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Study of Incidence of Sepsis with Maternal and Foetal Outcomes in Premature Rupture of Membrane at Term

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ABSTRACT

Objective

obstetricians from the very ancient days were of the opinion that premature rupture of membranes can cause maternal complications, increases operative procedures and neonatal morbidity and mortality. The aim of this study is to see the maternal and fetal outcome in premature rupture of membranes at term and we studied the cases of PROM during and after delivery and studied common maternal and perinatal morbidities as well as mode of deliveries. To study the efficacy and safety of i.v. oxytocin infusion and vaginal mesoprostol PGE1 analog induction in patient of PROM at term and progress of labor.

Methods and material – *this is a prospective study where patients with confirmed PROM at term were recruited and monitored for progress of labor as well as mode of deliveries. And we can also study the effect of induction by i.v oxytocin and prostaglandin analog PGE1 in cases of PROM at term.*

Result- *the study period was of 6months with effect from 1ST dec. 2014 –31ST may 2015. The patients were admitted in labor room through emergency. Total no. of deliveries in study period were 910. Out of 910 patients 128 are of PROM.*

The incidence of PROM in this study 14% and the maximum no. of cases were in the age group of 20-25 years. PROM mainly occurs in primigravida and cephalic is the commonest presentation.

PROM is an obstetric emergency and if once PROM is diagnosed it is important that to weigh the risk of PROM and prompt and active management will improve the maternal and fetal outcome.

Induction by i.v. oxytocin and PGE1 analog comparable to each other however cesarean rate is slightly higher in PGE1 analog group.

Conclusion- *prompt diagnosis and active management of PROM cases at term is not only beneficial in improvement of maternal and fetal outcome but it also reduced the hospital expenses, stay and reduced chances of maternal and neonatal sepsis also.*

Keywords- *premature rupture of membrane, maternal and neonatal outcome.*

Introduction

Preterm labor or “premature” rupture of membranes (PROM), happens when your water breaks before the start of labor.

Premature rupture of membranes (PROM), which is defined as rupture of membranes before onset of labor, complicates around 5-10 % of pregnancies. At least 60% of cases of PROM occur at term. In spite of many studies available in the literature, the clinical management is surprisingly controversial in these cases. The concern with conservative management is the risk of infection to the mother and the fetus, whereas immediate induction can increase cesarean rate⁽¹⁾.

Despite advances in perinatal care, premature rupture of the membranes and preterm premature rupture of the membranes, continue to be the important obstetric complications. At term, 8 to 10 percent of pregnant women present with premature rupture of the membranes, these women are at increased risk for intrauterine infections, when the interval between the membrane rupture and delivery is prolonged⁽²⁾.

Most Indian studies from Mumbai report an incidence of PROM between 7% and 12%. Daftary and Desai (2006) reported that PROM occurs in 5-20 % of all pregnancies. Maternal mortality in PROM is mainly due to chorioamnionitis, Puerperal sepsis and septic shock. Abruptio Placenta, retained placenta, primary and secondary PPH and endomyometritis are also significant causes of maternal morbidity. Prolonged hospitalization without active intervention with uncertain fetal and neonatal prognosis lead to adverse psychosocial sequelae.

Increased operative interference associated with induction of labor account for significant proportion of puerperal maternal morbidity. Although the incidence of chorioamnionitis is 30%, the reported incidence of neonatal sepsis is only 2-4%. Neonatal morbidity will also be increased because of the mechanical difficulties encountered with delivery, either by vaginal or abdominal route due to reduced volume of amniotic fluid. In the event of non-induction of labor in PROM, there may be good uterine contractions but reduced amount of liquor causes failed progression and consequently dry labor followed by rupture uterus⁽³⁾.

The term PROM study showed that expectant management was associated with a significantly increased incidence of clinical chorioamnionitis, postpartum fever, and longer maternal hospital stay compared with labor induction, but there was no difference in neonatal infection rate and cesarean delivery rate. Therefore, induction of labor could be an efficient strategy to reduce infectious morbidity associated with term PROM. The use of antibiotics in PROM at term has been addressed in a Cochrane review in 2002, which included only two well-designed randomized trials by Cararach et al and by Ovalle et al. The author's conclusion is that routine antibiotics for term PROM reduces maternal infectious morbidity but have no neonatal benefits⁽⁴⁾.

Objectives is to study is the labor outcomes both maternal as well as fetal in patients who presented with premature rupture of membranes at term before the onset of labour.

To study the efficacy and safety of i.v. oxytocin infusion and vaginal mesoprostol PGE1 analog induction in patient of PROM at term.

Study conducted in the Bundelkhand medical college (BMC) and associated hospital Sagar (M.P.) from dec 2014 to may 2015. Out of 910 total number of deliveries during the period ,128 cases were of PROM patients at term admitted in the labor room of BMC SAGAR.

