International Journal of Clinical Obstetrics and Gynaecology

ISSN (P): 2522-6614
ISSN (E): 2522-6622

www.gynaecologyjournal.com
2022; 6(1): 95-98
Received: 16-11-2021
Accepted: 18-12-2021

Dr. Ashraf Memon
Associate Professor, Department of Obstetrics & Gynecology, Gujarat Adani Institute of Medical Science, Bhuj, Kutch, Gujarat, India

Dr. Nagajan Bhadarka
Professor, Department of Obstetrics & Gynecology, Gujarat Adani Institute of Medical Science, Bhuj, Kutch, Gujarat, India

Corresponding Author:
Dr. Nagajan Bhadarka
Professor, Department of Obstetrics & Gynecology, Gujarat Adani Institute of Medical Science, Bhuj, Kutch, Gujarat, India

Maternal and fetal outcome in preterm premature rupture of membrane: A cross-sectional study

Dr. Ashraf Memon and Dr. Nagajan Bhadarka

DOI: https://doi.org/10.33545/gynae.2022.v6.i1b.1119

Abstract
Background and Aim: Premature rupture of membrane before 37 wks. Gestation is known as preterm premature rupture of membrane (PPROM). The key factor in the fetal and maternal outcome is that the diagnosis of pre labour rupture of membranes must be established. The aim of this study was to assess maternal and fetal outcome in women with premature rupture of membranes.
Material and Methods: Present study was prospective, analytical hospital based study. The study was conducted at Tertiary care Institute of India. The study population includes 200 obstetrics cases of singleton pregnancy with gestational age of 28 weeks to 36 weeks with spontaneous rupture of membranes over a period of 1.5 years. Detailed clinical examination of the patient was done to see any co-morbidity. Data was collected using a performa. Detailed workup including history, general physical examination, abdominal and pelvic examination and relevant specific investigation were noted.
Results: Maximum numbers of cases (50%) were primigravida and 25% were 2nd gravida. In 69% women duration of leaking was < 12 hours and in 8% women duration of leaking was> 24 Hours. Out of 200 cases 67% delivered vaginally and 33% were LSCS. Commonest neonatal mortality was respiratory distress syndrome. Those maximum numbers of NICU admission in cases as well as control group were in gestational age 34-36 weeks.
Conclusion: Most common cause of PPROM was unknown. Most common maternal morbidity was puerperal fever and neonatal morbidity was respiratory distress. Maternal and fetal morbidity increases with increase in duration between rupture of membranes and delivery of fetus, so augmentation of labour should be done. In our study most common cause of cesarean was previous cesarean.

Keywords: gestation, primigravida, premature rupture of membrane, respiratory distress

Introduction
Premature rupture of membrane (PROM) refers to the disruption of fetal membranes before the beginning of labor, resulting in spontaneous leakage of amniotic fluid [1]. PROM, which occurs prior to 37 weeks of gestation, defi ned as preterm PROM as PROM that occurs after 37 weeks gestation defined as term PROM. PROM occurs in approximately 5%–10% of all pregnancies, of which approximately 80% occur at term [2]. It is one of the leading identifiable causes of pre-maturity. PPROM is a condition that occurs in 3% of all pregnancies and is responsible for approximately 30% of all preterm deliveries [1]. Eighty five percent of neonatal morbidity and mortality is result of prematurity. PPROM remote from term is associated with significant perinatal morbidity and mortality that decreases with advancing gestational age at delivery. Alternatively, PPROM near term with expeditious delivery of non-infected and non-asphyxiated infants is associated with a high likelihood of survival and a low risk of severe morbidity. When PROM occurs remote from term, significant risks of morbidity and mortality are present for both the mother and fetus. Thus, the physician caring for the pregnant woman plays an important role in management and need to be familiar with potential complications and possible interventions to minimize risks and maximize the probability of the desired outcome.
Premature rupture of membrane is common occurrence with an incidence of 5-10%. It is a significant event as it causes maternal complications, increased operative procedures, neonatal morbidity and mortality [3]. PPROM occurs in 3% of pregnancies and causes around 25-30% of all preterm deliveries. Since PPROM is associated with lower latency from membrane rupture until delivery, it is an important cause of perinatal morbidity and mortality [4, 5]. During the latency period, the ascent of pathogenic microorganisms from the lower genital area could create complications such as intrauterine infections.

