

# Risk of Recurrence of Preterm Premature Rupture of Membranes in Subsequent Pregnancies

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The study was designed to estimate the risk of recurrence of preterm premature rupture of membranes in subsequent pregnancies. 121 patients with idiopathic PROM were followed up over two or more subsequent pregnancies and the problem recurred in 39 patients, for a rate of 32.2%. Various demographic data and characteristics of the index pregnancies were compared to identify a sub-group of patients at higher risk of recurrence in an attempt to prevent problem of prematurity.

**Key Words:** Preterm premature rupture of membranes, recurrence

Preterm premature rupture of membranes occurs in approximately 1% to 2% of all pregnancies.<sup>1,2</sup> The cause remains unknown in most cases, although many predisposing conditions have been identified, including factors such as incompetent cervix, uterine anomalies, multiple gestations, infection and trauma.

In many studies preterm premature rupture of membranes is the most commonly identified factor associated with preterm deliveries, occurring in >30% of all such births<sup>3,4</sup>

In counseling such patients we are currently unable to tell them the risk of recurrence of preterm premature rupture of membranes in subsequent pregnancies. The purpose of this study was to identify the risk of recurrence to help in the management of such patients.

## Material and Methods

Lady Willingdon Hospital, Lahore is a 235 bedded teaching hospital for obstetrics and gynaecology, affiliated with King Edward Medical College, Lahore. This study was carried out in unit II for a period of two years from January 2002 till December 2003.

Preterm premature rupture of membranes was defined as rupture of membranes before 36 completed weeks of gestation. In all patients rupture of membranes was documented by sterile speculum examination with pooled fluid, ferning, and alkaline pH determination (Nitrazine paper). An estimate of gestational age was derived from the last menstrual period and ultrasonographic examination on admission.

Patients with the diagnosis of incompetent cervix, uterine anomalies, multiple gestation and neonates with congenital anomalies were excluded from the study pool. During the study period 1050 patients with preterm premature rupture of membranes were identified; 121 met the inclusion criteria and had consecutive pregnancies under our care at Lady Willingdon Hospital. Characteristics as age, gravidity, parity, gestational age at rupture of membranes and at delivery were noted for all patients. A comparison was then carried out between patients who showed recurrence and those who did not have problem in subsequent pregnancy.

## Results

Of the 121 patients evaluated, 110 underwent follow-up for one subsequent pregnancy and 11 patients had follow-up of two or more subsequent pregnancies. Resulting in a total of 255 pregnancies. Preterm premature rupture of membranes recurred in 39 patients, for a rate of 32.2%. As shown in Table 1 the average estimated gestational age at preterm premature rupture of membranes in the index pregnancy was 32.1±4.9 weeks. The average latency period was 4.5±14.6 days and the mean interval between pregnancies was 18.5±11.4 months.

Table 1. Characteristics of index pregnancies

Estimated gestational age at pre-term premature rupture of membranes (index pregnancy) (wk)	32.1±4.9
Latency period (index pregnancy) (days)	4.5 ±14.6
Interval between pregnancies (mo)	18.5 ± 11.4

Data mean ± SD.

Table 2. Demographic comparisons

	No preterm premature rupture of membranes in next pregnancy (n=82)	Preterm premature rupture of membranes in next pregnancy (n=39)
Maternal age (yr)	21.0±5.2	21.2±5.4
Gravidity	2.4±5.2	2.3±1.2
Parity	0.5±0.9	0.7±0.9
Estimated gestational age at preterm premature rupture of membranes (wk)	31.5±4.7	30.9±5.1
Estimated gestational age at delivery (wk)	32.4±4.3	31.5±4.7
Latency (days)	6.2±16.1	3.9±4.7
Interval (month)	28.7±13.3	28.1±13.6
Next estimated gestational age at delivery (wk)	38.6±3.0	33.0±5.1

Date are mean ±SD

Table 2 compares demographic and other characteristics between the group of patients without preterm premature rupture of membranes in their next pregnancy and those



with recurrence. The differences observed did not achieve statistical significance. We then analyzed the effect of length of the latency period in the index pregnancy on the probability of recurrence of preterm premature rupture of membranes in the next pregnancy; we were unable to demonstrate an association. A similar analysis looking at the interval between pregnancies, the gestational age at delivery in the index pregnancy, and the gestational age at preterm premature rupture of membranes in the subsequent pregnancy failed to show any significant associations with the risk of recurrence.

#### Comment

The issue of recurrence of preterm premature rupture of membranes in consecutive pregnancies has remained essentially unexplored. A 15-year review of the literature yielded only one such study performed by Naeye<sup>5</sup> in 1982. He reviewed the course of consecutive pregnancies of 5230 women who had been enrolled in the Collaborative Perinatal Project of National Institute of Neurological and Communicative Disorders and Stroke between 1959 and 1966. The total number of pregnancies analyzed was 10,460; however, the incidence of preterm premature rupture of membranes was not given. The rate of recurrence in patients with preterm premature rupture of membranes in their index pregnancies was 21 %, as compared with only 4 % when the index pregnancy went to term.

A history of preterm delivery without rupture of membranes in the initial pregnancy was associated with a 10% risk of preterm premature rupture of membranes in the next pregnancy<sup>6</sup>. The stated purpose of Naeye's study was to evaluate the factors that predispose to premature rupture of membranes. It was not specifically designed to address the question of recurrence. In addition, it is limited by the inherent errors in accurately assessing the estimated gestational age and the incidence of preterm premature rupture of membranes in such a wide collaborative study involving 12 centers and spanning 7 years.

In our study estimated gestational ages were calculated from the last menstrual period and were confirmed by an ultrasonographic examination, on admission in every case. By excluding patients with incompetent cervix, uterine anomalies, multiple gestations and fetuses with congenital anomalies, we tried to define a subgroup of patients with true idiopathic preterm premature rupture of membranes. Whereas we did not correlate the cervicovaginal microbiologic flora with the risk of recurrence, it is important to note that none of the 39 patients with recurrence has evidence of clinical amnionitis at the time of rupture of membranes in the second pregnancy. Surprisingly, we were unable to demonstrate an association between the estimated gestational age at the time of rupture in the index

pregnancy and the probability of recurrence in the next pregnancy. Similarly, we were not able to show that patients with a longer latency period in the index pregnancy were less likely to have recurrent preterm premature rupture of membranes. The estimated gestational age at the time of preterm premature rupture of membranes in the index pregnancy of patients recurrence was 30.9±5.1 weeks, as compared with 33.0±5.1 weeks at the time of the recurrence. Although the difference did not reach statistical significance ( $p = 0.07$ ), there was a strong trend suggesting that patients with recurrent preterm premature rupture of membranes will have ruptured membranes at a later gestational age in the next pregnancy. The main limitation of this analysis is its low "capture" rate, having only 121 patients return to our care for their subsequent pregnancies. However, these patients returned to our hospital of their own accord and were not referred back by their private physicians. This, we believe, eliminates any selection bias that may have occurred. There is no apparent reason why patients who were delivered at our hospital in their subsequent pregnancies would be different from patients delivered at other institutions.

Overall, the above data demonstrate that there is a significant tendency for preterm premature rupture of membranes to be repeated in consecutive pregnancies.<sup>7,8</sup> We hope that this study will facilitate the counseling of patients with preterm premature rupture of membranes and help the clinician in identifying a group of patients in need of closer observation and follow-up as part of an overall prematurity prevention program.

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