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Neonatal Outcome in Babies Born to Mothers with PROM

Jyoti B. Sarvi[1], Raghavendra Kulkarni[2]

[1]Senior Resident, Department of Pediatrics, Gulbarga Institute of Medical Science, Kalaburagi, Karnataka 585101, India. [2]Pediatrician, Government General Hospital, Jewargi, Kalaburagi, Karnataka Karnataka 585310, India.

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Abstract

Objectives: To know the incidence of neonatal complications following premature rupture of membranes more than 12 hours.To study the incidence of early onset sepsis following premature rupture of membranes more than 12 hours. To know the incidence of mortality among neonates born to mothers with PROM more than 12 hours. To know the incidence of neonatal infection in neonates born to mothers with history of PROM more than 12 hours who have not received antibiotics before labour.

Methods: Total 185 neonates born to mother's with PROM of more than 12 hours were evaluated in this study born in Sangameshwar Teaching Hospital and Basaveshwar General and Teaching Hospital attached to M.R. Medical College, Gulbarga. Clinical features like fever, feeding difficulties and respiratory distress were commonly encountered. Laboratory investigations like total count, band count, toxic granules and baby's blood culture were used for the diagnosis of sepsis.

Results: The present prospective study includes 185 cases of neonates born to mothers with PROM of more than 12 hours duration. The incidence of PROM was 4.12%, Respiratory distress syndrome was the most commonest clinical manifestation 35 (18.91%) followed by septicemia 28 cases (15.14%) and pneumonia 3 cases (1.62%). The incidence of septicemia was 15.14%. Most common organisms isolated in blood culture of neonates were Klebsiella in 13 cases (40.6%), Staphylococcus 10 cases (31.3%), E.coli 6 cases (18.8%) and Pseudomonas 3 cases (9.4%). There was strong correlation between maternal genital flora and bacterial isolates of baby's blood culture. The incidence of neonatal deaths was 1.08% of 15.14% of early onset septicemic neonates.

Conclusion: PROM is a high risk Obstetric condition, active management is needed to enable delivery within 18 hours of PROM and it offers better neonatal outcome

Keywords: Premature rupture of membranes; Early onset septicemia; Pneumonia; Respiratory distress syndrome.

Introduction

Pre mature rupture of membranes (PROM) is defined as rupture of membranes before onset of labour. When this occur before 36 wks of gestation it is called preterm PROM [1].

Premature rupture of fetal membranes occurs in approximately 10% of all pregnancies and preterm PROM as been estimated at 3%-4.5% of all deliveries [2].

The etiology of PROM seems to be multifactorial, several predisposing factors like black race, low

Corresponding Author: Jyoti B Sarvi, Senior Resident, Department of Pediatrics, Gulbarga Institute of Medical Science, Kalaburagi, Karnataka 585101, India.

E-mail: sarvi11289@gmail.com

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socioeconomic group, smoking, history of PROM in previous pregnancies, vaginal bleeding, multifetal pregnancy and polyhydromnios may play role in PROM [3].

The fetal and neonatal morbidity and mortality risks are significantly affected by severity of oligohydromnios, duration of latency, gestation at PROM.

The most significant maternal risk is intrauterine infection which increases with the duration of rupture of membranes.

The complication of PROM for the infants are preterm delivery, infection (pneumonia, sepsis), pulmonary hypoplasia, limb and body deformity, umblical cord compression, abruption and cord prolapse [2].

Neonatal sepsis is clinical syndrome characterized by signs and symptoms of infection with or without accompanying bacteremia in 1st month of life.

Neonatal sepsis can be classified into two major categories depending upon the onset of symptoms.

Early onset sepsis; it presents within 72 hours of life and infants usually presents with respiratory distress and pneumonia, the source of infection is maternal genital tract and labour room [4]. Early onset sepsis occurs due to ascending infection following rupture of membranes or during passage of baby through infected birth canal [5].

The important part of PROM management is accurate assessment of gestational age, pulmonary maturity and presence or absence of sepsis.

The most common fetal morbidity associated with preterm PROM is respiratory distress syndrome and is related primary to gestational age at delivery. It may be advantageous to prolong pregnancy in order to reduce the risk of gestational age dependent morbidity.

In current scenario PROM is managed aggressively by preventing infection, delaying the delivery until fetal lung maturity and active intervention by induction of labour if longer preventable.

The knowledge of neonatal complication in relation to PROM and its effect on neonates is essential to reduce neonatal morbidity and mortality.

Diagnosis of early onset sepsis, close observation for early signs of sepsis, aggressive evaluation and early treatment has decreased the incidence of early onset sepsis associated with PROM. The present study was undertaken to evaluate newborns born to mothers with PROM for early onset sepsis. Neonatal outcome has also been evaluated in the prospective study.

Fetal and Neonatal Outcome: management of PROM has undergone intensive change in the resulting in significant alterations in the risks for morbidity and mortality in the fetus and neonate. Categories of major significance of fetal and neonatal outcome include:

a. Fetal and neonatal infections.
b. Fetal Growth.
c. Perinatal asphyxia.
d. Neonatal RDS.
e. Congenital anomalies.
f. Perinatal mortality.

Materials and Methods

This is a prospective study conducted from December 2013 to May 2015 in Sangameshwar Hospital and Basaveshwar Teaching and General Hospital, attached to M.R. Medical College, Gulbarga.

Selection of Cases

All neonates born to healthy mothers with PROM more than 12 hours during their hospital stay were studied in this study.

A detailed history was taken including age, parity, Obstetric history of the mother with emphasis on exact time of rupture of membranes, duration history and antibiotics before labour were evaluated. Detailed birth history including resuscitation details, Apgar score and gestational age assessment were evaluated.

In examination of the neonate the pulse rate, respiratory rate, CFT and temperature were noted followed by systemic examination. Required investigations are done for the neonate and followed during their hospital stay.

Inclusion criteria

All neonates born to healthy mothers with PROM more than 12 hours.

Exclusion criteria

1. Antepartum hemorrhage
2. Toxemia of pregnancy

3. Medical disease in mother other than infection.
4. Meconium aspiration syndrome.
5. Major congenital malformations.
6. Neonates with hyaline membrane disease.

Following investigations were carried out:

- Hb% was estimated by automated analyzer.
- Total leukocyte count (TLC) estimated by automated analyser.
- Differential leucoyte count (DLC) done by peripheral smear.
- Band count estimated by peripheral smear.
- Toxic granules estimated by peripheral smear.
- CRP semi quantitive estimation by latex agglutination technique.
- Blood culture and sensitivity.
- Urine analysis, urine culture and sensitivity (if required).
- Chest x-ray (if required).
- CSF analysis and head ultrasound (if required).

