Outcome of Preterm Premature Rupture of Membranes

VORAPONG PHUPONG, M.D.*,
SURASAK TANEEPANICHSKUL, M.D., MPH.*

Abstract

Objective : To study the incidence and outcome of preterm premature rupture of membranes (PPROM).

Design : Cross-sectional study.

Setting : Department of Obstetrics and Gynecology, Faculty of Medicine, Chulalongkorn University.

Subjects : Ninety five PPROM women who were expectant management and delivered between January 1, 1997 and December 31, 1997.

Results : The incidence of PPROM was 7.2 per 1000 deliveries. There were 51 women in the gestational age group at or below 34 weeks and 44 women in the gestational age group above 34 weeks. Gestational age, total antenatal care visits, total weight gain and neonatal birth weight were significantly lower in the gestational age group at or below 34 weeks ($p<0.05$). Abnormal delivery, maternal and neonatal complications were significantly more common in the gestational age group at or below 34 weeks ($p<0.05$). Total maternal and neonatal hospital-stay comprised significantly more days in the gestational age group at or below 34 weeks ($p<0.05$).

Conclusion : Maternal and neonatal outcome were more unfavorable in the gestational age group at or below 34 weeks of PPROM. Expectant management should intervene at the gestational age at or below 34 weeks of PPROM due to unfavorable maternal and neonatal outcome.

Key word : Preterm, Premature Rupture of Membranes, Outcome

PHUPONG V & TANEEPANICHSKUL S
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* Department of Obstetrics & Gynecology, Faculty of Medicine, Chulalongkorn University, Bangkok 10330, Thailand.

Preterm premature rupture of membranes (PPROM) is defined as rupture of membranes before onset of labor and before 37 completed weeks of pregnancy[1,2]. It accounts for 10-40 per cent of PROM cases[3,4]. The outcome of PPROM varies. The aim of this study was to investigate the incidence and outcome of pregnancy in cases of PPROM.

MATERIAL AND METHOD

The cases were selected from obstetrics chart records at the Department of Obstetrics and Gynecology, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand from January 1, 1997 to December 31, 1997. Cases were identified by computer selection from the data files. They were PPROM cases of expectant management. We divided the cases into two groups according to the gestational age. The first group was at a gestational age of 34 weeks or below. The second group was at a gestational age above 34 weeks.

The following variables were extracted from the chart records : maternal age, gravida, parity, gestational age, total antenatal care visits, total weight gain, number of fetuses, serology, route of delivery and outcome. The outcome of the study was differentiated as latency period, maternal and neonatal outcome, respectively.

The latency period was defined as the time from rupture of membranes to delivery[5]. The diagnosis of chorioamnionitis was made on the basis of clinical criteria of maternal fever or at least two of the following : tachycardia, uterine tenderness, foul smelling amniotic fluid, fetal tachycardia, with or without maternal leukocytosis[6].

Data were summarized applying descriptive statistics. Group difference data were tested for significance with chi square test (two-tailed). $P < 0.05$ was considered statistically significant.

RESULTS

In total, deliveries amounted to 13,206 cases in the year 1997. Total PROM occurred in 766 cases, whereas, PPROM occurred in 95 cases. The incidence of PPROM was 7.2 per 1000 deliveries and 12.4 per cent of the PROM cases. There were 51 cases in the gestational age group at or below 34 weeks and 44 cases in the gestational age group above 34 weeks. Maternal and obstetrics characteristics are shown in Table 1. Some maternal and obstetrics characteristics were significantly different between the two groups. Gestational age, number of antenatal care visits and total weight gain were significantly lower in the gestational age group at or below 34 weeks. Parity above 1 and abnormal delivery were significantly more common in the gestational age group at or below 34 weeks. Maternal age, gravida, number of fetuses, maternal HBsAg and anti-HIV were not significant in either group. All cases were negative for VDRL.

