74%, 66% respectively). Majority belonged to low socio-economic group. Thirty-two patients had previous history of abortion or preterm delivery, seventy-eight patients delivered within first 48 hours. About 2.6% percent patients developed choriomnionitis. Eighty six percent patients delivered vaginally. Perinatal mortality was 19%. Retained placenta & abruption was seen in 0.7% cases each.

**Conclusions:** PPRM is a major obstetric problem. Expectant management upto 36 weeks is a favourable option in our circumstances where neonatal intensive care units (N.I.C.U.) are not available. Prolongation of pregnancy to achieve fetal maturity can be possible by adopting strict clinical criteria thereby decreasing prematurity.

**KEYWORDS:** PPRM, Expectant management, maternal morbidity, perinatal mortality.

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## INTRODUCTION

Pre maturity and its consequences are very important health problem as it is the most common cause of neonatal morbidity and mortality even in advanced world with neonatal care facility. One third of preterm deliveries are complicated by preterm premature rupture of membranes (PPROM). It is seen in 1-2% of pregnancies but contributes to 20% of perinatal deaths.

PPROM is defined as rupture of amniotic membranes a few hours before the onset of uterine contractions after the age of viability, before 37 completed weeks. Latency period is the time that elapses between rupture of membranes and onset of labour.

Obstetric approaches to the management of PPRM are many and still controversial in our

setting. There is always a risk of sepsis with expectant management. Intranatal pneumonia choriomnionitis, lung hypoplasia are major risks. Balancing the risk of infection against hazards of pre maturity is a complex process<sup>1,2,3,4</sup>. Some clinicians opt for expectant or conservative management upto 36 weeks in PPRM in the absence of immediate indication of delivery<sup>5</sup>. In developed countries with modern Neonatal Intensive Care Unit (N.I.C.U.) intentional delivery is opted after inducing lung maturity with steroids<sup>6,7,8,9</sup>, but due to increased morbidity, the cost of delivery and postnatal care of these very premature babies is high and neurological deficits in the neonate remain a big risk. These very premature babies may require ventilatory support and parenteral nutrition for quite sometime till their own systems can take over.

The present study was conducted to see the incidence of PPRM and outcome after expectant management in terms of maternal morbidity, perinatal morbidity and mortality.

### PATIENTS AND METHOD

In the present study pregnant women presenting in antenatal ward between 28 to 36 weeks with complaints suggestive of PPRM were included. Diagnosis of PPRM was established by history, sterile speculum pelvic examination showing amniotic fluid trickling from cervix, pad test and ultrasonography (U.S.G.) and in equivocal cases by using nitrazine swab test. Ultrasonography was done in each case for gestational age, growth parameters, presentation, exclusion of congenital anomalies and to assess the liquor columns for amniotic index.

Conservative management was done till the time spontaneous labour started or the maternal or fetal indication for delivery developed such as choriomnionitis, meconium stained amniotic fluid, intrauterine death (I.U.D.) or lethal congenital anomalies and advanced labour on admission. Patients were hospitalized until delivery & women were advised best rest. Two doses of betamethasone 12 mg 1/M 12 hours apart were given to the mother to enhance fetal

lung maturity in case of fetal normalcy. Prophylactic antibiotics were used in all cases for ten days or upto delivery (whichever came first) to reduce the risk of infection. Maternal monitoring to detect evidence of choriomnionitis was done by six hourly pulse temperature record, abdominal tenderness, colour and smell of liquor and record of fetal heart rate and cardiography (C.T.G.). High vaginal swabs were sent to study the vaginal flora and likely source of infection.

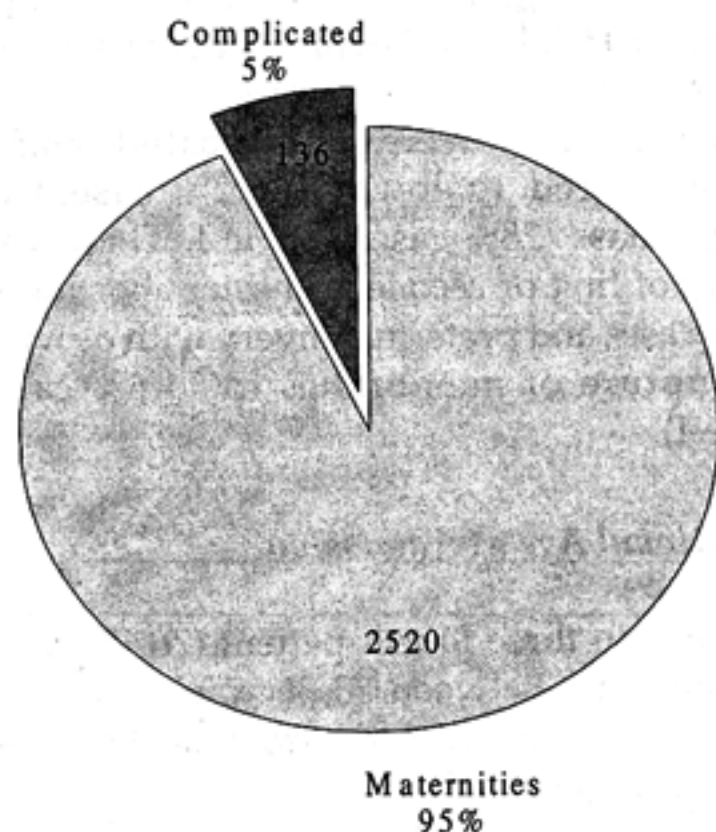
Clinical choriomnionitis was indication for delivery which included increased temperature of at least 100.4 °F or more, abdominal tenderness, foul smelling liquor, maternal & fetal tachycardia. All patients with choriomnionitis received intravenous broad-spectrum antibiotics during labour. Antibiotics were given to the baby after delivery in such cases. Neonates with poor apgar score or infection were admitted in Paediatric Ward for further management.

