



A Prospective Study Of Maternal And Fetal Outcome In Premature Rupture Of The Membranes

¹Dr. Ritu Kumari, ²Dr. Rajrani Choudhary, ³Dr. Abhilasha Shandilya

¹Senior Resident, ²Associate Professor, ³Assistant Professor,
Department of Obstetrics and Gynaecology, NMCH, Patna

***Corresponding Author:**

Dr. Ritu Kumari

M.B.B.S., MS, Senior Resident, Department of Obstetrics & Gynaecology N.M.C.H., Patna

Type of Publication: Original Research Paper

Conflicts of Interest: Nil

Abstract

Background:

Premature rupture of membrane (PROM) is the rupture of fetal membrane before onset of labour - PROM is associated with significant maternal fetal & neonatal risk. It is a challenge to the obstetrician to end this untoward event into an acceptable outcome for the fetus & for the mother as for as possible.

Materials & Method:

This was a prospective study done at NMCH Obstetrics & Gynaecology department, Patna in between March 2020 to August 2021. 100 pregnant patient of 28 weeks to 40 weeks of gestation having PROM were selected & study of maternal and fetal outcome in reference to chorioamnionitis, duration of latent period, mode of delivery operative interference & fetal risk were studied.

Result:

Most cases of PROM occurred beyond term (28%) 41.66% of term PROM had spontaneous onset of labour. Elective caesarian section was higher in PPRM. Incidence of chorioamnionitis in PROM was 9%, puerprial sepsis (13%), Nicu admission rate is 44.64%, mainly due to prematurity and intrauterine infection.

Conclusion: PROM is associated with significant maternal, fetal & neonatal risk. Management strategies of PROM are diverse and needs balance between maternal risk & prematurity of neonates.

Keywords: NIL

Introduction

Premature rupture of membrane (PROM) is the rupture of the fetal membrane before the onset of labour when membrane rupture occurs before 37 weeks of gestation it is known as preterm premature rupture of the membranes (PPROM). PROM occurs in approximately 10% of all pregnancies and PPRM in 2% of all pregnancies. PROM is associated with significant maternal, fetal & neonatal risks. Maternal complication of PROM includes chorioamnionitis, post partum infections morbidity (2-13%), placental abruption (4-1%) & psychological upset.

The overall risk of chorioamnionitis after PROM is approx 20-30%. The risk is inversely related to the gestational age at the time of the rupture.

The maternal intrapartum consequences of PROM are related to the induction of labour. Latent period tends to vary with the gestational maturity. A study at the university of California in Los Angeles (ULCA) had found that labour started within 24 hrs. of PROM in 81% of patient. In preterm gestation however labour begins within 24 hours of PROM in only 48% of cases.

Fetal complication of PROM includes prematurity leading to respiratory distress syndrome, necrotising

enterocolitis, sepsis including 1-2% risk of fetal death, on long term these babies may fail to thrive.

The oligohydramnios resulting from PROM particularly if it is preterm and prolonged may cause the neonatal “oligohydramnios tetrad” of flattened facies, limb positional deformities, pulmonary hypoplasia and impaired fetal growth. Feared sequel of PROM is pulmonary hypoplasia.

There are several risk factor associated with PROM like nutritional deficiency of ascorbic acid, copper, zinc, iron, smoking and cocaine abuse also plays a role. Reproductive tract infection leading to decrease collagen content of membrane predispose patient to PROM.

The recurrence risk of PROM range between 20% to 30%.

The diagnosis of PROM requires detailed history, clinical examination & certain laboratory test like Nitrogen blue test, Ultrasound evaluation of amniotic fluid volume, microscopic examination to detect fetal cell and orange cell on Nile blue sulphate test.

Management of PROM continues to be a challenge even in present day obstetrics. The main concern is to balance the risk of infection in expectant management versus the risk of prematurity and its consequences and inevitable increase in operative interference in active intervention.

Aims & Objectives

To study maternal outcomes in reference to -

1. Duration of latent period.
2. Chorioamnionitis.
3. Placental abruption.
4. Mode of delivery.
5. Post partum hemorrhage.
6. Puerperal sepsis. The overall incidence of each parameter in PROM, preterm PROM and in PROM beyond term were studied.
7. To study fetal outcome in reference to fetal distress & birth weight leading to NICU admission, and perinatal death.

