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Feto-Maternal outcome complicated by PROM, a peripheral hospital experience

KEYWORDS: PROM, LSCS, Primigravida, Multigravida

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ABSTRACT

The membrane surrounding the amniotic cavity are composed of the amnion and chorion and they are closely adherent to each other. These mebranes retain amniotic fluid and protect the fetus against ascending infection from genital tract. Most of the patient membrane rupture during process of labour but if it ruptures before onset of labour, it is called PROM. If PROM ocurres before 37 weeks of pregnancy it is called PPROM . Despite all measures PROM and PPROM continues to be important obstetrical complications. At term, nearly 8-10 % patients present with PROM and these patients are at increased risk for intrauterine infection when time interval between rupture of membrane and delivery increases. PPROM occurs in approximately 1 percent of all pregnancies and is associated with preterm deliveries. PPROM is a leading cause of preterm deliveries and causes complications like respiratory distress syndrome, neonatal infection and intraventricular haemrrhage.

This study was aimed to understand incidence, and neonatal and maternal outcome due to PROM. Premature rupture of membranes (PROM) remains a subject of great clinical relevance and intense interest and is day to day problem for each and every obstetrician. Despite exhaustive research, most aspects of PROM remain enigmatic. The mechanism of PROM is unknown, there is no standard method of diagnosis and most of the management plans are controversial. PROM is a leading cause for prematurity which leads to increased perinatal morbidity and mortality. As prevention of PROM is difficult so obstetrician can only try to reduce the complications of PROM. Final aim of obstetrician is a pregnancy that results in healthy infant with lesser maternal complications.

Methods: This is a retrospective study. The aim and objective is to determine the incidence, to find out the age, parity and gestational age distribution of PROM and was also to evaluate maternal and fetal outcome. The cases selected in this study were those booked patients who had spontaneous rupture of membranes after 28 wks of gestation but before the onset of labour pain. Patients were admitted in labour room from casualty as a routine. Total number of deliveries during study period were 2200 and total number of PROM cases were 137. Per-scepulum examination were done in all patients with history of leaking per vaginum to diagnose PROM. In doubtful cases a closed observation was done to diagnose PROM Patients were examined, investigated and treated as per hospital protocol. Broad spectrum antibiotics was started in these patients and were monitored for infections by laboratory investigations and clinical signs. Timing of delivery was decided depending upon gestational age and aim was to deliver a healthy infant with less traumatized mother. Inj dexamethasone four doses at interval of 12 hrs was given to preterm patients and pregnancy tried to continue minimum till 34 weeks of gestation under strict observation for chorioamnionitis.

Pre-induction bishop score was noted. Presence or absence of membranes were noted during examination. After confirmation of diagnosis and if decision was made for delivery then PGE2 gel application was done. All patients were assessed 6 hrs and 12 hrs after gel application and induction was done with oxytocin on appropriate time. Observation was made regarding mode of delivery. The babies were observed just after birth; Apgar score was recorded at 1 and 5 minutes. Babies were examined for maturity and for any congenital anamoley and followed. All the mothers were strictly observed for any signs of infections in puerperium.

Introduction:

Preterm delivery occurs in approximately 12% of all births in the United States and is a major factor that contributes to perinatal morbidity and mortality (1,2). Preterm premature rupture of membranes (PROM) complicates approximately 3% of all pregnancies in the United States. The optimal approach to clinical assessment and treatment of women with term and preterm PROM remains controversial. Management hinges on knowledge of gestational age and evaluation of the relative risks of delivery versus the risks of expectant management (eg, infection, abruptio placentae, and umbilical cord prolapse).

PROM is defined as leakage of amniotic fluid through ruptured chorioamniotic membranes which occur before onset of labour pain at any gestational age (3). This is one of the commonest problem in obstetrics and affects 10-20% of all pregnancies (4). PROM adversely affects pregnancy like preterm delivery and high rates of maternal morbidity and accounts for 70% perinatal mortality worldwide (5,6). Main and final mechanisms of membrane rupture is disturbances in collagen metabolism because it develops amniotic membrane's mechanical integrity and stress tolerance (7). It has been reported that prematurely ruptured membranes have less collagen content and hence less tension resistance (8). The compact layer of stromal matrix forms the main fibrous integrity of the amniotic membrane. The collagen contents are secreted by mesenchymal cells in the fibroblast layer. Interstitial collagens (types I and III) predominate and form parallel bundles that maintain the mechanical integrity of amniotic membrane.