### RESULTS

*Incidence:* During the study period of one year 2520 pregnant women were delivered. Of these 136 were complicated by PPRM giving an incidence of about 5.4% in this hospital Figure-1.

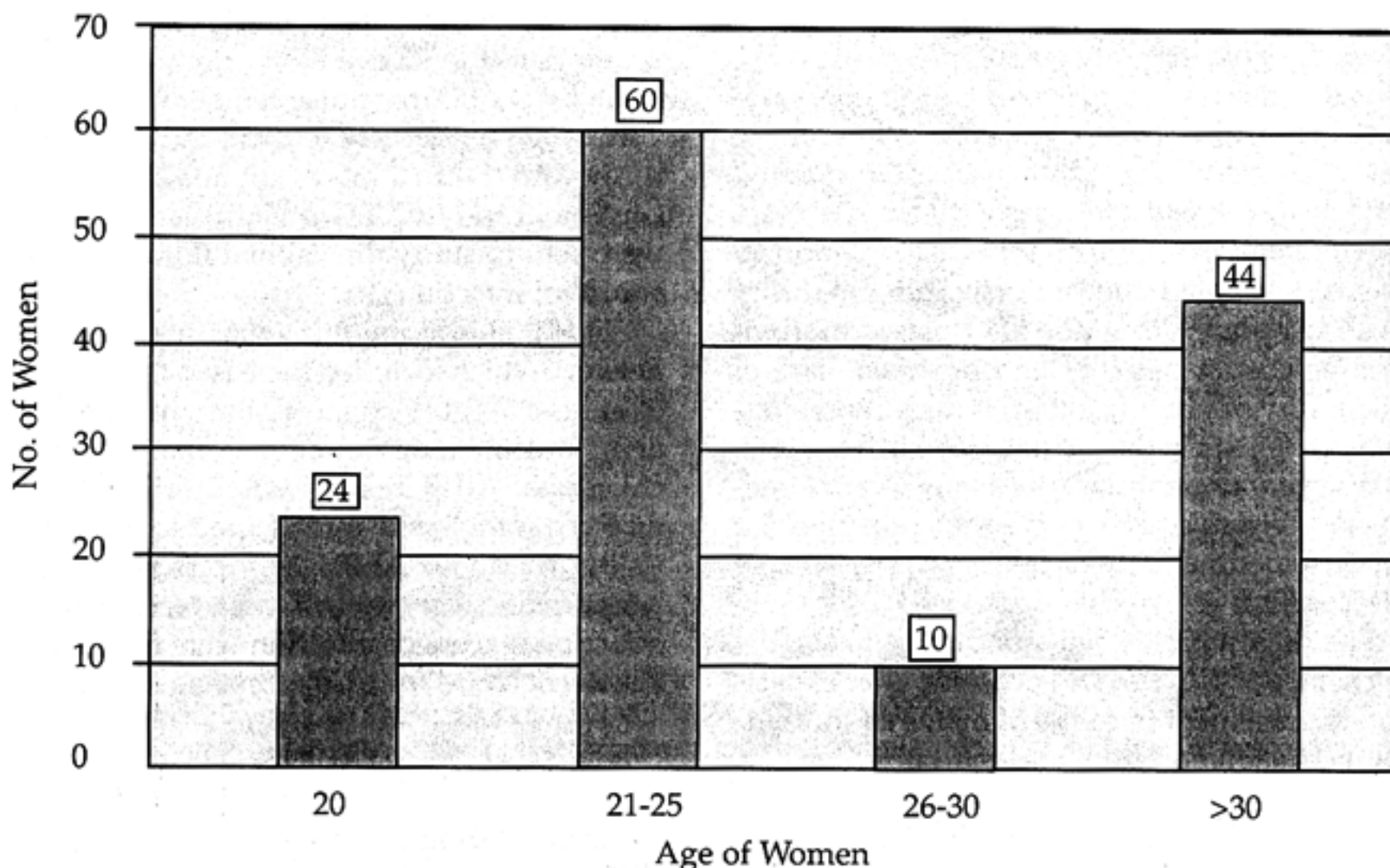
#### INCIDENCE OF PPRM

Fig. 1



## Incidence of PPRM

Fig. 2



**Patient Characteristics:** There were two peaks in the incidence of PPRM one between ages of 21-25 (44.1%) and another after 30 years (32.3%) Figure-2. The risk of PPRM was highest in women giving birth to their first child (35.3%) and in grand multi gravida (26.5%) Table-I.

Most women were uneducated 48.5% and belonged to lower (66.2% cases) or middle class (28% cases) Table-I. There was history of first or second trimester abortion in 17.6% cases and preterm delivery with or without rupture of membranes in 14.6% cases (Table-I).

#### Gestational Age at Admission

More than three fourth patient (76.4%) with PPRM were between 33-36 weeks of pregnancy. One-fourth (22.1%) cases were below 33 weeks gestation Table-II.

#### Latency Period

Seventy-four (54%) patients with PPRM were delivered in first 24 hours by spontaneous onset of labour. Another 33 (24%) were delivered upto 48 hours (Table-III). So approximately 78% of patients were delivered during the first 48 hours. Only 6% patients were still undelivered after one week. Cases with latency period more than one week were mostly below 33 weeks of gestation.

#### Indication and Mode of Delivery

One hundred and seventy cases (86%) had vaginal delivery, whereas 19 (14%) were delivered by caesarean section as shown in Table-IV. Labour was spontaneous in 89 (75%) of vaginal deliveries. Among 19 cases of caesarean section fetal distress was the commonest indication seen in 8 cases followed by failed induction in 6 cases (Table-IV).

