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Prelabour Rupture Of Membrane:- Feto-Maternal Outcome in a Teaching Hospital.

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Abstracts

Background*:- Prelabour rupture of membrane is one of the most common complication of pregnancy, resulting in maternal and fetal complications. The incidence, maternal and fetal outcome depends on the period of gestation, the facilities available and timely management of complication.*

Methods*:- This study was conducted in a teaching hospital in Manipur, to find out the incidence, maternal and fetal outcome in pregnancies complicated by prelabour rupture of membrane.*

Results*:- The incidence of PROM during this period comes to 6.3%. Majority of the respondents belonged to the age group of 20-30 years in 70% of cases. Majority of the respondents were homemaker in 43.6% of cases. All respondents were literate. More than half of respondents were from lower middle socio-economic status (51.8%). Majority of the patients (50.9%) reported to hospital after 3 hours of drainage at the time of admission. More than half of the respondents (55.5%) were primigravidae and 90.9% of the patients were of gestational age ≥37weeks.*

Conclusion*:- Prelabour rupture of membranes (PROM) though common in term pregnancies, is not responsible for the increased maternal and neonatal morbidity in these women. The major identifiable risk factors include UTI, H/O PROM, lower genital tract infection and polyhydramnios. However, a vast majority of the risk factors were unknown in most cases. Nutritional deficiencies leading to deficit production of collagen ultimately leading to PROM has also been associated. Management of PROM for a successful outcome is still controversial. Aggressive management showed higher rates of caesarean section whereas conservative management increases risk of maternal infection. The present study favour conservative management for at least 12-24 hours with an outcome of no maternal morbidity and mortality, lesser neonatal complications due to administration of prophylactic antibiotics, antenatal corticosteroids.*

Keywords: *PROM, PPROM, PTL, maternal outcome, fetal outcome.*

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I. Introduction

Prelabour rupture of membranes (PROM) is defined as spontaneous rupture of the membranes any time beyond 28th week of pregnancy but before the onset of labour. When rupture of membranes occur beyond 37th week but before the onset of labour it is called term PROM and when it occurs before 37 completed weeks, it is called preterm PROM (PPROM).[1] The "latent period" is the interval between membrane rupture and the onset of active labour.[2]

The incidence of PROM is about 10% of all pregnancies and 70% of them occur at term.[3] At term, the onset of labour occurs within 24 hours after membrane rupture in 80% to 90% of patients. Among patients with PROM prior to term, latent periods occur longer. There is an inverse relationship between gestational age and the proportion of patients with latent periods longer than 3 days. For pregnancies between 28 and 32 weeks, 33% had latent periods longer than 3 days, whereas for pregnancies of 33 to 34 and 35 to 36 weeks, the corresponding values were 16% and 4.5% respectively.[4]

The normal development, structural integrity and function of the fetal membranes are essential for normal progress and outcome of pregnancy. In most pregnancies, labour begins at term in presence of intact fetal membranes. Without interventions their spontaneous rupture usually occurs near the end of the first stage of labour.[5]

The diagnosis of PROM is based on maternal history. Women with an uncertain history of prelabour rupture of the membranes should be offered a speculum examination to determine whether their membranes

have ruptured. Digital vaginal examination is to be avoided because it has been shown that a threefold increase of positive amniotic cultures occurs in women who had vaginal examinations compared to those who did not.[10]

Aims And Objects:-

The aims and objects of the study are:

1) To identify the risk factors of prelabour rupture of membranes.
2) To assess the fetal and maternal outcome of prelabour rupture of membranes.

II. Materials And Methods

Study set up:

This cross-sectional study was carried out in the Department of Obstetrics and Gynecology, JNIMS, Porompat. After excluding women with antepartum haemorrhage, uterine anomalies, intrauterine death and fetuses with congenital anomalies, patients with prelabour rupture of membranes were recruited in this study.

Study design:

Cross-sectional study design.

Study duration:

16 months.

Sample size:-

110 patients.

Inclusion criteria:

1. Both primi and multi gravid women who gave consent.
2. Pregnancy duration between 28-40 weeks.
3. H/O leaking or presence of leaking per vagina spontaneously.

Exclusion criteria:

1. Pregnant women with active labour.
2. Antepartum haemorrhage.
3. Uterine anomalies.
4. Intrauterine death.
5. Fetuses with congenital anomalies.

Analysis plan:

Data were entered in MS Excel and was later transferred to SPSSv22.