Cervical swab from selected mothers with PROM of more than 12 hours who have not received antibiotics before labour for culture.

The present study is undertaken to know the incidence of PROM, to know incidence of early onset septicemia and mortality among neonates born to mothers with PROM more than 12 hours and also to know the incidence of neonatal infection in neonates born to mothers with history of PROM more than 12 hours who have not received antibiotics before labour.

Results

In this study, there were 4452 pregnant women who delivered out of which 185 were complicated with premature rupture of membranes (4.155%).

Table 1: Incidence of premature of rupture of membranes

	Total number of delivery	Number of PROM	Percentage
Present study	4452	185	4.12

The total number of neonates included in this study 185. (Table 1).

Table 2: Distribution of cases according mode of delivery

Mode of delivery	Number of Cases	Percentage
Normal vaginal delivery	62	33.51%
Caesarean section	123	66.49%
Total	185	100%

This table 2 shows that 62 (33.51%) neonates are delivered by normal vaginal delivery and 123 (66.49%) were delivered by caesarean section (Fig. 1).

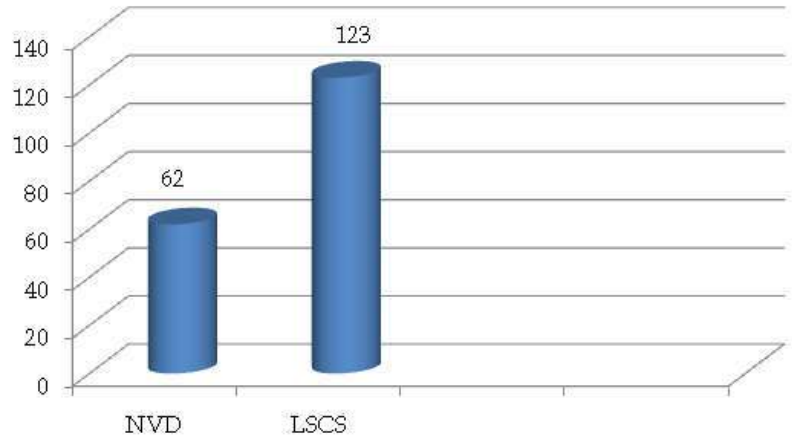

Fig. 1: Distribution of cases according mode of delivery

Table 3: Distribution according to gestational age

Gestational age	Number of Cases	Percentage
<37 weeks	55	29.73%
>37 weeks	130	70.27%
Total	185	100%

This table 3 shows that out 185 cases 55 (29.73%) were of < 37 weeks and 130 cases (70.27%) were gestational age more than 37 weeks (Fig. 2).

Table 4: Distribution of cases of according to birth weight

Weight in grams	Number of Cases	Percentage
<1500	3	1.62%
1500-2500	62	33.51%
>2500	120	64.87%
Total	185	100%

The analysis shows that out of 185 neonates 3 (1.62%) cases weighing <1500 gms, 62 (33.51%) cases were weighing between 1500 and 2500 gms and 120 cases (64.87%) weighing >2500 gms. (Table 4 and Fig. 3)

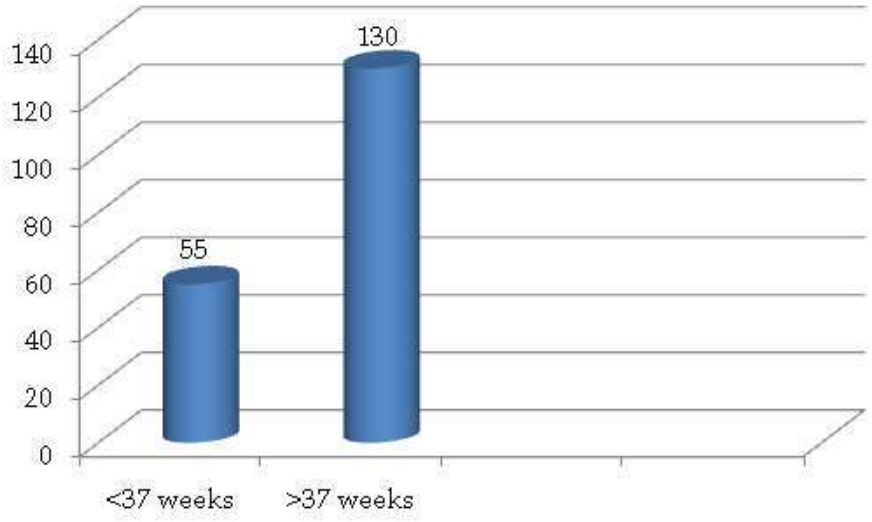

Fig. 2: Distribution according to gestational age

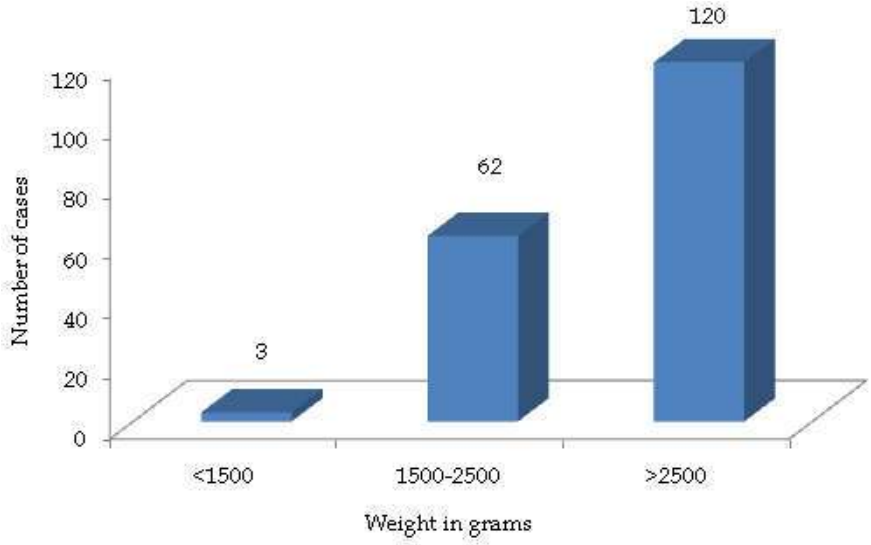

Fig. 3: Distribution of cases of according to birth weight

Table 5: Sex wise distribution of neonates

Sex	No of Cases	Percentage
Male	82	44.32%
Female	103	55.68%
Total	185	100%

The analysis of the present study shows that out of 185 neonates 82 (44.32%) were males and 103 (55.68%) were females (Table 5 and Fig. 4).