Also, some studies introduced PROM as a pathologic process that often occurs following membrane inflammation and infection [6]. However, one of the most common complications in PPROM patients is intrauterine infection, which can lead to chorioamnionitis, metritis after delivery and perinatal outcome such as neonatal sepsis. Other complications are cord compression leading to fetal distress; cord prolapsed during rupture of membranes and placental abruption. Perinatal outcomes constitute prematurity, neonatal sepsis, respiratory distress syndrome (RDS), intraventricular hemorrhage (IVH), and risk of fetal and neonatal death [7].

PROM is linked to significant maternal and fetal morbidity and mortality. It has been shown to be the cause of 18%–20% and 21.4% of prenatal mortalities and morbidity respectively.[8,9] The three causes of fetal death associated with PROM are sepsis, asphyxia, and pulmonary hyperplasia. Women with intrauterine infection deliver earlier than non-infected women, and infants born with sepsis have a mortality rate four times higher than those without sepsis do [10]. Maternal complications include intra-amniotic infection, which occurs in 13%–60% of women with PROM, placental abruption, and postpartum endometritis [11, 12]. Pre-term birth, infection, hypertensive disease, and asphyxia are cited as the most common contributors to maternal and fetal mortality in developing countries (LMICs) [13, 14].

Evidence suggests that the rupture of membrane is related to infection [15]. membrane dysfunction on a molecular level,[16] collagen destruction, and programmed cell death in fetal membranes [17, 18]. The complication risk of PROM is increased if the mother has previous PROM, low body mass index, concomitant infection of the gestational tissues, and longer the time elapsed between the rupture and delivery [19, 20]. Diagnosis and proper management is very important to limit various fetal and maternal complications generally due to infection. However, in countries like Ethiopia where health facilities not well organized with necessary manpower, a large number of mothers come to the facilities late.

The key factor in the fetal and maternal outcome is that the diagnosis of pre labour rupture of membranes must be established. In most instances either it is obvious from the release of clear amniotic fluid from cervix or by simple laboratory test like detection of fern pattern. The key to the management is an accurate assessment of gestational age and the presence or absence of sepsis. However the management is especially difficult in preterm patient in whom the risk of foetal and maternal infection that can accompany expectant treatment has to be weighed against potential improvement in neonatal outcome that comes with greater maturity of foetal lungs.[21] Currently most authorities accept a plan of active management which includes prevention of infection, delay of delivery until foetal maturity is achieved, and active intervention by induction if labor is no longer preventable or if early infection is suspected [22]. The aim of this study was to assess maternal and fetal outcome in women with premature rupture of membranes.

Material and Methods

Present study was prospective, analytical hospital based study. The study was conducted at Tertiary care Institute of India. The study population includes 200 obstetrics cases of singleton pregnancy with gestational age of 28 weeks to 36 weeks with spontaneous rupture of membranes over a period of 1.5 years. The cases that fulfils the inclusion criteria was selected. Women with multiple pregnancy, gestational age 36 weeks, pregnancy with any of medical disorder, cases with meconium stained liquor, faetal distress, intrauterine death, non-vertex presentation, artificial rupture of membranes and congenital malformations were excluded from the study.