Ethical issues:

Ethical approval and permission to conduct the study was obtained from the Ethics Committee of the Institute

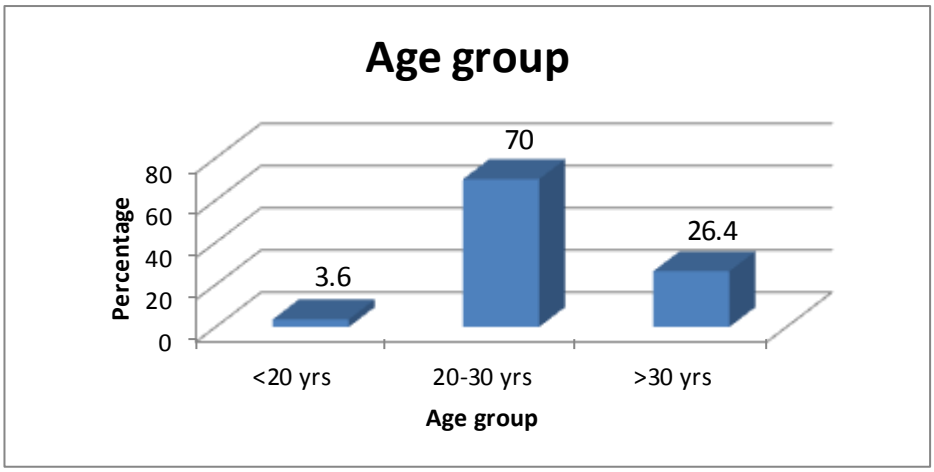
III. Results

1. Incidence:-

Total number of deliveries during the study period was 7466 and the number of PROM cases was 472. So the incidence of PROM comes to 6.3%.

2. Age distribution:-

Majority of the respondents belong to the age group of 20-30yrs. The mean age distribution is 26.99±5.15



3. Distribution of respondents by education:-

All the respondents were literate as shown in Table

Education	Frequency	Percentage
Illiterate	0	0.0
Class 10th passed	25	22.7
Class 12th passed	43	39.1
Graduate and above	42	38.2
Total	110	100.0

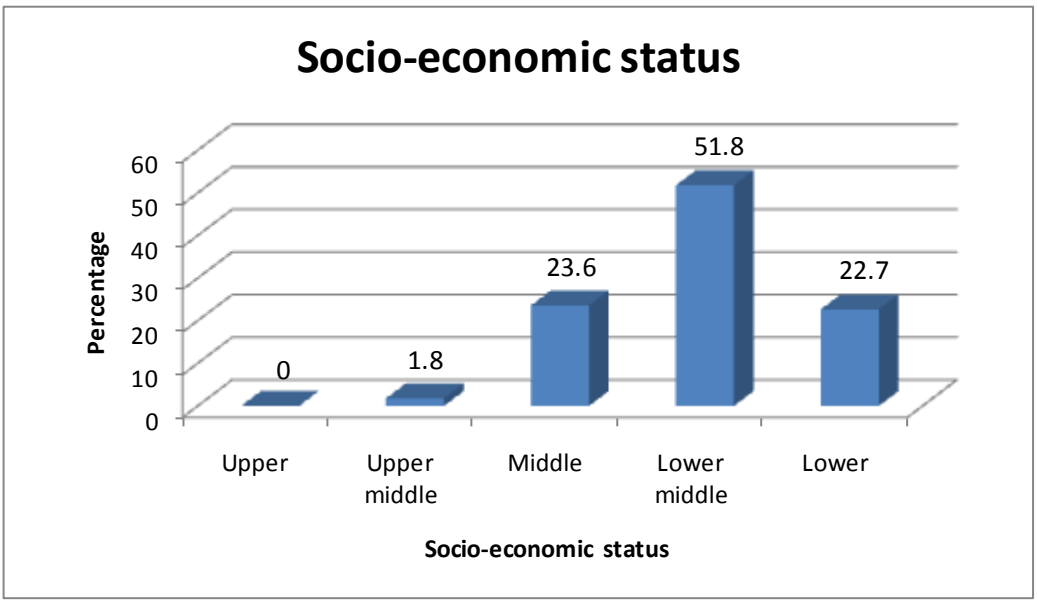
4. Distribution of respondents by duration of drainage (in hrs.) at the time of admission:-

More than half of the respondents (50.9%) reported to JNIMS hospital after 3 hours of drainage

Drain_hrs	Frequency	Percentage
1	2	1.8
2	26	23.6
3	56	50.9
4	22	20.0
5	1	0.9
6	3	2.7
Total	110	100.0

5. Distribution of respondents by socio-economic status:-

Majority of the respondents belong to lower middle socio-economic status.