Table 6: Distribution of cases according to duration of PROM

Duration in hours	Number of Cases	Percentage
12-18 hrs	91	49.19%
18-24 hrs	40	21.62%
24-48 hrs	36	19.46%
>48 hrs	18	9.73%
Total	185	100%

The analysis shows that out of 185 mothers 91 (49.19%) had PROM of 12-18 hrs duration, 40 (21.62%) had 18-24 hrs, 36 (19.46%) had PROM 24-48 hrs and 18 (9.73%) had >48 hrs of duration (Table 6 and Fig. 5).

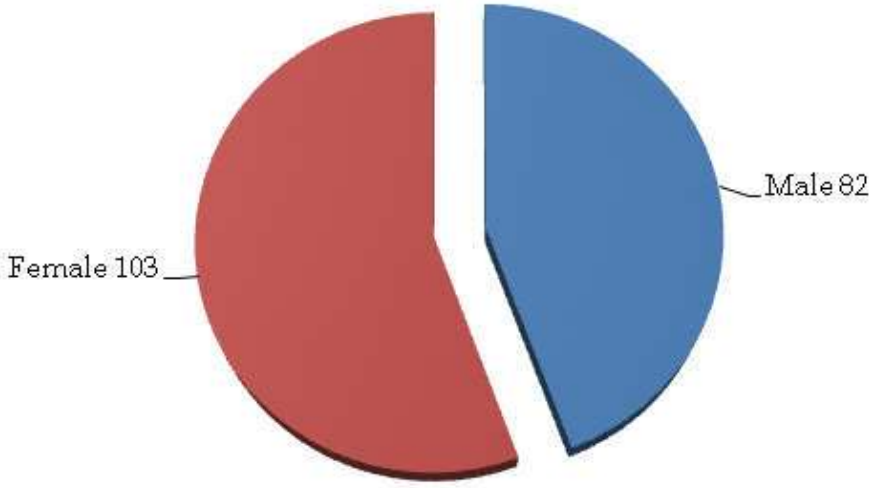

Fig. 4: Sex wise distribution of neonates

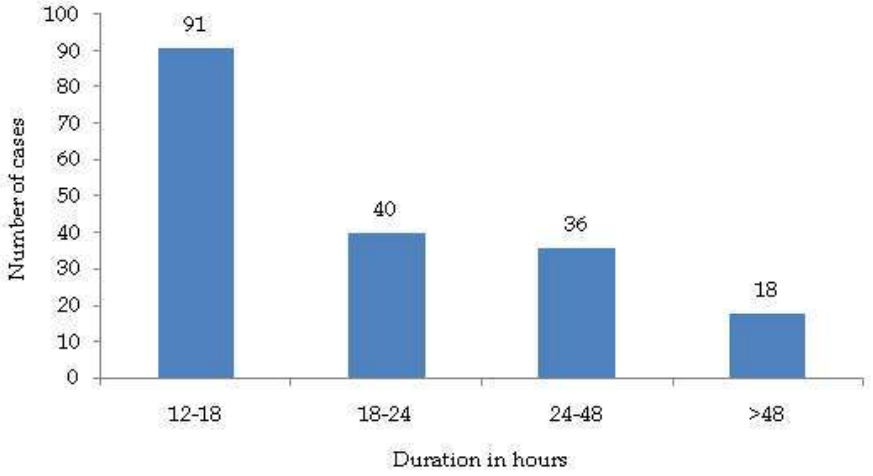

Fig. 5: Distribution of cases according to duration of PROM

Table 7: Distribution of cases according to cervical swab culture

Organisms	Number of Cases	Percentage
Klebsiella	22	11.89%
Staphylococcus	15	8.10%
E.Coli	13	7.02%
Pseudomonas	3	1.62%
No growth	132	71.35%
Total	185	100%

Cervical swab culture and sensitivity was done in all the cases with PROM. Out 185 cases 53 (28.63%) had growth on the cervical swab culture. Out of 185 cases Klebsiella was grown in 22 (11.89%) cases, Staphylococcus growth was seen in 15 (8.10%) cases, E.coli was grown in 13 (7.02%) cases and Pseudomonas was isolated in 3 cases (1.62%) (Table 7 and Fig. 6).

Table 8: Distribution of cases according to neonatal morbidity

Type of morbidity	Total cases	Percentage
R.D.S	35	18.92%
Septicemia (EOS)	28	15.14%
Pneumonia	3	1.62%
Meningitis	0	0
NEC	0	0
Asymptomatic	119	64.32%
Total	185	100%

Morbidity was seen in 66 (35.68%) out of 185 cases. This table shows that out 185 cases 35 cases (18.98%) had respiratory distress syndrome, it is the commonest morbidity in present study. The next commonest being. Septicemia (EOS) seen in 28 cases (15.14%) (Table 8 and Fig. 7).