Prolonged PROM refers to PROM > 24 hrs and is associated with increased risk of ascending infection (9). The time interval between the rupture of membranes and onset of labour pain is called latent period and the time interval between the rupture of membrane and delivery is called interval period.

Open membranes provide a path for bacteria to enter the uterus and puts both the mother and fetus at risk for life-threatening infection. Low levels of fluid around the fetus also increase the risk of the umbilical cord compression and can interfere with lung maturation in early pregnancy. (10)

Women who experience premature rupture of membranes should be evaluated promptly in the hospital to determine if a rupture of membranes has indeed occurred, and to be treated appropriately to avoid infection and maternal-fetal complications.

Chorioamnionitis, a known complication of PROM, is a bacterial infection of the fetal membranes, which can be life-threatening to both mother and fetus. Women with PROM at any age are at high risk of infection. Women are checked often (usually every 4 hours) for signs of infection: fever (> 38°C/100.5°F), uterine tenderness, maternal tachycardia (>100 beats per minute), fetal tachycardia (>160 beats per minute), or foul smelling amniotic fluid (11). Elevated TLC are not a good way to predict infection because they are normally high in labor. If infection is suspected, induction of labor is started at any gestational age and broad spectrum antibiotics are given. LSCS should not be automatically done in cases of infection, and should only be reserved for the usual fetal emergencies.

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Management of PROM: Summary by fetal age (12)

	Fetal age	Management
Term	>37 weeks	1-Induction of labor 2-Antibiotics if needed to prevent GBS transmission
Late Preterm	34-36 weeks	Same as for term
Preterm	24-33 weeks	1-Watchful waiting (expectant management) 2-Tocolytics to prevent the beginning of labour 3-One time dose of corticosteroids before 34 weeks
Pre-viable	<24 weeks	1-Patient counselling about watchful waiting or induction of labor 2-Latency antibiotics, corticosteroids, tocolysis, or MgSO4

Role of antibiotics in PROM-Revised guidelines from the Centers for Disease Control and Prevention (CDC) recommend that women with preterm PROM who are not in labor should receive intravenous group B streptococcus (GBS) coverage for at least the first 48 hours of preterm PROM latency prophylaxis, until the GBS test results obtained on admission are available (13). However, GBS test results should not affect the duration of antibiotic therapy. If the patient completes the full 7-day course of antibiotic prophylaxis has no evidence of infection or labor, intrapartum GBS prophylaxis can be managed based on the results of the baseline GBS test at the time of preterm PROM, unless 5 weeks have passed. This is because a negative GBS test result is considered valid for 5 weeks (14 15).

Dexamethasone use in PROM -Current ACOG recommendations (16,17)

A single course of corticosteroids is recommended for pregnant women 24-34 weeks' gestation who are at risk of preterm delivery within 7 days and as early as 23 weeks if delivery is imminent. A single rescue course of antenatal corticosteroids may be considered if the antecedent treatment was given more than 2 weeks prior, the gestational age is less than 32 6/7 weeks, and the woman is judged by the clinician to be likely to give birth within the next week. However, regularly scheduled repeat courses or more than 2 courses are not recommended. Further research regarding the risks and benefits, optimal dose, and timing of a single rescue course of steroid treatment is needed.

Results:

Total no of PROM cases was 137 in two yrs in the same hospital. Total no deliveries took place was 2200 in same time duration so incidence of PROM was 6.22%. Table 1 shows age distribution of PROM and max number of cases in between 22-24 yrs. (n=53, 38.68%). Our data concluded that PROM was more common in Primigravida (n=82,59.85%) (table 2).

Table 3 shows gestational period distribution and in our study PROM commonly occurs 36 weeks and onwards and term PROM was 62.04%. The most common presentation in PROM was cephalic presentation (89.78%) (Table 5). Out of 137 PROM patients 40 (29.19%)underwent LSCS(Table6) and 72.5 % LSCS done in primigravida. Most of lscs done in liew of fetal distress, failed induction and malpresentaions (Table 7). Only one patient had cord prolapse who underwent LSCS, which accounts 2.5% of total LSCS.

Out of 137 neonates 14(10.21%) has been admitted for more than a week and two neonates (1.45%) developed sepsis and one (0.73%) required ventilator support who died later because of prematurity and RDS. Two mother developed pain abdomen and fever in early puerperium who responded well after appropriate antibiotics.