6. Distribution of respondents by parity:-

Majority of the respondents were primigravidae in 55.5% of the cases.

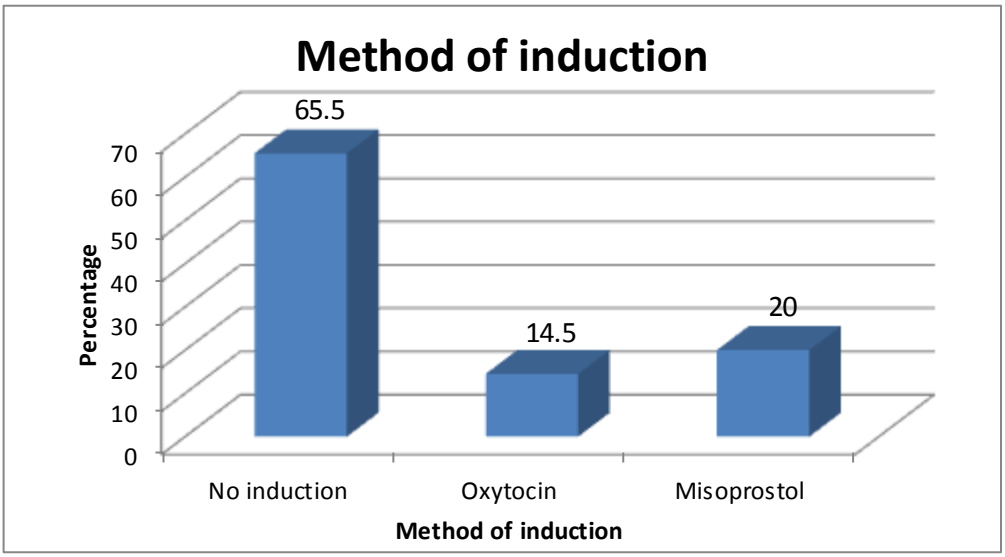
Parity	Frequency	Percentage
0	61	55.5
1	35	31.8
2	11	10.0
4	3	2.7
Total	110	100.0

7. Distribution of respondents by gestational age:-

90.9% of the respondents were term PROM

Gestational age	Frequency	Percentage
<37 weeks	10	9.1
≥37 weeks	100	90.9
Total	110	100.0

8. Distribution of respondents by method of induction



9. Distribution of respondents by PROM to delivery interval (in hrs)

90.9% of the respondents delivered within 24 hours.

PROM to delivery interval_group	Frequency	Percentage
<24 hrs	**100**	**90.9**
24 hrs or more	**10**	**9.1**
Total	**110**	**100.0**

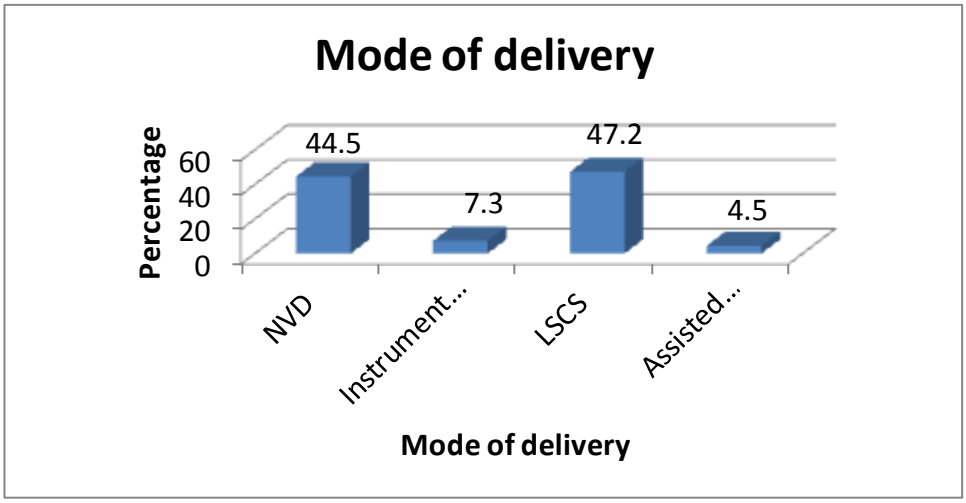
10. Distribution of respondents by risk factors

UTI was the most common identifiable risk factor (18.2%) among the respondents but risk factor was unknown in 60.9% of the cases.