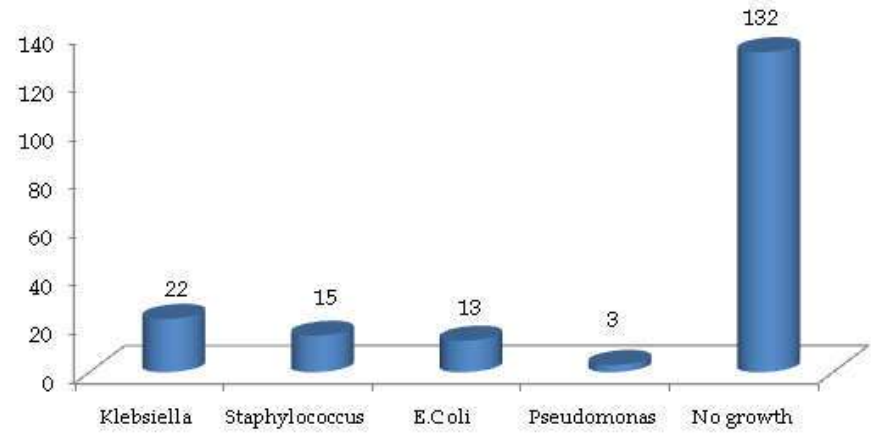

Fig. 6: Distribution of cases according to cervical swab culture

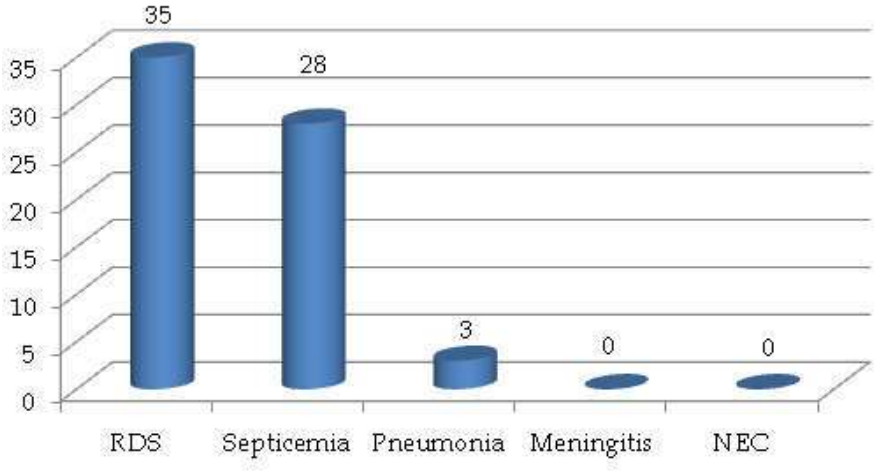

Fig. 7: Distribution of cases according to neonatal morbidity

Table 9: Distribution of cases according gestational age and neonatal morbidities

Morbidity	Gestation age in weeks			Total Cases
	< 34	34-37	> 37	
RDS	11 (5.95%)	17 (9.19%)	7 (3.78%)	35 (18.91%)
Septicemia	4 (2.16%)	10 (5.41%)	14 (7.57%)	28 (15.14%)
Pneumonia	0	1 (0.54%)	2 (1.08%)	3 (1.62%)
Meningitis	0	0	0	0
NEC	0	0	0	0
Total	15 (7.66%)	28 (15.14%)	23 (12.43%)	66 (35.68%)

Out of 185 cases 66 cases (35.68%) had morbidity. In that 66 cases (35.68%) 43 cases were born before 37 weeks. So neonatal morbidity was common in preterm babies. Out of 35 cases of RDS (18.91%), 28 cases (15.14%) were of preterm gestation. Septicemia was more common in preterm babies. X2 = 27.5, P < 0.001. There was highly significant difference in morbidity among preterm (<37 weeks) and term(>37weeks). Out of 55 cases with gestational age less than 37 weeks 43 cases (78.18%) had morbidity (Table 9 and Fig. 8).

Table 10: Neonatal morbidity in relation to duration of PROM

Complication	PROM 12-18 hrs	PROM 18-24 hrs	24-48 hours	>48 hours
RDS	00(00.00%)	20(10.81%)	05(2.70%)	10(5.41%)
Septicemia	00(00.00%)	6(3.24%)	15(8.11%)	7(3.78%)
Pneumonia	00(00.00%)	0(0.00%)	02(1.08%)	1(0.54%)
Total	00(00.00%)	26(14.05%)	22(11.89%)	18(9.73%)

This table 10 shows that as PROM increases incidence of EOS. Thus if duration of PROM is more than 24 hours, the incidence of septicemia was 11.9% as compared to 3.24% incidence when duration was less than 24 hours. But when duration of PROM was less than 24 hours R.D.S was common. X2 = 27.5, P < 0.001 highly significant. Morbidity is more in the neonates with longer duration of PROM. It is statistically significant (Fig. 9).

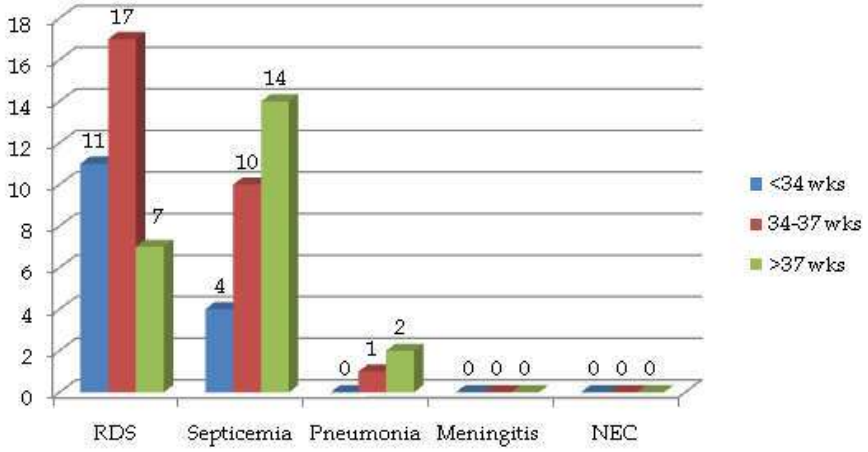

Fig. 8: Distribution of cases according gestational age and neonatal morbidities

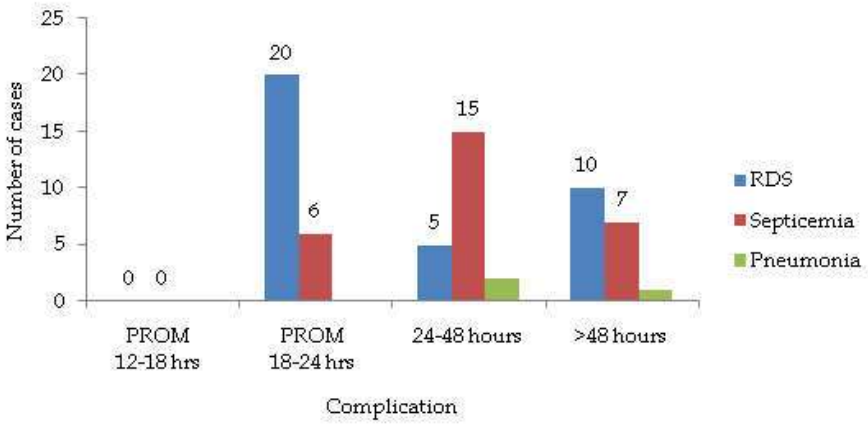

Fig. 9: Neonatal morbidity in relation to duration of PROM

Table 11: Distribution of neonatal deaths according to duration of PROM

Duration in hours	Live Cases		Deaths		Total	
	No	%	No	%	No	%
12-18	91	49.19	00	00	91	49.19
18-24	40	21.62	00	00	40	21.62
24-48	35	18.91	1	0.54	36	19.46
>48	17	9.19	1	0.54	18	9.73
Total	183	98.91	2	1.08	185	100

Analysis shows that out of 185 neonates with history of PROM two case (1.08%) died, out of which 1 case died duration of 24-48 hours and another case died duration of > 48 hours (Table 11 and Fig. 10).