Maternal outcome is shown in Table 2. Hospital stay was significantly longer in the gestational age group at or below 34 weeks but the time from rupture of membranes to arrival at the hospital and latency period were not significantly different between both groups. Maternal complications were also common in the gestational age group at or below 34 weeks (13.7%) but were not found in the gestational age group above 34 weeks. There were 6 chorioamnionitis cases (11.8%) and one postpartum endometritis case (2%).

Neonatal outcome is shown in Table 3. Birth weight was significantly lower in the gestational age group at or below 34 weeks, total admission days were significantly longer in the gestational age group at or below 34 weeks and neonatal complications were more common in the gestational age group at or below 34 weeks. But the apgar score at 1 and 5 minutes and the number of neonatal intensive care unit (NICU) admission days were not significantly different between both groups. Abnormality was found among 5.9 per cent of the gestational age group at or below 34 weeks. Details of neonatal complications are shown in Table 4. The most common neonatal complication was infection found among 35.3 per cent of the gestational age group at or below 34 weeks.

DISCUSSION

In the present study, the incidence of PPROM was 7.2 per 1000 deliveries. Accounting for 12.4 per cent of PROM cases compatible with previous studies[3,4]. We divided PPROM into two groups according to the gestational age at rupture of membranes. We used the gestational age of 34 weeks as the cutoff level because the neonatal outcome at a gestational age beyond 34 weeks is good[3]. This study confirmed those results.

The mean latency period of our patients with PPROM was 42 ± 65.7 hours with no significant difference between the groups. The mean latency period of PPROM with a gestation age of

Table 1. Maternal and obstetrics characteristics according to gestational age at rupture of membranes.

	Gestational age ≤ 34 weeks	Gestional age > 34 weeks	95% Confidence Interval	P-value
Age (years)	26.2 ± 5.4	25 ± 4.7	-0.88, 3.28	NS
Gravida				
1	24	27		
>1	27	17	-0.34 , 0.55	NS
Parity *				
1	33	32		
>1	18	12	0.18 , 0.56	P <0.05
Gestational age * (weeks)	31.8 ± 2.2	35.5 ± 0.5	-4.37 , -3.03	P <0.05
ANC visits *	4.8 ± 0.6	6.1 ± 2.2	-1.94 , -0.66	P <0.05
Total weight gain * (kgs)	8.7 ± 3.4	11.5 ± 3.3	-4.17 , -1.43	P <0.05
Number of fetuses				
Single	48	41		
Twins	3	3	-0.08 , 0.11	NS
Serology				
• HbsAg				
Positive	2	1		
Negative	49	43	-0.05 , 0.85	NS
• Anti HIV				
Positive	1	2		
Negative	48	42	-0.09 , 0.4	NS
Route of delivery *				
Normal	32	29		
Abnormal	191	15	0.09 , 0.48	P <0.05

ANC : Antenatal care
* Significance at $p < 0.05$

Table 2. Maternal outcome according to gestational age at rupture of membranes.

	Gestational age ≤ 34 weeks	Gestational age > 34 weeks	95% CI	P-value
Time from rupture to arrival at the hospital (hours)	20.3 ± 50.0	16.4 ± 54.0	-17.3 , 25.1	NS
Latency period (hours)	48.2 ± 72.4	34.8 ± 57.1	-13.5 , 40	NS
Hospital stay (days) *	8.5 ± 5.0	6.6 ± 3.5	0.11 , 3.69	P <0.05

* Significance at $p < 0.05$

Table 3. Neonatal outcome according to gestational age at rupture of membranes.