Table-I: Obstetrical and socioeconomic characteristics of women with Pre-PROM

Variable	Number of women with pre-PROM	Percentage
<b>Education</b>		
No education	66	48.5%
Primary	35	25.7%
Matric	29	21.3%
Above	06	4.4%
<b>Social Class</b>		
Lower	90	66.2%
Middle	38	28%
High	08	5.8%
<b>Previous Obstetric History</b>		
Primigravida	48	35.2%
Multigravida with no previous history of abortion or preterm delivery	44	32.3%
Previous history of abortion	24	17.6%
Previous history of preterm delivery	20	14.7%

Table-II: Distribution of gestational age in cases of Pre-PROM

Gestational	No. of Patient	Percentage
< 33 weeks	30	22.1%
33-36 weeks	104	76.4%
>36 weeks	02	1.4%
<b>Total</b>	<b>136</b>	<b>100%</b>

**Perinatal Mortality**

For the present study it was 19.1% (26 cases) Table-V with major contribution from early

Table - III: Relationship between gestational age and latency period

Gestational Age	Latency Period				Total
	<24 hours	24-48 hours	48- weeks	> 1 week	
28-32 + weeks	06	05	12	07	30
33-34 + 6 weeks	26	20	08	01	55
35-36 weeks	40	08	01	—	49
>36 weeks	02	—	—	—	02
<b>Total</b>	<b>74 (54%)</b>	<b>33 (24%)</b>	<b>21 (15.4%)</b>	<b>8 (5.8%)</b>	<b>136</b>

Table-IV: Indication and mode of delivery

Mode of Delivery	Indication	Number
Vaginal Delivery of labour	Spontaneous onset	89
	Labour induction due to poor biophysical profile or 36 weeks completed	09
	Congenital abnormality	04
	Others	06
<b>Total</b>		<b>117 (86%)</b>
Caesarean Sections	Fetal distress	08
	Failed induction	06
	Malpresentations	—
	Flexed breech with cord prolapse.	02
	Transverse lie	01
	Twins with 1st breech	01
	Previous two C- sections	01
<b>Total</b>		<b>19 (14%)</b>

neonatal deaths (18) and the majority of such babies were below 2 kg weight as shown in Table-VI. Outcome of babies improved with increasing birth weight.