Materials And Methods -Study Groups:

Inclusion Criteria:

A. Women at term gestation (37-40) weeks having PROM irrespective of gravidity ,Gestational age assessment was done by

- i. LMP – Neagle’s formula
- ii. Ultrasound

Exclusion Criteria:

- a) Women less than 37 Weeks of gestation and more than 41 Weeks of gestation.
- b) Women with medical disorders.
- c) Women with obstetric high risk factors like Diabetes, Pregnancy induced hypertension, heart diseases complicating pregnancy, Antepartum haemorrhage etc.

Methods of study

All the patients coming with history of premature rupture of membranes before onset of labor pains were admitted to labour room. A detailed history was taken Age, parity, menstrual and obstetric history with special 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 os were evaluated. Detailed history regarding recent coitus, severe physical exertion and vaginal examinations if done any before admissions was noted. In general examination pulse, BP and temperature were noted followed by systemic examination. In obstetric examination uterine height, presentation, position, lie of fetus and amount of liquor were noted. All parameters of maternal and fetal well being were recorded.

A single pelvic examination was done to note the Bishop’s Score by 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 either of a penicillin group or a cephalosporin group, depending on the availability of the antibiotic in the hospital was given after sensitivity test. Thereafter the patient was monitored 4 hourly for signs of infections. A 4 hourly monitoring of pulse, BP, temperature and presence or absence of contractions was made whenever required. The same was carried out more frequently if required . Fetal heart sounds were recorded every ½ hour initially.

If the cervix is posterior in the vagina, thick, and closed, it should be considered “unfavorable.” If it is mid position to anterior within the vagina, moderately effaced, and approximately 2 cm dilated, it should be considered “favourable.”

Favorable cervix

If the patient’s cervix is favorable, little is to be gained by delay. Accordingly labor should be induced as soon as possible by administration of

intravenous oxytocin. Per Vaginal examinations should be minimized, especially during the latent phase of labor.

In case of Unfavourable cervix the induction is done by insertion of PGE1 analog mesoprostol tablet of 50 microgram in the posterior fornix of vagina and augmentation may be done by adding oxytocin drip .

In Oxytocin group: Dose of oxytocin used was 2.5 units for primigravidae and 1 unit for multigravidae ,in titrating doses starting from 10 drops/min, accelerating at the rate of 10 drops/min every half an hour.

In PGE1 analog 50 microgram of mesoprostol tablet inserted in posterior fornix of vagina and after 6 hours if cervix is favourable augmentation of labour can be done by adding oxytocin infusion, 2.5 units and if unfavourable 50 microgram tab of mesoprostol can be repeated. If the patient has leaking for more than 24 hours and pelvis is not adequate consider for taking cesarean section. And patient induced with either oxytocin or PGE1 analog any time showing sign of fetal distress or sign of non progress of labour to be considered for cesarian section⁽¹¹⁾.

Discussion

Premature rupture of membrane (PROM) at term is a common clinical problem, affecting roughly 8-10% of pregnant women. Spontaneous labor is expected to start within 24 hours of the rupture of fetal membranes in the majority of women.

Thus, early induction of labor can be initiated to reduce the risk of maternal infection and shorten

the delivery time in term pregnancies complicated with low Bishop Scores and PROM⁽⁵⁾.

Studies in the 1970s and 1980s reported higher rates of operative deliveries in women with term-PROM who were managed actively with induction of labor compared with expectant observation. The authors also concluded that women who were induced at any point of time had 6.8 times the odds of having a C-section compared to women who had expectant management⁽⁶⁾.

Although oxytocin is usually preferred to promote labor in term PROM, it was recently proposed that prostaglandins E1 and E2 can be administered vaginally to stimulate cervical ripening in term pregnancies complicated with low Bishop's Scores and PROM⁽⁵⁾.

Van der Walt and Venter subsequently assigned 60 uncomplicated term patients with an unfavorable cervix (Bishop's score 5) to three treatment groups: expectant management, immediate oxytocin induction, and intravaginal PGE₂ (two 0.5-mg tablets). The dose of prostaglandin was repeated every 6 hours up to a maximum of three doses. The mean duration of labor was longest in the oxytocin group, and all six cesarean deliveries were in these patients. There was no significant difference in the frequency of maternal or neonatal infection. Women in the prostaglandin group had the shortest length of hospitalization⁽⁷⁾.

Goeschen conducted a clinical trial comparing induction of labor with oxytocin versus PGE₂. He initially enrolled 60 women who were at 36 weeks' gestation or longer and had PROM and a

Bishop's score of 7 or less and assigned them to receive oxytocin ($n = 25$) or PGE₂ gel ($n = 35$). The gel was applied intra cervically in a dose of 0.4 mg. The interval from PROM to delivery and the duration of labor were significantly shorter in the PGE₂ group. In addition, the incidence of operative delivery and the frequency of neonatal infection were lower in the prostaglandin group⁽⁷⁾.