Table 12: Distribution of cases in relation to leucocyte counts

Variable	Number of cases	Percentage
WBC (cells/cumm)		
<5000	17	9.19%
5000-20000	147	79.46%
> 20,000	21	11.35%
Total	185	100%

Normal WBC count was taken as a range between, 5000-20,000/cum (Steigbiggel et al.) [47]. The analysis shows that out of 185 cases 17 (9.18%) had leucopenia and Leucocytosis was observed in 21 cases (11.35%) (Table 12 and Fig. 11).

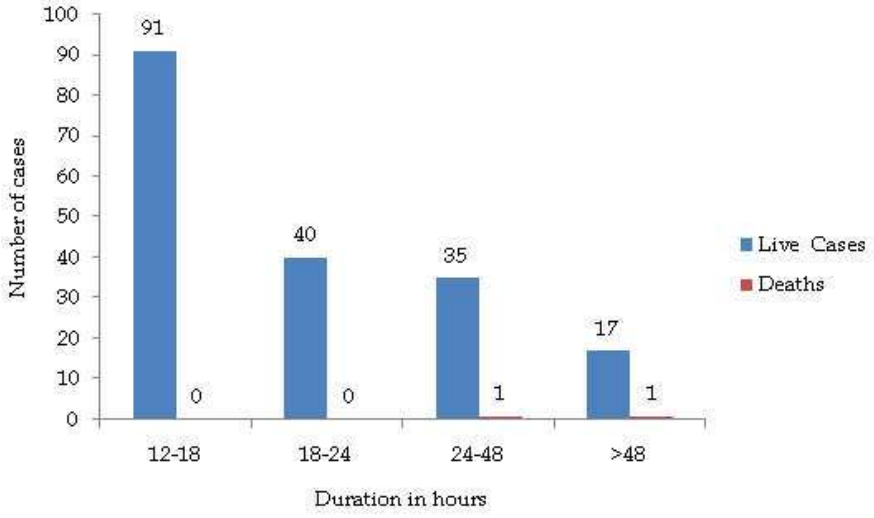

Fig. 10: Distribution of neonatal deaths according to duration of PROM

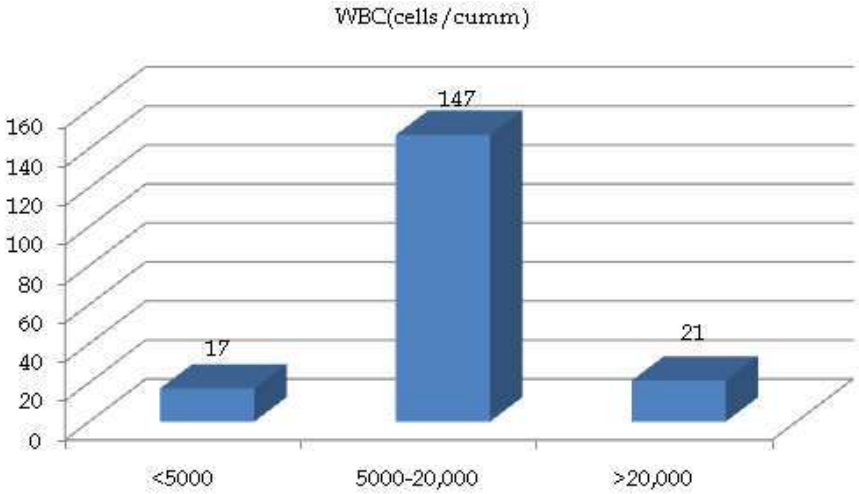

Fig. 11: Distribution of cases in relation to leucocyte counts

Table 13: Distribution of cases according to their CRP results

Variable	Number of cases	Percentage
CRP		
Positive	57	30.81%
Negative	128	69.19%
Total	185	100%

In the present study out of 185 cases C-reactive protein was positive in 57 cases (30.81%) and negative in 128 cases (69.19%) (Table 13 and Fig. 12).

Table 14: Distribution of CRP Results according to duration of PROM

Duration of PROM	CRP Positive	CRP Negative
12-18 hrs	3 (1.62%)	88 (47.57%)
18-24 hrs	11 (5.95%)	29 (15.68%)
24-48 hrs	26 (14.05%)	10 (5.41%)
>48 hrs	17 (9.19%)	1 (0.54%)
Total	57 (30.81%)	128 (69.19%)

In the present study out of 185 cases C-Reactive Protein was positive in 57 cases (30.81%), out of which CRP was positive in 3 (1.62%) cases in 12-18 hrs, 11 (5.95%) cases in 18-24 hrs, 26 (14.05%) cases in 24-48 hrs and 17 (9.19%) cases in >48 hrs (Table 14 and Fig. 13).