Risk factors	Frequency	Percentage
Unknown	**67**	**60.9**
UTI	**20**	**18.2**
H/O PROM	**17**	**15.5**
Lower genital tract infection	**4**	**3.6**
Polyhydramnios	**2**	**1.8**
Total	**110**	**100.0**

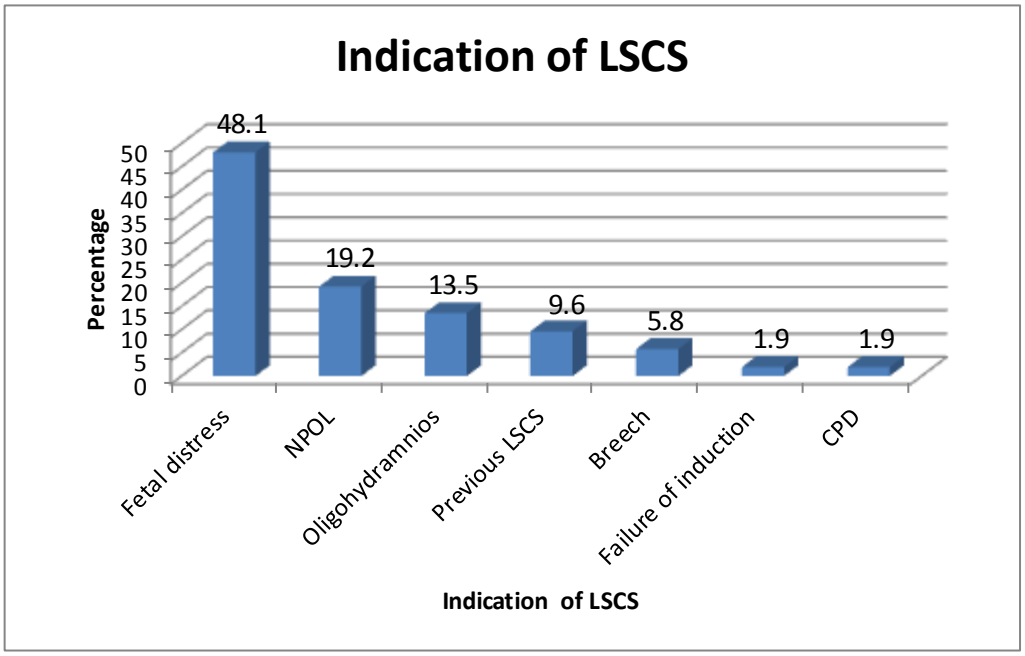
11. Distribution of respondents by mode of delivery:-

More than half of the respondents delivered vaginally in 52.7% cases (NVD + Instrumental + Assisted breech delivery) and by LSCS in 47.2% cases.



12. Distribution of respondents by LSCS indications:-

Majority of the respondents underwent LSCS (48.1%) due to foetal distress.



13. Distribution of respondents by fetal outcome

Fetal outcome was good in 92.7% of the cases.

Fetal outcome	Frequency	Percentage
Good	102	92.7
Prematurity	2	1.8
NICU admission	4	3.6
Neonatal mortality	1	0.9
IUD	1	0.9
Total	110	100.0

14. Relation between Bishop score and mode of delivery

Bishop score	Mode of delivery		P-value
	LSCS	Vaginal	
0 to 5	48(94.1%)	3(5.9%)	0.0001
6 to 10	4(6.8%)	55(93.2%)	

Majority of the respondents (94.1%) underwent LSCS when the Bishop score was low (0 to 5) and 93.2% of the respondents delivered vaginally when Bishop score was good (6 to 10). It was found to be statistically significant (P=0.0001

IV. Discussion

A prospective study to assess the fetomaternal outcome of prelabour rupture of membranes (PROM) was carried out in the Department of Obstetrics and Gynecology, Jawaharlal Nehru Institute of Medical Sciences, Imphal from 1st July, 2018 to 31st October, 2019 among 110 pregnant women with PROM.

Total number of deliveries during the study period was 7466 . During this period, total women with PROM was 472. So the incidence of PROM comes to 6.3%.