Materials & Method

1. Study design - Prospective epidemiological study.

2. Study area - The department of Obstetrics & Gynaecology, Nalanda Medical College & Hospital, Patna.
3. Study period - March 2020 - August 2021.
4. Sample size - 100
5. Study population - Study population was composed of pregnant mothers of 28 weeks to 40 weeks of gestation who were admitted with PROM through antenatal out patient department and casualty.
6. Parameters to be studied.

Maternal outcomes were studied in reference to chorioamnionitis - by clinical and microbiological examinations, incidence of placental abruption, duration of latent period mode of delivery & operative interference, postpartum hemorrhage and puerperal sepsis.

Fetal outcome were studied in reference to cord prolapse, abnormal CTG, birth weight, birth asphyxia, RDS, neonatal sepsis neonatal jaundice, NICU admission rate and perinatal death.

Methodology : PROM cases attending antenatal outpatient clinic and casualty were examined by proper history taking and clinical examination. There was history of gush of watery fluid through vagina or persistent wetness. Other relevant history like duration of the membrane rupture, number of internal examinations after water break were also noted.

Examination : Speculum examination after taking proper antiseptic & aseptic care. Speculum examination done. Amniotic fluid was found present in the posterior vaginal fornix. If fluid pool was present, the patient was asked to cough and amniotic fluid was seen escaping through cervical OS. Odour, meconium staining etc. were also looked for. Cord prolapse was excluded. Fluid for laboratory test was collected over blade of the speculum before it comes into contact with the vaginal wall.

Nitragine Test : PH of draining fluid was determined with the help of a nitragine paper. The colour of the paper turned blue from yellow.

Slide & Microscopy : Slide prepared from vaginal pool of fluid and air dried and examined under microscope to detect ferning pattern.

Inclusion Criteria :

1. Gestational period 28-40 weeks

2. Singleton, live fetus
3. Primigravida or multigravida

Exclusion Criteria :

1. Multiple pregnancy
2. Polyhydramios
3. Congenital malformation
4. Antepartum hemorrhage
5. Gestational & pregestational diabetes mellitus
6. Heart disease in pregnancy

A total of 100 PROM cases including 36 PPRM case were enrolled for the study.

Informed consent were taken from the participants. Maternal pulse, temperature, blood pressure, presence of uterine tenderness foul smelling vaginal discharge were noted.

1. Relevant investigation like high vaginal swab for culture & sensitivity.

2. Amniotic fluid from vaginal pool for smear and gram stain and culture & sensitivity.
3. USG for amniotic fluid vol & index. Placental abruption fetal biophysical profile
4. CBC
5. C-reactive protein
6. CTG was done on admission & again repeated during active phase of labor.
7. Delivery was indicated in presence of labour, infection & fetal distress.
8. Induction & vaginal delivery was attempted in vertex presentation favourable cervix , clear liquor & good fetal condition. Otherwise lower segment caesarean section was performed.
9. Babies were kept in close supervision of the neonetologist to detect development of respiratory distress syndrome, hypoglycemia, hypothemia, jaundice & sepsis.

Observation and Results

Table-1 : Distribution of PROM cases in study population in relation to period of gestation PROM & PPRM

Types of PROM	Number of cases	Percentage
PROM cases	64	64%
Preterm PROM cases	36	36%

So, the incidence of PROM was 64% and the incidence of PPRM was 36%.

Table-2 : Relation of PROM with parity in study population

	PROM n=64	%	PPROM n=36	%
Primigravida	16	16%	9	9%
Multigravida	48	48%	27	27%

Table-3 : Incidence of pregnancy out comes in PROM & its relation with the period of gestation (term PROM & PPRM)

Type of PROM	No. of cases	Spontaneous	Induced labour(%)	Elective labour L.S.C.S.
PROM	64	26 (41.66%)	30 (48.14%)	8 (10.18%)
PPROM	36	10 (30%)	20 (56.4%)	6 (3.33%)

Thus among total 100 patients of PROM 37.5% cases had spontaneous labor, 51.19% cases had induced labour & 11.31% cases had elective L.S.C.S.

Table-4 : Incidence of chorioamnionitis.

Type of PROM	No. of cases	%
PROM cases n=64	4	6.25%
PPROM cases n=36	5	13.8%
Total PROM + PPRM cases n=100	9	9%

So, the overall incidence in PROM is 9%.