RESULT

In our study we include 128 patients which are admitted in labor room of associated hospitals of BMC Sagar at term pregnancy with PROM. Out of 128 patients, we further sub divided in 2 study groups in which maternal and fetal outcome were monitored. First group comprised of 31 patients (+ 17 patients from 2nd group who underwent cesarean section after failed induction) taken for cesarean sections for other associated obstetric indication along with PROM. Eg. Fetal distress, CPD.

Second group includes 97 patients with PROM who underwent induction either by oxytocin infusion or by prostaglandin analog mesoprost depending upon Bishop's score of cervix or favourability of cervix.

Patient who have favourable cervix were induced with oxytocin infusion and patient who have unfavourable cervix induced by prostaglandin analog tab mesoprost 50 microgram vaginally inserted in posterior fornex.

PARITY

In our study we find most of the patient are primigravida. Out of 114 patients 82 patients were

primigravida, that correlates with other studies of aktar et al .Chances of increased sexual activity and increased genital infections are most common among primigravida. In this study 71% were primigravida compared to control group

Study	% of primigravida
Akbar et al study	45%
Our study	71%

In our study the age distribution of the patient - For this study the cases were selected from all age groups. Maternal age group between 20 - 25 years was the most common age group. These findings correlated with study of Akter et al who found that 40.33% out of 300 cases of PROM belong to age group between 21- 25 years. In our study 49 cases were grouped between to 20 -25 yrs. These findings also correlates with our study finding 72% of primigravida.

Risk Factors In Relation To PROM

In the current study most common known risk factors were malpresentations (13%), and H/O recent coitus (10%), previous H/O PROM and UTI accounts for 6% each. In the study by Newton ER 31, 8% of patients gave H/O PROM during their previous pregnancy. They stated that genetic factors as well as possible vaginal/ cervical infections could be contributory factors for PROM. Increased incidence of PROM in breech presentation has been noted according to Gunn et al study⁽¹⁰⁾.

Mode of Delivery

out of 128 cases 62.5% had normal vaginal deliveries , 37.5% had cesarean sections and 32 %

patient(from 37.5%) underwent caeserian sections for various other obstetric indications ,mainly fetal distress and contracted pelvis. Our study findings correlated with chales PJ study with caeserian rate 58.7%⁽¹⁰⁾.

Maternal Morbidity

In our study 11% had puerperal pyrexia in comparison to control group which is 2%. And incidence of chorioamnionitis is 3% in study group⁽⁸⁾.

The strong link between the number of vaginal examinations and increased mother’s risk of chorioamnionitis has been confirmed in many studies. In 2004 Ezra et al found that 7 or more vaginal examinations were an important risk factor for infection in women with PROM⁽¹²⁾.

	Puerperal pyrexia	Chorioamnionitis
Artal k study	13%	3-13%
Our study	11%	3%

Neonatal Morbidity In our study of 128 cases, 26% of babies suffered from respiratory distress syndrome, 14% from septicemia and 3% from neonatal jaundice and conjunctivitis and 4% from intraventricular haemorrhage⁽⁹⁾.

	RDS	Septicemia
Mark H. Yudnic	48.7%	8.4%
S Akter	11.1%	6.7%
Nili & Sham	33.3%	5.5%
Present study	26%	14%

Heuback (1948) found that latent period is more important factor than gestational age for the risk of neonatal infections, similarly gestational age is more important factor for risk of RDS than latent period.

septicemia	Nili and Sham study	Present study
<24 hours	18.4%	20%
> 24hours-48 hours	15.3%	20%
> 72	-	33.3%

DISTRIBUTION OF BIRTH WEIGHT OF NEW BORN

Weight of new born in kg	No. of patient
1-2	10
2-3	82
3-4	36

INDICATION OF CESEAREAN SECTIONS IN PROM PATIENTS -

INDICATION	NO. OF PATIENT
Primi with CPD with PROM	18
Primi with fetal distress with PROM	7
PROM with oligohydramnios & anhydramnios	5
PROM with PIH	5
PROM with Abruoptio placenta	3
PROM with previous cesarean	7
PROM with previous two cesareans	1
PROM with NPOL with prolonged labor	4

Conclusion

We concluded in our study that cases of PROM needs active attention and active management. Active management is beneficial for better maternal and neonatal outcome to reduce maternal morbidity and perinatal mortality . But our main target was healthy mother and healthy baby. In managing PROM, timely use of proper antibiotics, steroids and induction or augmentation of labor, reduces hospital stay and ultimately reduces perinatal and maternal complications. From the

present study we concluded that if there are chance of maternal morbidity, pregnancy should be terminated, considering the maternal morbidity first then that of fetus as if tree should be saved first at the cost of its fruits.

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