	Gestational age ≤ 34 weeks	Gestational age >34 weeks	95% CI	P-value
Birth weight (grams) *	1949 ± 381	2273 ± 266	-460 , -188	P <0.05
Apgar at 1 min	8.1 ± 1.9	8.7 ± 1.3	-1.27 , 0.07	NS
Apgar at 5 min	9.4 ± 1.8	9.9 ± 0.3	-1.05 , 0.05	NS
NICU (days)	5.7 ± 14.8	1.5 ± 6.6	-0.59 , 9.0	NS
Total admission (days) *	17.1 ± 21.9	7.9 ± 13.3	1.67 , 16.7	P <0.05
Complications (cases) *	26	11	0.07 , 0.45	P <0.05

NICU = Neonatal intensive care unit
* Significance at $p < 0.05$

Table 4. Neonatal complications according to gestational age at rupture of membranes.

	Gestational age ≤ 34 weeks	Gestational age > 34 weeks
Infection (%)	35.3	6.8
Sepsis (%)	13.7	2.3
Pneumonia (%)	17.7	4.6
RDS (%)	7.8	2.3
NEC (%)	3.9	0
IVH (%)	2	0
Birth trauma (%)	3.9	4.6
Stillbirth (%)	2	0
Death (%)	3.9	0

34 weeks or below was 48.2±72.4 hours, similar to the report by McGregor et al[7]. Ninety four point seven per cent of our patients delivered within one week which was compatible with the report by Mercer et al[8].

Maternal morbidity amounted to 7.4 per cent in the present study. Chorioamnionitis and postpartum endometritis occurred among 6.3 per cent and 1.1 per cent, respectively. All cases occurred in the gestational age group at or below 34 weeks which was similar to previous reports in that clinical chorioamnionitis and postpartum infection occurs among 13-60 per cent and 2-13 per cent, respectively[9-13]. In our study, the incidence of infection increased with decreasing gestational age at membranes rupture[1,14,15]. Duration of hospital-stay and abnormal deliveries were also increased in the gestational age group at or below 34 weeks. Some reports found that PROM were also at higher risk for cesarean delivery[3,16]. The study reported by Cox et al[16] showed the risk of cesarean delivery at nearly 40 per cent, however, this study showed only a 25.3 per cent necessity of cesarean delivery. There was no maternal mortality in this study.

In the present study, neonatal morbidity and mortality occurred among 39 per cent and 2.1 per cent, respectively. Either one was more significantly common in the gestational age group at or below 34 weeks. The most common complication in our study was infection, especially pneumonia in contrast with previous reports[10,17] where respiratory distress syndrome (RDS) has been the most common complication. RDS in our study amounted to 5.3 per cent and was found among 7.8 per cent of the gestational age group at or below 34 weeks and among 2.3 per cent of the gestational age group above 34 weeks. Data from the March of Dimes Database reported by Robertson et al[18] showed a decrease in the incidence of RDS from virtually 100 per cent at 25 weeks' gestation to near zero at 37 weeks' gestation in women with preterm labor. The present as well as previous studies[19-21] showed that the risk of RDS rose with decreasing gestational age. The incidence of intraventricular hemorrhage (IVH), patent ductus arteriosus (PDA) and necrotizing enterocolitis (NEC) markedly decreases after 32 weeks' gestation and is virtually zero after 34 weeks' gestation[3]. This study also found that RDS, NEC, and IVH were lower in the gestational age group above 34 weeks. In our study, neonatal sepsis was found among 13.7 per cent of the gestational age group at or below 34 weeks and among 2.3 per cent of the gestational age group above 34 weeks. Alexander et al[3] reported the incidence of neonatal sepsis was high at a lower gestational age. This study also demonstrated lower birth weight and more prolonged neonatal hospital stay in the gestational age group at or below 34 weeks but no difference between both groups was seen in the apgar score.

In the present study, neonatal mortality was found among 3.9 per cent of the gestational age group at or below 34 weeks. In contrast, there was no neonatal mortality in the gestational age group above 34 weeks. Copper et al reported that neonatal mortality decreased with increasing gestational age[22].

In conclusion, in this study maternal and neonatal outcome was more unfavorable in the gestational age group at or below 34 weeks of PPROM. Expectant management should intervene in the gestational age group at or below 34 weeks of PPROM due to unfavorable maternal and neonatal outcome.