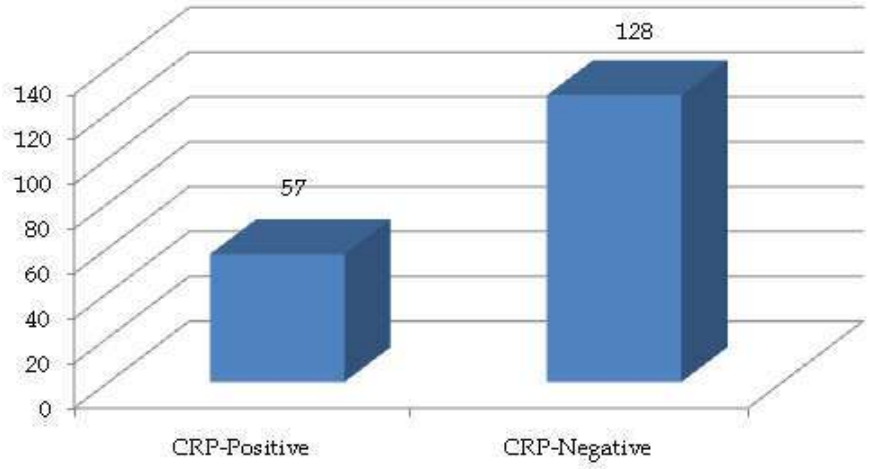

Fig. 12: Distribution of cases according to their CRP results

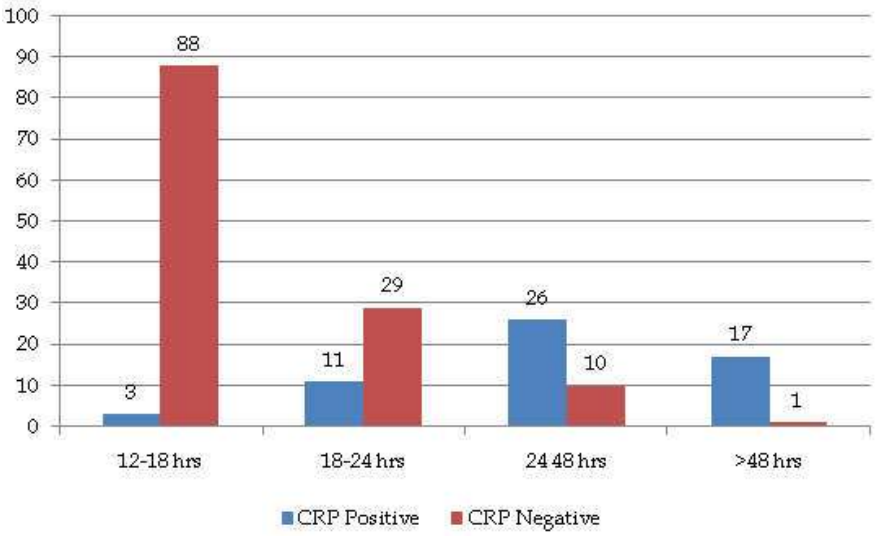

Fig. 13: Distribution of CRP results according to duration of PROM

Table 15: Distribution of cases according to their blood culture

Blood culture	Number of cases	Percentage
Positive	32	17.30%
Negative	153	82.70%
Total	185	100%

The analysis shows that out of neonates born to healthy mothers with PROM of more than 12 hours 32 cases (17.30%) had growth in blood culture (Table 15 and Fig. 14).

Table 16: Organisms isolated in blood culture

Organism	Live		Death		Total	
	No	%	No	%	No	%
Klebsiella	12	37.5	1	3.1	13	40.6
Staphylococcus	9	28.1	1	3.1	10	31.2
E.coli	6	18.8			6	18.8
Pseudomonas	3	9.4			3	9.4
Total	30	93.8	2	6.2	32	100

The analysis shows that was Klebsiella most common organism causing sepsis 13 cases (40.6%) out 32 cases. Out of 32 cases 2 (6.2%) case died due to Klebsiella and Staphylococcal septicemia (Table 16 and Fig. 15).

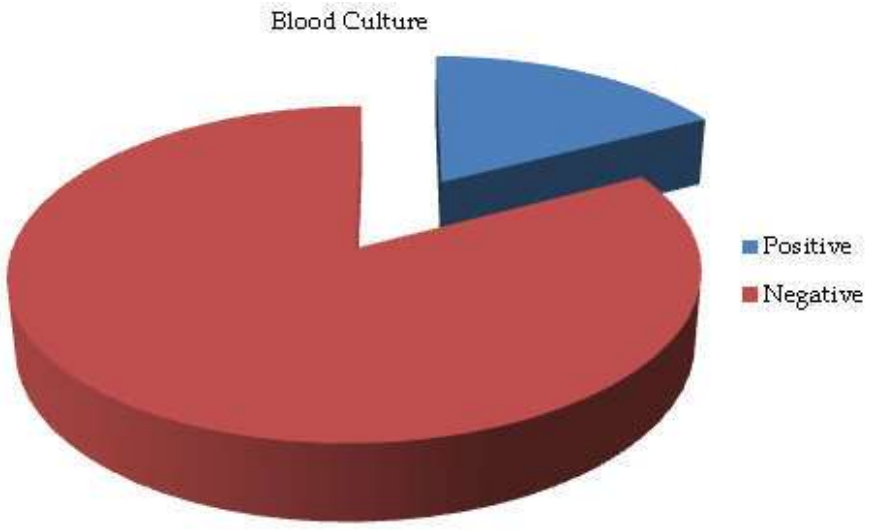

Fig. 14: Distribution of cases according to their blood culture

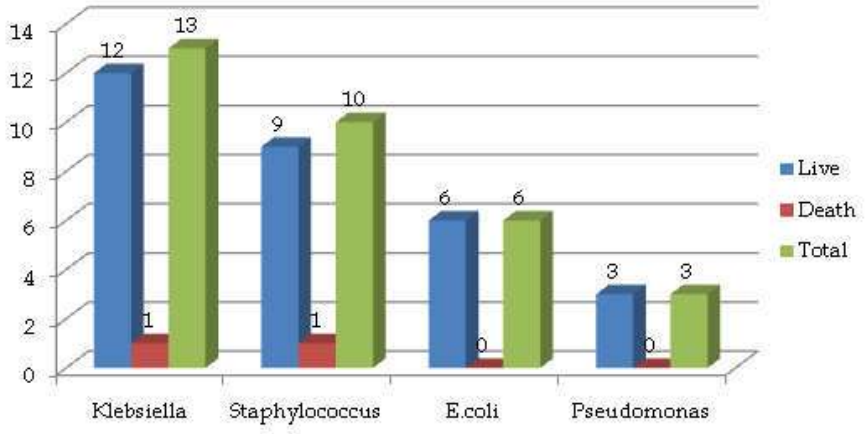

Fig. 15: Organisms isolated in blood culture

Table 17: Organisms isolated according to duration of PROM

Organisms	PROM 12-18 hrs	18-24 hrs	24-48 hrs	>48 hrs	Total
Klebsiella	0	2 (6.25%)	6 (18.75%)	5 (15.63%)	13 (40.63%)
Staphylococcus	0	2 (6.25%)	6 (18.75%)	2 (6.25%)	10 (31.25%)
E.coli	0	1 (3.13%)	3 (9.38%)	2 (6.25%)	6 (18.75%)
Pseudomonas	0	0	3 (9.38%)	0	3 (9.38%)
Total	0	5 (15.63%)	18 (56.25%)	9 (28.13%)	32 (100%)