200 pregnant women without PROM up to 36 completed weeks are taken as control. Pregnant women with complain of leaking >28 and up to 36 week coming from antenatal, outdoor, emergency were admitted and were enrolled in the study. Ethical approval was taken from the institutional ethical committee and written informed consent was taken from all the participants. A detailed history was taken age, parity, menstrual and obstetric history with emphasis on exact time of rupture, duration, amount of leaking and association of pain, history of previous similar episodes in other pregnancies and history suggestive of incompetent were evaluated. Detailed history regarding recent coitus, severe physical exertion and vaginal examinations if any before admissions was noted. In general examination pulse, BP and temperature were noted followed by systemic examination in obstetric uterine height, presentation, position, lie of fetus and amount of liquor were noted. All parameters of maternal and fetal well-being were recorded. A sterile speculum examination was conducted and presence of liquor amni was noted. When frank leaking was present litmus test performed. When no amniotic fluid was seen in the vagina, patient was asked to cough and per speculum done to see the drainage of amniotic fluid. In case of doubt fluid from vagina was collected on slide and examined under microscope for ferning. A single pelvic examination was done to note the Bishop's score presence or absence of membranes, presenting part and its station and to rule out cord prolapse and also pelvic assessment. All patients with leaking received prophylactic antibiotics. Thereafter the patient was monitored 4th hourly for signs of infections. A 4th hourly monitoring of pulse, BP, temperature and presence or absence of contractions was made whenever required. The same was carried out more frequently. Fetal heart rate monitored regularly. Conservative management was done in all cases of PPROM for 24 hours provided there were no maternal or fetal indications for delivery. If patient did not go in labour they were induced with cerviprime gel and syntocinon for vaginal delivery. In cases of failed vaginal delivery or any complications caesarean section was done. Two doses of betamethasone 12 mg i.m. 12 hours apart were given to mothers.

The recorded data was compiled and entered in a spreadsheet computer program (Microsoft Excel 2007) and then exported to data editor page of SPSS version 15 (SPSS Inc., Chicago, Illinois, USA). For all tests, confidence level and level of significance were set at 95% and 5% respectively.

Results

In present study majority belonged to 21-25 age group within PROM patients and control group and maximum number of patients were unbooked. Maximum numbers of cases were primigravida 50% and 25% were second gravida. Table 1 shows those maximum numbers of cases (50%) were primigravida and 25% were 2nd gravida. Table 2 shows that in 69% women duration of leaking was < 12 hours and in 8% women duration of leaking was> 24 Hours. Table 3 shows that out of 200 cases 67% delivered vaginally and 33% were LSCS. Commonest neonatal mortality was respiratory distress syndrome. Those maximum numbers of NICU admission in cases as well as control group were in gestational age 34-36 weeks.

Table 1: Parity-wise distribution

Parity	Case	Control	P value
Primigravida	100	104	0.5
Gravida-2	50	56	
Gravida-3	32	36	
≥G-4	18	4	
Total	200	200	

Test applied chi-square test

Table 2: Duration of leaking wise distribution of case

Duration of leaking (hours)	No. of patients	Percentage
<12	138	69
12-24	46	23
>24	16	8
Total	200	100

Table 3: Type of delivery wise distribution

Mode of delivery	Case	Control	P value
Vaginal delivery	134	156	0.01*
LSCS delivery	66	44	
Total	200	200	

*indicates statistically significance at p≤0.05
Test applied chi-square test

Discussion

Premature rupture of membranes is fairly a common complication of pregnancy and can lead to increased maternal complications, operative procedures, neonatal morbidity and mortality the present study was undertaken to identify risk factors causing PROM and to study labor outcome maternal morbidity and perinatal morbidity and mortality associated with PPROM. Most Studies found higher incidence of PPROM 68.8% in women belonging to low socioeconomic status. In study by Arij Faksh Doa *et al.* [23] incidence of PPROM was 64.5% in primigravida, 17.8% in gravida II and 17.75% in multi gravida. While in study by Joelle M Lieman *et al.* [24] found 43% women with PPROM were primigravida, incidence of PPROM was 7.2% in which 48.8% cases were between 34-36, 26% between 31-33 weeks, 14.4% between 28-30 weeks, 3.4% at 27 weeks and 7.2% at less than 26 weeks.