Discussion:

The incidence of PROM in present study is 6.22%. This is similar observation by Alexander JM, Cox SM et al in 1996 and Duff P in 1996 (Alexander and Cox, 1996; Duff, 1996) (18,19). In our study PROM observed common in Primigravida (59.85%) differing our study by Bianco et al in 1996 who observed it more common in multigravida (20). In rural area because of unhygienic conditions, there are more chances of infection, which is an independent risk factor for PROM (21). Lower socio-economic condition also predisposes to malnutrition. The maximum incidence of PROM was between age group off 21-29 years, being highest in 21-25-year group. It was evident that no age was immune for PROM. The apparent higher incidence of PROM in age group 21-25 years was due to fact that our patients complete their child bearing in 3 rd decade.

Incidence of Caesarean section in our study is 29.19%, which differ to the studies conducted by Chua S, Arulkumaran S et al in 1991 who have found incidence of CS 19.1%(22), may be more number of PROM cases require to compare for LSCS.

Conclusion:

PROM before 37 completed weeks causing preterm labour is important cause of prematurity hence while managing a case of PROM chance of prematurity should be kept in mind but simultaneously if pregnancy continued for fetal salvage maternal risk like chorioamnionitis which is important cause of DIC to be seriously thought of.

As the etiology of PROM remains obscure, so prevention is difficult and so obstetrician has to concentrate more on its management which gives less maternal –fetal morbidity. The final aim of obstetrics is a pregnancy that results in healthy infant and minimal maternal morbidity. Women who are given aggressive management have less chances of chorioamnionitis, neonatal infection and morbidity and thus less hospital stay. Nowdays availibiliity of broad spectrum antibiotics decreased the maternal infection and morbidity due to PROM. Maternal morbidity increases when time interval between PROM and delivery increases. It would appear that the optimal condition for perinatal survival in a pregnancy complicated by PROM would be a gestational age more than 34 weeks and a latent period less than 24 hrs in absence of any infection. Therefore, the delivery should be planned keeping gestational age in mind with strict maternal –fetal surveillance. Perinatal mortality, neonatal morbidity increases by PROM due to prematurity. Having a premature infant puts immense burden on the parents as well as affects economy and health care resources of the country. Therefore, high risk patients for PROM shoud be identified and should be managed before they develop PROM. A proposed plan of "Aggressive management" irrespective of term of gestation is final answer to decrease maternal and neonatal morbidity and mortality (23).

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Table1: Age distribution of PROM

Age in yrs	No of cases
20-24	53
25-29	45
30-34	30
35 and above	09

Table2: Parity distribution of PROM

Gravida	No of cases	Percentage (%)
Primigravida	82	59.85
2 nd gravida	42	30.65
3rd gravida	13	9.48

Table3: Gestational period distribution

Gestational age(wks)	No of cases	Percentage (%)
28-30	04	2.91
31-32	08	5.82

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33-34	18	13.13
35-36	22	16.05
37 and above	85	62.04

Table 4: Term and Preterm gestation

Gestational age(weeks)	No of cases	Percentage (%)
Preterm (before 37 week of gestation)	52	37.96
Term ((after 37 week of gestation)	85	62.04

Table5: Fetal presentations

Presentations	No of pregnancies	Percentage (%)
Cephalic	123	89.78
Breech	11	8.02
Transverse	03	2.18

Table6: Caesarean in relation to parity

Gravida	No of cases	Percentage (%)
Primigravida	29	72.5
Multigravida	11	27.5

Table 7: Indication of Caesarean section

Indication	No of cases	Percentage (%)
Fetal distress	12	30
Malpresentation	14	35
Failed Induction	06	15
Severe Oligohydramnios	04	10
Post LSCS	03	7.5
Cord prolapse	01	2.5

Table 8: Neonatal outcomes

Neonatal outcome	No of neonates	Percentage (%)
Birth weight less than 2.0 kg	07	5.10
Neonatal hospitalization more than a week	14	10.21
Apgar score less than 7 at 1 minute	08	5.84
Apgar score less than 7 at 5 minutes	02	1.45
Neonatal sepsis	02	1.45
Ventilatory assistance	01	0.73
Neonatal death (Prematurity with RDS)	01	0.73

References:

1. Martin JA, Hamilton BE, Ventura SJ, Osterman MJ, Wilson EC, Mathews TJ. Births: final data for 2010. Natl Vital Stat Rep 2012;61(1):1-71. (Level II-3)
2. Mathews TJ, MacDorman MF. Infant mortality statistics from the 2006 period linked birth/infant death data set. Nat Vital Stat Rep 2010;58:1-31. (Level II-3)
3. Siega A, Promislow J, Savitz D, Thorp J, McDonald T. Vitamin C intake and the risk of preterm delivery." American journal of obstetrics and gynecology. 2003;189(2):519-25.
4. Cunningham F, Leveno K, Bloom S, Hauth J, Rouse D, Spong CY. Management of preterm labor. In: Williams obstetrics, 23th ed.; MC Graw Hill, New York, USA. 2010;232-47
5. Medina T, Hill D. Preterm premature rupture of membranes: Diagnosis and management. Am Fam. Physician. 2006,73: 659-66.
6. Mercer B. Premature rupture of the membrane. In: Complicated Pregnancy, 4th ed. Informa health care: London. 2007;713-27
7. Goldenberg R, Culhane J, Iams J, Romero R. Epidemiology and causes of preterm birth." Lancet. 371(9606):75-84.
8. Tejero E, Perichart O, Pfeffer F, Casanueva E, Vadillo-Ortega F. Collagen synthesis during pregnancy, vitamin C availability, and risk of premature rupture of fetal membranes. Int J Gynaecol Obstet. 2003;81(1):29-34.
9. ACOG Committee Practice Bulletins (2007). Obstetrics, ACOG Practice Bulletin No 80: Premature rupture of membranes. Clinical management and guidelines for obstetrician and gynecologist. Obstet Gynecol 2007; 109: 1007-1019
10. ^ Jump up to: a b c Mackeen, AD; Seibel-Seamon, J; Muhammad, J; Baxter, JK; Berghella, V (27 February 2014). "Tocolytics for preterm premature rupture of membranes.". The Cochrane database of systematic reviews. 2: CD007062. doi:10.1002/14651858.CD007062.pub3. PMID 24578236.
11. ^ Jump up to: a b c d e f g h i j k l m n o Cunningham, F (2014). Williams Obstetrics. New York: McGraw-Hill Education. pp. Chapter 23: Abnormal Labor. ISBN 978-0071798938.
12. Jump up to: a b c d e f g h i j k l m n o p q r s t u v w x y z aa ab ac ad ae af ag ah ai "Practice Bulletins No. 139". Obstetrics & Gynecology. 122 (4): 918–930. October 2013. doi:10.1097/01.AOG.0000435415.21944.8f. PMID 24084566. Retrieved 12 November 2014.
13. ACOG. Practice bulletin no. 120: use of prophylactic antibiotics in labor and delivery. Obstet Gynecol. 2011 Jun. 117(6):1472-83. [Medline].
14. Verani JR, McGee L, Schrag SJ. Prevention of perinatal group B streptococcal disease--revised guidelines from CDC, 2010. MMWR Recomm Rep. 2010 Nov 19. 59:1-36. [Medline].
15. ACOG. ACOG Committee Opinion No. 485: Prevention of early-onset group B streptococcal disease in newborns. Obstet Gynecol. 2011 Apr. 117(4):1019-27. [Medline].
16. ACOG Committee Opinion No. 475: Antenatal corticosteroid therapy for fetal maturation. Obstet Gynecol. 2011 Feb. 117(2 Pt 1):422-4. [Medline].
17. Practice Bulletin No. 160: Premature Rupture of Membranes. Obstet Gynecol. 2016 Jan. 127 (1):e39-51. [Medline].
18. Alexander JM, Cox SM (1996). Clinical course of premature rupture of membranes. Semin Perinatol 1996; 20: 369-374
19. Duff P (1996). Premature rupture of membranes in term patients. Semin Perinatol. 1996; 20: 401-408
20. Bianco A, Stone J, Lynch L, Lapinsh R, Berkowitz G, Berkowitz RL (1996). Pregnancy outcome of age 40 and older. Obstet. Gynecol. 1996; 87: 917-922
21. Minkoff H, Grunebaum AN, Schwarz RH, Feldman J, Cummings M, Crombleholme W, Clark L, Pringle G,McCormack WM Risk factors for prematurity and premature rupture of membranes: a prospective study of the vaginal flora in pregnancy.(PMID:6391179)American Journal of Obstetrics and Gynecology [1984, 150(8):965-72]
22. Chua S, Arulkumaran S, Karup A, Anandakumar C, Tay D, Ratnam SS (1991). Does prostaglandin confer significant advantages over oxytocin infusion for nulliparous prelabour rupture of membranes at term ? Obstet Gynecol 1991; 77: 664-667
23. Naef RW, Albert JR, Ross EL, Weber BM, Martin RW, Morrison JC, Premature rupture of membranes at 34 to 37 weeks' gestation: Aggressive versus conservative management. American Journal of Obstetrics and Gynecology, Volume 178, Issue 1, Pages 126-130