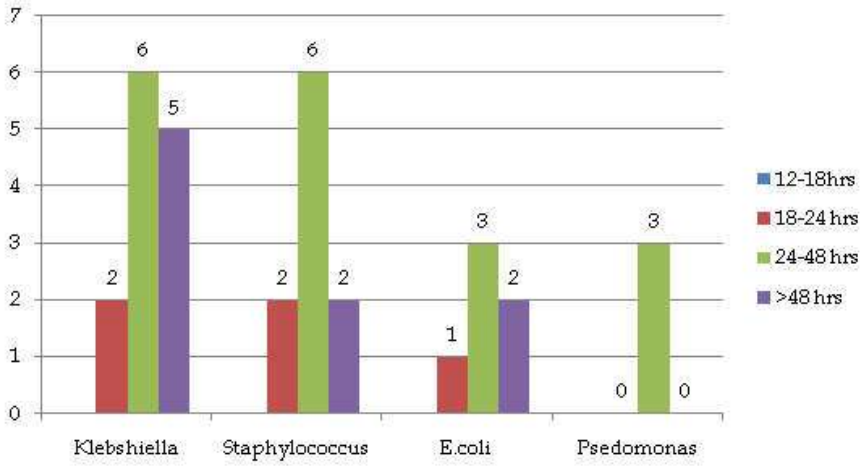

Fig. 16: Organisms isolated according to duration of PROM

The analysis shows that Klebshiella was most common organism causing sepsis and 6 cases were isolated from 24-48 hrs of duration of PROM, Staphylococcus was isolated next common organism causing sepsis and 6 cases were isolated from 24-48 hrs of duration of PROM (Table 17 and Fig. 16).

Discussion

This was a prospective study conducted from December 2013 to May 2015. The analysis of present study shows that 4452 pregnant women have delivered, out of which 185 (4.12%) were complicated with PROM.

Table 18: Incidence of Premature rupture of membranes.

	F.Nili and AA. Shams Ansari	Adentunji o Adenji and Oluse o Atanda	Present Study
Total number of delivery	2357	2340	4452
Number of PROM	163	92	185
Percentage	6.91%	3.91%	4.12%

F. Nili and AA. Shams Ansari study found the incidence of PROM was 6.91% [2]. According to Adentunji o Adenji and Oluse o Atanda [8] study found the incidence of PROM was 3.91% [60]. The present study incidence of PROM is 4.12%, which is consistent with Adentunji o Adenji and Oluse o Atanda.

Total of 185 neonates were included in this study, born in Sangameshwar Hospital and Basaveshwar General and Teaching Hospital.

Table 19: Distribution of cases according to mode of delivery

Mode of delivery	Kifah Al-Q Qa & Fatin Al-Awayshah study	Sanyal and Mukherjee study	F.Nili and AA. Shams Ansari study	Present study
Normal vaginal delivery	54%	87%	34.4%	33.51%
Caesarean section	20%	13%	65.6%	66.49%

In Sanyal and Mukherjee study 87%cases are delivered by vaginal route and 13% are delivered by LSCS [11]. F. Nili and AA.Shams Ansari study 34.4% are delivered by vaginal route and 65.6% are delivered by LSCS [2]. In the present study Caesarean section was found to be the commonest

mode of Delivery 64.49%, which is consistent with F. Nili and AA.Shams Ansari study.

Table 20: Comparison of cases according to gestational age

Gestational age in weeks	Woranart et al.	Kifah Al-Q Qa & Fatin Al-Awayshah study	Danforth	Present study
<37	42.3%	62%	30%	29.73%
>37	57.69%	38%	70%	70.27%

Kifah Al-Q Qa & Fatin Al-Awayshah study found that incidence of PROM Was more in preterm gestation [7].

According to Danforth 70% of cases of PROM occurred at term and 30% of PROM occurred at preterm [6].

The present study shows increase in incidence of PROM in term gestation. These results are consistent with Danforth [6].

Table 21: Comparison according to Birth weight

Weight in grams	Woranart et al.	Shubeck F et al.	Present study
<2500	28.84%	24.8%	35.13%
>2500	71.15%	75.2%	64.87%

Shubeck F et al. study incidence of PROM was more in babies weighing less than 2500 gms (24.8%) [9].

In the present study the incidence of PROM was more in babies weighing more than 2500 gms (64.87%) but this is due to fact that the total number of babies weighing >2500 gms were more in the sample. Similar results were observed in Woranart et al study [10].

Table 22: Comparison of Cases according to sex

Total number of cases studied	Woranart et al. (n=5, 182)	Present study (n=185)
Males	53.96%	44.32%
Females	46.04%	55.68%

In the present study out of 185 cases 44.32% were males and 55.68% were female.

Table 23: Comparison according to the duration of PROM

Duration	Muhammad Matloob Alam et al.	Priscilla Frenette et al.	Present Study
<24 hrs	63%	52.2%	70.8%
24-48 hrs	29%	28.4%	19.5%
>48 hrs	8%	19.4%	9.7%

In Muhammad Matloob Alam et al. study 63% cases had PROM of <24 hrs duration, 29% cases had PROM of 24-48 hrs and 8% cases had PROM of >48 hrs [12].

In Priscilla Frenette et al. study 52.2% % cases had PROM of <24 hrs duration, 28.4% cases had PROM of 24-48 hrs and 19.4% cases had PROM of >48 hrs [13].

In the present study 70.8% cases had PROM of <24 hrs duration, 19.5% cases had PROM of 24-48 hrs and 9.3% cases had PROM of >48 hrs, which is consistent with Muhammad Matloob Alam et al. study.

Table 24: Comparison according to cervical swab culture

Organism	Asinidi A Asindi et al.	Kodakay and Telang	Gibbs and Duff	Present study
Klebsiella	13%	11%	0	11.89%
Staphylococcus	24%	6%	0	8.10%
E. Coli	0	20%	8%	7.02%
Pseudomonas	11.3%	0	0	1.62%

Kodakay and Telang study isolated E.coli in 20% cases, Klebsiella 11% cases and Staphylococcus in 6% cases [14].

Gibbs and Duff study found growth of E.coli in 8% of cases [16].

In the present study commonest organisms isolated was Klebsiella (11.89%) followed by Staphylococcus (8.10%) and E.coli (7.02%) and Psuedomonas (1.62%).

Table 25: Comparison according to neonatal morbidity

Morbidity	Nili and AA Shams Ansari	Anjanadevi and Reddy Devi	Anjana Devi	Present study
RDS	33.3	18.3%	-	18.92%
Septicemia	5.5	53.8%	11.5%	15.14%
Pneumonia	2.5	-	5.8%	1.62%
Meningitis	0	-	2.9%	0

Anjana Devi and Reddy Devi et al. found neonatal infection in 53.8% cases and RDS in 18.3% [17].