In our study it is evident that 62% are unknown factors of PPROM and history of coitus 5%, 4% UTI. Findings correlate with the study of Patil *et al*. with unknown factors by 59% and history of coitus 10%, UTI 6% as a cause of PPROM [25]. Our study shows 50% of PPROM case were primi and 25% 2nd gravida, 16% 3rd gravida. It shows that PROM occurs more frequently in primigravida compared to that of multigravida. This could be explained on the basis of less married life and more frequency of coitus, causing ascending infections and UTI, prostaglandin production causing direct toxic effect on membranes. Our study is comparable with the study of Jameela *et al.* [26].

Our study shows that 69%women of PPROM leaking time was less than 12 hours. 23% from 12-24 hours and 8% >24 hours. This could be explained on the basis that most of the patients were unbooked and they reported to the concerned CHC or PHC early and were referred to higher center immediately due to lack of NICU facility. Our findings are comparable with the study of Shailaja *et al.* [27].

In our study 69.86% were delivered vaginally spontaneously, while 13.69% were induced with cerviprime gel, 8.21% induced with syntocinon. Patil *et al*. showed 19% spontaneous vaginal delivery and 17.8% induced by cerviprime gel while Minakeshi *et al*.show 66% spontaneous vaginal delivery and 34% induced with cerviprime gel [25, 26]. Our study is comparable with the study of Patil *et al*. and Minakeshi *et al*. [25, 26] Our study shows that out of 200 cases, 24% accounted for respiratory distress syndrome, 12% septicemia. Our study is comparable with study of Patil *et al*. and Padma *et al*.[25,28] Present study shows out of 200 cases each in the study and control group, 34% were admitted in NICU which is comparable with the study of Patil *et al*. where NICU admission was 36% [25]. Our study shows less NICU admission compared with the study of Hassan *et al*. (65.3%) [29].

Our study has some limitations. Due to incomplete documentation and inappropriate chart keeping, some important outcome indicators were not included in the study. The sample size of this study was small.

Conclusion

Most common cause of PPROM was unknown. Most common maternal morbidity was puerperal fever and neonatal morbidity was respiratory distress. Maternal and fetal morbidity increases with increase in duration between rupture of membranes and delivery of fetus, so augmentation of labour should be done. In our study most common cause of cesarean was previous cesarean.

References

1. Ladfors L. Prelabour rupture of the membranes at or near term. Clinical and epidemiological studies, 1998 [cited 2020 July10]; Available from: https://gupea.ub.gu.se/handle/2077/12395.
2. Duff P. Premature rupture of membranes in term patients: induction of labor versus expectant management. Clin Obstet Gynecol. 1998;41:883-891.
3. Denney MJ, Cuhane FJ, Goldenberg LR. Prevention of preterm birth. Women Health. 2008;4:625-38.
4. Morris JM, Roberts CL, Crowther CA, Buchanan Sl, Henderson Smart DJ, Salkeld G. Protocol for the immediate delivery versus expectant care of woman with preterm prelaboure rupture of the membranes close to term (PPROMT) trail. BMC Pregnancy Childbirth. 2006;6:9.
5. Smith G, Rafuse C, Anand N, Brenanan B, Connors G, Crane J, *et al*. Prevalence, management and outcomes of preterm prelabour rupture of the membranes of women in Canada. J Obstet Gynecol Can. 2005;27:547-53.
6. Tahir S, Aleem M, Aziz R. Incidence and outcome of preterm premature rupture of membranes. Pak J Med Sci. 2002;18(1):26-32.
7. Ghazi A, Jabbar S, Siddiq MH. Preterm labour- still a challenge. Pak J Surg. 2006;22:222-6.
8. Liu J, Feng Z-C, Wu J. The incidence rate of premature rupture of membranes and its infl uence on fetal-neonatal health: a report from mainland China. J Trop Pediatr 2010;56:36–42.
9. Wu J, Liu J, Feng Z, Huang J, Wu G. Influence of premature rupture of membranes on neonatal health. Zhonghua Er Ke Za Zhi Chin J Pediatr 2009;47 452–456.
10. Velemínský M, Sák P. Management of pregnancy with premature rupture of membranes (PROM). Available from: medportal.ge/ eml/publichealth/2006/n2/11.
11. ACOG Committee on Practice Bulletins-Obstetrics. ACOG Practice Bulletin No. 80: premature rupture of membranes. Clinical management guidelines for obstetrician-gynecologists. Obstet Gynecol 2007;109:1007-1019.
12. El-Messidi A, Cameron A. Diagnosis of premature rupture of membranes: inspiration from the past and insights for the