1. Incidence of placental abruption in PROM being 4.76% & PPH incidence is 11.3%.
2. Puerperal sepsis occurs in 13% of PROM cases.

Table - Incidence of fetal outcome & Neonatal Morbidities (including perinatal death)

Nature of morbidity	Term PROM with % n=64	PPROM with % n=36	Total PROM cases with % n=100
Cord prolapse	1(2.78%)	2(5%)	3(3.57%)
Abnormal fetal CTG	9(13.89%)	6(18.33%)	15(15.48%)
Low birth wt. (<2.5 kg)	4(6.48%)	28(78.33%)	32(32.14%)
Birth asphyxia	14(21.19%)	9(26.67%)	23(23.21%)
RDS	2(2.78%)	10(30%)	12(12.5%)
Neonatal sepsis	3(5.55%)	8(21.67%)	11(11.31%)
Neonatal Jaundice	11(16.67%)	17(48.33%)	28(27.98%)
NICU admission	16(25%)	29(80%)	45(44.64%)
Perinatal death	0	1(3.33%)	1(1.19%)

Discussion

The table-1 shows that in my study most cases of PROM occurred beyond term ie 37 completed weeks (28%). Several studies including Cox SM (1988) et al clinical information services, South Australia 1995 reported the higher incidence of PROM cases beyond term. The incidence of PROM is 48% in multigravida & 16% in primigravida.

Table-2 shows 41.66% of term PROM had spontaneous onset of labour, 48.14% labour had to be induced & 10.18% cases underwent elective LSCS. Elective caesarean section rate was also higher in PPRM cases (13.33%) than term PROM cases mainly due to higher prevalence of malpresentations, unfavourable cervix & fetal distress.

The overall incidence of chorioamnionitis in PROM was 9% Arias F (2004)47 also stated that the overall risk of chorioamnionitis after PROM is approx 20%.

Incidence of puerperal sepsis in PROM was 13%. In vaginal delivery it was 7.04%. While in caesarean section the incidence was 27.58%.

The overall incidence of cord prolapse in PROM is 3.57% Krishnan U (2001) et al stated that frank or occult cord prolapse occur most commonly with PROM.

The incidence of abnormal fetal CTG tracing is 13.89% in term PROM cases and 18.33% in PPRM cases. The most common abnormality being variable deceleration due to cord compression.

The incidence of low birth weight babies in PPRM cases is 78.33% and in term PROM it is 6.48%. Prematurity remains the most significant factor in the

increased perinatal morbidity & mortality associated with PPROM.

The data from the collaborative perinatal project shows that definite neonatal sepsis was 2% for infants larger than 2500 gm, 4.8% for infant between 2000 and 2500 gm & 20% for infants smaller than 2000 gms. NICU admission rate is 44.64% Weber C (2001) et al⁷⁷ stated that neonatal mortality & morbidity in PROM increases with decreasing gestational age.

Conclusion

PROM is associated with significant maternal fetal & neonatal risks. Management strategies of PROM are often diverse.

Duration of latent period of PROM is inversely related to duration of pregnancy.

Rate of operative deliveries including instrumental vaginal delivery and caesarean section were raised in PROM.

Incidence of chorioamnionitis is inversely related to the period of gestation.

Incidence of puerperal sepsis is approximately four times higher in caesarean section than vaginal

delivery. Neonatal morbidities & mortality in PROM are mainly the consequences of prematurity and intrauterine infection.

Reference

1. American College of Obstetricians & Gynaecologist : Clinical management guidelines for Obstetrics & Gynaecology. ACOG practice bulletin no. 1. Int. J. Gynaecol Obstet 1998; 63 : 75-84.
2. American College of Obstetricians and Gynecologist : PROM clinical management guidelines for Obstetrician-Gynecologist ACOG practice bulletin no. 80 Int. J. Gynecol Obstet 2007; 109 : 1007- 1019.
3. Alexander JM, Cox SM : Clinical causes of Premature Rupture of Membranes. Semim Perinatol 1996; 20 : 369-374.
4. Garite TJ, Freeman RK : Chorioamnionitis in the preterm gestation. Obstet Gynecol 1982; 59 : 539- 545.
5. Savitz DA, Ananth CV, Luther ER, Thorp JM : Influence of gestational age on the time from spontaneous rupture of the chorioamniotic membranes to the onset of labor. AM J Perinatal 1997; 14 : 129-133.