1) INCIDENCE

According to previous literatures, incidence of PROM was 4.01% by Kodkany BS et al[21], 6.91% by Nili F et al[31], 5.2% in the study by Gandhi M et al[39], 2.7% - 17% by Gunn GC et al[14],3.3% by Akhtar MS et al[19], 7.71% by Pandey S et al[24].

The incidence of PROM in our study was 6.3% which was comparable to all the above studies.

2) AGE

The range of the age at rupture of membranes was of 24-36 years in those <37 weeks and 37-40 years for those with ≥37 weeks by Kappy KA et al[17].

Akhtar MS et al[19] found that the phenomenon occurred more commonly in women between the 2nd and 3rd decade of life.

The mean age of the patients with PROM was 23.3 years by Koh KS et al[16].
Kodkany BS et al[21] had a maximum number of patients with PROM which were in the age group of 21 to 25 years.
Gandhi M et al[39] had maximum incidence of 77.6% in age group 21-30 years with 59.4% in 21-25 years.
Gahwagi MMM et al[42] had 61% in 21-30 years.
Kiranmaie S[40] had 43% incidence in 21-25 years age group.
In our study, maximum PROM cases were in the age group of 20-30 yrs comprising of 70% which is comparable to above studies.

3) SOCIO-ECONOMIC STATUS

By Raut MD et al[20], 76% of the group with premature rupture of membranes belonged to the low socioeconomic status, 61% according to Pandey S et al[24] belong to the low socioeconomic group. Gandhi M et al[39] study of PROM showed incidence of PROM much higher in rural areas, 61.7% patients came from rural area and 38.3% came from urban area. In the study by Gahwagi MMM et al[42], more than half of the respondents were from low socioeconomic status (54%) and the remaining from middle socioeconomic status.
In our study, 51.8% of PROM cases belonged to lower middle socio-economic status.

4) PARITY

According to Kodkany BS et al[21] 42% were primigravidae, 62% were nulliparous in Pandey S et al[24] study and 55.5% were primigravidae in our present study.

5) GESTATIONAL AGE

In a study by Raut MD et al[20], 66% of the patients with PROM were after completion of 36 weeks.
67% cases of PROM in gestation age of 38-40 weeks by Jayaram VK et al[27].
In our study, 90.9% PROM cases were of gestational age ≥37 weeks.

6) MODE OF DELIVERY

Mode of delivery in the study by Gahwagi MMM et al[42] were full term normal vaginal delivery 62%, post term vaginal delivery 10%, LSCS 28%.
In the study by Shrestha SR et al[35] normal vaginal delivery 70%, instrumental 3.5%, caesarean section 27%.
In Gandhi M et al[39] study, normal vaginal delivery was the commonest mode of delivery (338 cases, 88%), while instrumental delivery rate was only 0.5% (2 cases) and caesarean section rate was 11.5% (44 cases).
In the study by Kiranmaie S[40] 63% women delivered vaginally, 37% delivered by LSCS.
In the study by Shah M et al[38] 81% had FTNVD, 3.8% had forceps delivery, 15.2% had LSCS.
The caesarean rate in patients with PROM were 43% by Koh KS et al[16], 18% in those >37 weeks by Kodkany BS et al[21].
In our study, maximum cases (52.7%) delivered vaginally (44.5% NVD, 7.3% instrumental delivery and 0.9% assisted breech delivery) comparable to the study by Gahwagi MMM et al[42], Shrestha SR et al[35], Gandhi M et al[39], Kiranmaie S[40] and Shah M et al[38].
Also 47.2% delivered by LSCS which is comparable only to Kiranmaie S[40] study. This is because majority of the cases developed foetal distress (21.8%) due to which emergency LSCS was taken up to terminate the cases.

7) INDICATIONS OF LSCS

In the study by Gahwagi MMM et al[42], indications of LSCS were failed induction 50%, foetal distress 28.6%, big baby 3.6%, previous caesarean section 7.2%, drained liquor 3.6%, breech 7.2%.
The common indications of LSCS in Gandhi M et al[39] study were foetal distress in 1st stage of labour (50%) and failure to progress in 1st stage of labour (31.8%).
In our study, LSCS was done for foetal distress (48.1%), previous caesarean section (9.6%) cases which is comparable to Gahwagi MMM et al[42]. Also, foetal distress (48.1%) and non-progress of labour (19.2%) were the most common indications of LSCS which is comparable to the study by Gandhi M et al[39].