future. J Obstet Gynaecol Can 2010;32:561–569.
13. Vogel JP, Lee AC, Souza JP. Maternal morbidity and preterm birth in 22 low- and middle-income countries: a secondary analysis of the WHO Global Survey dataset. BMC Pregnancy Childbirth 2014;14:56.
14. Beck S, Wojdyla D, Say L, Bertran AP, Merialdi M, Requejo JH, *et al*. The worldwide incidence of preterm birth: a systematic review of maternal morbidity and mortality. Bull World Health Organ 2010;88:31–38.
15. Agency CS, Ababa A. Ethiopia Demographic and Health Survey. 2012;(March). Available from: https://dhsprogram.com/pubs/pdf/ FR255/FR255.pdf
16. Naeye R, Peters E. Causes and consequences of premature rupture of fetal membranes. Lancet 1980;1:192–194.
17. Moore RM, Mansour JM, Redline RW, Mercer BM, Moore JJ. The physiology of fetal membrane rupture: insight gained from the determination of physical properties. Placenta 2006;27:1037–1051.
18. Mercer BM, Goldenberg RL, Meis PJ, Moawad AH, Shellhaas C, Das A, *et al*. The Preterm Prediction Study: prediction of preterm premature rupture of membranes through clinical findings and ancillary testing. The National Institute of Child Health and Human Development Maternal-Fetal Medicine Units Network. Am J Obstet Gynecol 2000;183:738–745.
19. Mercer BM. Preterm premature rupture of the membranes. Obstet Gynecol 2005;101:178–193.
20. Hackenhaar AA, Albernaz EP, da Fonseca TM. Preterm premature rupture of the fetal membranes: association with sociodemographic factors and maternal genitourinary infections. J Pediatr (Rio J) 2014;90:197–202.
21. Maberry MC, Gilkstropic, Bawdon RE *et al*. Anaerobic coverage for intra amniotic infection. Maternal & Perinatal impact. Am. J Perinatal 1991;8:338,
22. Mercer BM, Crocker L, Beon *et al*. Induction versus expectant management in premature rupture of the membranes with mature amniotic fluid at 32 to 36 weeks: a randomized trial. Am. J Obst. Gyne. 1993;82:775-82.
23. Arij Faksh, Joseph R. Wax, F. Leelucas, Angelina Castina, Michael G. Pinette. Preterm premature rupture of membranes ≥32weeks' gestation: impact of revised practice guidelines American Journal of Obstetrics and Gynecology 2011 Oct;205(4):340e1-340e5.
24. Joelle M. Lieman, Cynthio G. Brunfield, Walderman Carlo, Patrick S. Ramsey. Preterm premature rupture of membranes: Is there an optimal gestational age for delivery? ACOG, 2005, 105(1).
25. Patil S, Patil V. Maternal and foetal outcome in premature rupture of membranes. IOSR J Dent Med Sci. 2014;13(12):56-81.
26. Diraviyam JMV, Karunakaran L. Maternal and perinatal outcome in preterm premature rupture of membranes. Int J Reprod Contracept Obstet Gynecol. 2017;6:2498-502.
27. Surayapalem S, Cooly V, Salicheemala B. A study on maternal and perinatal outcome in premature rupture of membranes at term. Int J Reprod Contracept Obstet Gynecol. 2017;6:5368-72.
28. Choudhari P, Chhabra S, Kiyawat V. Evaluation of results of titanium elastic nailing system in paediatric lower extremity fractures of long bones. J Evol Med Dent Sci. 2014;3(72):15303-10.
29. Boskabadi H, Maamouri G, Mafinejad S. Neonatal complications related with prolonged rupture of membranes. Maced J Med Sci. 2011;4(1):93-8.