Table-V: Causes of adverse neonatal outcome

Causes	Number	Percentage
Intra-uterine deaths before pre-PROM	02	1.4%
Intra-uterine deaths in cases of pre-PROM during expectant management period	02	1.4%
Congenital anomalies		
Anencephalic	02	1.4%
Hydrocephalous	02	1.4%
Neonatal deaths	18	13.2%
<b>Total</b>	<b>26</b>	<b>19.1%</b>

### DISCUSSION

The incidence of PPRM cases in this study was 5.4% which is higher than the incidence in United Kingdom, America, France etc. where it is around 1-2%. This increased incidence may be explained on the basis of increased incidence of poverty, illiteracy, low maternal weight, young maternal age, nulliparity and grand multiparity all of which are risk factors for PPRM. The association between PPRM and low socio-economic status and less education has been observed in many studies<sup>10,11,12</sup>. In about 1/3rd cases of PPRM there was history of previous miscarriage or pre PPRM and this observation is consistent with findings in other studies<sup>11,13</sup>.

Expectant management was adopted for all cases in this study. Three fourth of women in this study had gestational age between 33-36 weeks and only one fourth below 33 weeks. This association is in close resemblance with study of Cox and Leveno<sup>14</sup>. It was noted that latency period was longer in women with PPRM at early gestation.

While noting the latency period it was found that 78% cases were delivered within 48 hours of PPRM and only 6% cases were undelivered after one week. This observation is in accordance with other studies.<sup>15,16</sup> It is apparent that

Table-VI: Relationship between weight of baby and outcome

Weight of baby	Outcome of baby		Total
	Alive	Dead	
<2 Kg.	30	16	46
2- 2.5 Kg.	70	08	78
> 2.5 Kg.	10	02	12
<b>Total</b>	<b>110(80.8%)</b>	<b>26 (19.2%)</b>	<b>136</b>

most pregnancies with PPRM do not permit expectant management for a meaningful duration.

In the majority of our hospital facilities N.I.C.U. are not available and lung maturity of babies can not be checked, so expectant management despite short latency period was adopted in this study to allow for antenatal steroid administration and awaiting spontaneous labour to decrease chances of respiratory distress syndrome (R.D.S.) in the newborn and decrease the chances of caesarean section due to labour induction<sup>17</sup>.

Caesarean section rate was 14% for this study. This is comparable to a study by Cox and Leveno<sup>14</sup> which reported the incidence to be 12% in expectantly managed cases between 33-34 weeks of gestation. However in some other studies it was as high as 34%<sup>18</sup>. This difference may be due to exclusion of cases of PPRM between 24-28 weeks of gestation in the present study. At this gestational age there are more chances of malpresentation with extremely low birth weight of preterm babies, hence delivery most of the time in this situation is by caesarean section to decrease the chances of traumatic delivery. The commonest indication of delivery in this study was spontaneous onset of labour (76%). It is closely related to study by Muller et al.<sup>18</sup>

To prevent maternal and neonatal sepsis some clinicians recommend universal prophylactic antibiotic usage in PPRM while others recommend selective use<sup>19</sup>. This issue of prophylactic antibiotics is still controversial with concerns about emergence of infection with resistant microorganisms<sup>20</sup>. It is however known that prophylactic antibiotic usage providing anaerobic coverage is associated with prolongation of pregnancy<sup>21</sup>.

The oracle 1 randomized trial (2001) concluded that use of Erythromycin for women with PPRM provides protective benefit for the neonate<sup>22</sup>. Perinatal mortality in the present study was around 20%. Excluding six unavoidable deaths (4 babies with lethal congenital anomalies, 2 with I.U.D. at admission) it becomes 14.7%. This is significantly higher than the perinatal mortality (P.N.M.) of PPRM in advanced world. It was 9.3% in the study by Mullter et al.<sup>18</sup> and 1.4% in a later study by Cox and Leveno<sup>14</sup>.

One explanation for this poor outcome may be attributed to overall increased rate of P.N.M. in Pakistan i.e. 51/1000 during the period 1987-1995 noted in Pakistan Demographic Health Survey (1990-1991)<sup>23</sup>. P.N.M. in Pakistan is about ten times higher than in advanced countries. Comparison of neonatal outcome in relation to weight of newborn showed that most of the babies who did not survive had birth weight less than 2 kg indicating that weight of babies at birth affect the outcome in terms of decreased mortality with increasing birth weight.<sup>24</sup>

Development of chorioamnionitis increases maternal morbidity and neonatal infection. Infections are the most common cause of neonatal deaths all over the world including Pakistan. About 40% admissions in neonatal ward are due to neonatal sepsis<sup>25</sup>. In the present study only clinical surveillance was relied upon to diagnose chorioamnionitis due to lack of facilities. So cases of PPRM with sub-clinical infections could not be diagnosed exposing both mother and baby to increased risk of infection and increasing P.N.M. in the present study.

Improving perinatal mortality in PPRM demands availability of N.I.C.U. facilities.

Gestational age at delivery and birth weigh both affect neonatal survival so expectant management is advised in PPRM to achieve this end. The steroids should be used to improve lung maturity in fetuses below 36 weeks<sup>5</sup>. Prophylactic antibiotic therapy is helpful to decrease maternal morbidity and perinatal sepsis.

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