Anjana Devi et al. found septicemia in 11.5%, pneumonia in 5.8% and meningitis in 2.9% cases [18]. In the present study RDS was seen in 18.92% cases, septicemia in 15.14% cases and pneumonia, in 1.62% cases.

Table 26: Neonatal morbidity in relation to gestation

Morbidity	Gestation in weeks	
	<37 weeks	>37 weeks
RDS	15.14%	3.78%
Septicemia	8.58%	7.57%
Pneumonia	0.54%	1.08%
Meningitis	0%	0%

Merenstein GB and Weisman LE observed that when PROM is accompanied with prematurity the incidence of proven sepsis is 4-6% [19].

In the present study neonatal morbidity was more among preterm neonates with PROM.

Table 27: Neonatal morbidity in relation to duration of PROM

Complication	<24 hrs			>24 hrs		
	Nili and sham study	Taylor study	Present study	Nili and sham study	Taylor study	Present study
Septicemia	18.4%	1.3%	3.24%	15.3%	13.3%	11.89%
Meningitis	0	0		0	0	
Pneumonia	1.2%	0	0.54%	2.5%	0	1.08%

F Nili and AA Shams Ansari observed that the risk of pneumonia and mortality were much higher in group with > 24 hrs of PROM. Taylor claimed that as latent period increased from 12 hours to more than 24 hours neonatal infection rate also increase from 1.3% to 13.3% [20]. The present study shows that complications are more as the duration of PROM increases.

Table 28: Neonatal deaths according to duration of PROM

Duration in hours	Live	Deaths
12-18 hrs	49.19%	0
18-24 hrs	21.62%	0
24-48 hrs	18.91%	0.54%
>48 hrs	9.19%	0.54%

Analysis from the present study shows that mortality in neonates born to mothers with PROM is directly related to the duration of PROM. F. Nili and A.A. Shams Ansari observed that mortality in one group with PROM <24 hrs is less than mortality in one group with PROM > 24 hours [2].

Table 29: Cases according to their leucocyte count

Variable	Kifah Al-Q Qa & Fatin Al-Awayshah study	Present study
<5000	41.7%	9.19%
5000-20000	58.3%	79.46%
>20,000	0	11.35%

Kifah Al-Q Qa & Fatin Al-Awayshah observed leucopenia in 41.7% cases and 58.3% cases had leucocyte count between 5000 – 20000 cells/cumm [7]. The present study analysis shows that 9.19% of the neonates had leucopenia Leucocytosis was observed in 11.35% cases.

Table 30: Cases according to CRP results

Variable	Kifa AlQa & Fatin Al-Awayshah study	Present study
CRP Positive	21.7	30.81%
CRP Negative	78.3	69.19%

In the present study CRP positive in 30.81% of cases. These results are consistent with observations made by Kifah AlQa Qa and Fatin Al-Awayshah in their study [7].

Table 31: Organisms isolated in Baby's blood culture

Organism	Asinidi A Asindi et al.	Shubeck et al.	Present study
Klebsiella	13%	14%	40.6%
Staphylococcus	-	50%	31.2%
E.coli	-	-	18.8%
Pseudomonas	11.3%	4%	9.4%
Coagulate negative Staphylococcus	29%	-	0

Shubeck et al. observed growth of Staphylococcus in 50% of cases followed by Klebsiella in 14% of cases and Pseudomonas in 4% of cases [9]. Asindi A Asindi et al. isolated coagulate negative Staphylococcus in 29% cases, Klebsiella in 13% and Pseudomonas in 11.3% cases [15].

In the present study Klebsiella (40.6%) was the most common organism causing sepsis followed by Staphylococcus (31.2%), E.coli (18.8%) and Pseudomonas (9.4%).

Summary

The present prospective study includes 185 cases of neonates born to mothers with PROM of more than 12 hours duration delivered in Sangameshwar Hospital and Basaveshwar General and Teaching Hospital attached to M.R. Medical College, Gulbarga from December 2013 to May 2015.

1. Incidence of PROM is 4.12%.
2. 44.32% were males and 55.68% were females.
3. 33.51% of the total neonates were born by normal vaginal delivery and 66.49% were delivered by cesarean section.
4. 49.19% of the cases had Premature rupture of membranes of 12-18 hrs duration,

21.62% cases had Premature rupture of membranes of 18-24 hrs, 19.46% Premature rupture of membranes and 9.73% cases had Premature rupture of membranes of more than 48 hr.

5. Most common organism isolated in maternal genitalia by cervical swab culture was Klebsiella (11.89%) followed by Staphylococcus (8.10%), E.coli (7.02%) and Pseudomonas (1.62%).
6. RDS was the most common clinical manifestation (18.92%) followed by septicemia (15.14%) and pneumonia 1.62%.
7. Out of 185 cases 64.32% neonates were asymptomatic and 35.68% were symptomatic.
8. Neonatal morbidity was more common in preterm babies. RDS was the Commonest clinical presentation in these babies.
9. The incidence of septicemia was 8.3%.
10. The incidence of septicemia was more in Premature rupture of membranes of longer duration.
11. The incidence of neonatal deaths was 1.08% out of 185 neonates born to mothers with PROM of more than 12 hours duration.
12. CRP was positive in 30.81% of cases.
13. Out of 185 cases 9.19% had leucopenia and 11.35% had leucocytosis.
14. Most common organisms isolated in blood culture were Klebsiella followed by, Staphylococcus E.coli and Pseudomonas.
15. There was a correlation between organisms isolated from maternal genital tract and baby's blood.

Conclusions

- Premature rupture of membranes is a high-risk Obstetric condition. Active management is needed to enable delivery within 18 hrs of premature rupture of membranes as it offers better neonatal outcome.
- Premature rupture of membranes though common in term patients, is not responsible for increased maternal and fetal morbidity and mortality in them.
- Premature rupture of membranes is responsible for increased perinatal morbidity among preterm neonates.
- Morbidity increases as the duration of premature rupture of membranes increases.
- There was a strong correlation between organisms isolated from maternal genital tract and organisms isolated from blood in babies with early onset sepsis.
- Advances in care of preterm babies may reduce the perinatal mortality following premature rupture of membranes, the ultimate solution lies in prevention of premature rupture of membranes before term.

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