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ผลของการตั้งครรภ์ในภาวะถุงน้ำคร่ำแตกก่อนการเจ็บครรภ์คลอดที่การตั้งครรภ์ยังไม่ครบกำหนด

วรพงศ์ ภู่พงศ์, พ.บ., สุรศักดิ์ ฐานีพานิชสกุล, พ.บ., ส.ม.**

วัตถุประสงค์ : เพื่อศึกษาถึงอุบัติการและผลของการตั้งครรภ์ในสตรีตั้งครรภ์ที่มีภาวะถุงน้ำคร่ำแตกก่อนการเจ็บครรภ์คลอดที่การตั้งครรภ์ยังไม่ครบกำหนด

รูปแบบการวิจัย : การศึกษาแบบ Cross-sectional

สถานที่ทำการวิจัย : ภาควิชาสูติศาสตร์-นรีเวชวิทยา คณะแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

กลุ่มตัวอย่าง : สตรีตั้งครรภ์ที่มีภาวะถุงน้ำคร่ำแตกก่อนการเจ็บครรภ์คลอดที่การตั้งครรภ์ยังไม่ครบกำหนดที่ได้รับ การดูแลรักษาแบบ Expectant และคลอดในระหว่างวันที่ 1 มกราคมถึงวันที่ 31 ธันวาคม พ.ศ. 2540 จำนวน 95 ราย

ผลการวิจัย : อุบัติการของภาวะถุงน้ำคร่ำแตกก่อนการเจ็บครรภ์คลอดที่การตั้งครรภ์ยังไม่ครบกำหนดเท่ากับ 7.2 ต่อการคลอด 1,000 ราย มีสตรีที่มีอายุครรภ์น้อยกว่าหรือเท่ากับ 34 สัปดาห์จำนวน 51 ราย และอายุครรภ์มากกว่า 34 สัปดาห์จำนวน 44 ราย ในกลุ่มที่มีอายุครรภ์น้อยกว่าหรือเท่ากับ 34 สัปดาห์พบว่าอายุครรภ์ จำนวนครั้งของการฝากครรภ์ น้ำหนักที่เพิ่มระหว่างการตั้งครรภ์และน้ำหนักทารกแรกคลอดมีค่าน้อยกว่าอย่างมีนัยสำคัญทางสถิติ ($p < 0.05$) ในกลุ่มที่มีอายุครรภ์น้อยกว่าหรือเท่ากับ 34 สัปดาห์พบการคลอดที่ผิดปกติ ภาวะแทรกซ้อนในมารดาและทารกมากกว่าอย่างมีนัยสำคัญทางสถิติ ($p < 0.05$) และพบว่าในกลุ่มที่มีอายุครรภ์น้อยกว่าหรือเท่ากับ 34 สัปดาห์มีจำนวนวันที่อยู่ในโรงพยาบาลของมารดาและทารกนานกว่าอย่างมีนัยสำคัญทางสถิติ ($p < 0.05$) ด้วยเช่นกัน

สรุปผลการวิจัย : ผลของมารดาและทารกในกลุ่มที่มีอายุครรภ์น้อยกว่าหรือเท่ากับ 34 สัปดาห์พบว่าไม่ดี ดังนั้น การดูแลรักษาควรจะเป็นแบบ Expectant ในกลุ่มที่มีอายุครรภ์น้อยกว่าหรือเท่ากับ 34 สัปดาห์

คำสำคัญ : การตั้งครรภ์ก่อนกำหนด, ภาวะถุงน้ำคร่ำแตกก่อนการเจ็บครรภ์, ผลลัพธ์

วรพงศ์ ภู่พงศ์, สุรศักดิ์ ฐานีพานิชสกุล
จดหมายเหตุทางแพทย์ ฯ 2543; 83: 640-645

* ภาควิชาสูติศาสตร์-นรีเวชวิทยา, คณะแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย, กรุงเทพ ฯ 10400