8) RISK FACTORS

According to Kodkany BS et al[21], vaginitis (11%), twins (3%), incompetent os (2%) and unknown (17%) were the risk factors.
Pandey S et al[24] found that history of recent coitus (14%), malpresentations (11%), history of previous PROM (8%), incompetent os (3%), polyhydramnios (2%), twins (1%) and 61% were unknown as the various risk factors seen in PROM.
Genital tract infection (40%), recent coitus (1%), malpresentations (14%) and incompetent cervix (2%) were the major risk factors according to Jayaram VK[27].
In this study, the risk factors were H/O PROM (15.5%), polyhydramnios (1.8%) and unknown (60.9%) which is comparable to Pandey S et al[24] study. The other risk factors were UTI (18.2%) and lower genital tract infection (3.6%).

9) APGAR SCORES

Apgar scores were taken at 1 min and at 5 min interval after delivery. It was observed that the scores were greatly influenced by the latent period, gestational age at delivery, prematurity and maternal condition prior to delivery.

Evaldson et al[18] found 15% of the babies with apgar score <7 at 5 min. Jayaram VK et al[27] found 7.5% having scores <7 at 5 min.

In our study, 2.7% babies had apgar score <7 at 5 min with latent period of >24 hours.

10) FETO-MATERNAL OUTCOME

There was no maternal morbidity (chorioamnionitis, endometritis and sepsis) and mortality in our study. This can be attributed to timely interventions of pregnant women with PROM mainly in the administration of injectable antibiotics once PROM diagnosis was confirmed on admission and use of proper method of induction. However, there were few neonatal complications.

Akhtar MS et al[19] found that perinatal mortality was 8.1% if the latent period was <24 hours and 91.8% if >24 hours.

Kodkany BS et al[21] found that among the neonatal morbidity, birth asphyxia was 29.5%, RDS 27.7% and septicaemia 12%.

Jayaram VK et al[27] reported that the neonatal morbidity in term infants with PROM was 17.9% and that of preterm PROM was 24%.

Gupta S et al[52] study reported birth asphyxia comprises of 8%, neonatal sepsis 4%, NICU admission 26% and neonatal mortality 2%.

In our study, there were 4 cases of NICU admission (3.6%), 2 cases of prematurity (1.8%), 2 cases of perinatal mortality (1.8%) with no cases of jaundice and sepsis. Lesser complications as compared to the above studies may be due to smaller sample size of the present study and also due to majority of cases being term PROM (90.9%).

V. Conclusion

Prelabour rupture of membranes (PROM) though common in term pregnancies, is not responsible for the increased maternal and neonatal morbidity in these women. The grave outcome with regards to the mother and the fetus in particular is seen commonly when the rupture of membranes occur before term.

The incidence reported in the study is 6.3%. The major identifiable risk factors include UTI, H/O PROM, lower genital tract infection and polyhydramnios. However, a vast majority of the risk factors were unknown in most cases. Nutritional deficiencies leading to deficit production of collagen ultimately leading to PROM has also been associated.

The latent period being inversely proportional to period of gestation is an established rule and it poses a challenge with complications of abruption, oligohydramnios, prolapsed umbilical cord and distress. If it progress to preterm delivery (30% of them usually do) it is subjected to high rates of neonatal morbidity and mortality.

Management of PROM for a successful outcome is still controversial. Aggressive management showed higher rates of caesarean section whereas conservative management increases risk of maternal infection. Recently, the administration of prostaglandin gel or tablets has been widely practiced for induction of labour with satisfactory results.

The present study favors conservative management for at least 12-24 hours with an outcome of no maternal morbidity and mortality, lesser neonatal complications due to administration of prophylactic antibiotics, antenatal corticosteroids. The perinatal mortality was more associated with prematurity.

Thus it is suggested to correct identifiable risk factors viz. UTI, lower genital tract infection with vigorous antibiotic treatment. Patients with history of PROM should be warned about the risk in the present pregnancy.

With the aim of improving the feto-maternal outcome, labour should be induced in all term PROM with at least 6-12 hours admission to induction interval giving time for those that can go into spontaneous onset of uterine contractions, thus reducing caesarean rates without compromising the risk of maternal and neonatal infection.

Finally, presence of neonatal care providers at the time of delivery and provision for maternal-fetal intensive care units for a better outcome for both the mother and neonate is highly suggested.

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