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Original Article

Outcome of Neonates in Mothers Having Premature Rupture of Membrane (Prom) At Tertiary Care Hospital

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ABSTRACT

Background: Premature rupture of membranes (PROM) is the rupture of the fetal membranes before the onset of labor. Premature rupture of membranes (PROM) is one of the most common problems in Obstetrics complicating approximately 5-10% of term pregnancies. Complications related to PROM are reparatory distress, necrotizing enterocolitis, intraventricular hemorrhage and sepsis. The knowledge of incidence of early onset sepsis in relation to PROM and its effect on neonatal outcome is essential in order to prevent the neonatal morbidity and mortality.

Methods: The present study was a single-center, observational Study conducted on patients admitted with neonates, mother with rupture of membrane. Irrespective of treatment and in the department of Paediatrics, Sri Siddhartha Medical College hospital and Research Centre, Tumkur from January 2020 to July 2022. Prior initiation of the study obtained Ethical and Research Committee clearance from Sri Siddhartha Medical College hospital and Research Centre, Tumkur. During present study total 165 neonates were reviewed in OPD/IP, among 85 patients were enrolled into the study according present study inclusion criteria and 80 patients were excluded according exclusion criteria.

Results: Most neonates had maternal age of 21-25 years (51.76%).Most neonates in the study were born in primigravida (61.18 %).Most neonates were born with booked appointments (80 %). Most subjects were born through normal vaginal delivery (57.65 %). Most of the study subjects had gestational age of 35-36 weeks (41.17%). Most subjects had latency period of 0-24 hours (56.47 %). Most of the subjects were males (54.11 %). Most of the subjects' weight at birth was 2-2.5 kg (51.76 %). Most of the subjects required admission into NICU (56.47 %). Common neonatal complication in PPROM encountered in our study jaundice; respiratory distress syndrome; hypoglycemia; hypothermia; septicemia and IVH. Most of the subjects had no complications (65.88 %). Common complications occurred during hospital stay in the present study were decreased activity, fever, feeding difficulties, apenic spells, abdominal distension, convulsions and bleeding. Most of the subjects had normal CBC reports (64.71 %). Most of the subjects had normal CRP reports (72.94 %).

Key Words: *Neonates, PROM, Maternal*

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INTRODUCTION

Premature rupture of the membranes (PROM), membrane rupture before the onset of labor, occurs in 2% to 18% of pregnancies. Preterm PROM (PPROM) PROM before 37 weeks' gestation, accounts for 20% to 40% of PROM, and the incidence is doubled in multiple gestations [1]. Preterm premature rupture of fetal membranes (PPROM) affects 2–4 % of pregnancies accounting for 25 % of preterm birth. Maternal, fetal, and neonatal complications resulting from this condition are significant including chorioamnionitis, fetal loss, pulmonary hypoplasia and complications of extreme prematurity among surviving infants. The latency period in PPROM is inversely related to the gestational age thereby increasing the risks of oligohydramnios and infection in very premature infants and their mothers [2]. Neonatal complications after PROM are inversely related to the gestational age at the time of rupture and at delivery. The fetal and neonatal complications of PPROM include infections and fetal distress due to umbilical cord compression, Respiratory Distress syndrome (RDS), necrotizing enterocolitis, intraventricular hemorrhage, sepsis and pulmonary hypoplasia, and an overall increase in the perinatal morbidity and mortality rate. Neonatal sepsis is encountered in 1-10 per 1,000 live births in developed countries and is believed to be three times higher in developing countries [3]. The primary outcome was the development of neonatal sepsis within 7 days. The secondary outcomes included admission to the special care nursery or the pediatric general ward with neonatal sepsis, and neonatal deaths [4]. As for asymptomatic neonates, management depends on gestational age and other risk factors, mainly GBS, intrapartum antibiotic coverage, and laboratory tests results [5]. This study examines the impact of PROM on the neonate including fetal distress, prematurity, infection, pulmonary hypoplasia and restriction deformations.

AIM & OBJECTIVES

To evaluate the Outcome of neonates in mothers having premature rupture of membrane(PROM) at tertiary care hospital and to identify the clinical outcomes among the neonates and the incidence of early onset sepsis following PROM among the admitted cases to NICU and also to identify the predictors affecting clinical outcomes among the neonates.

MATERIALS AND METHODS

The present study was a single-center, observational Study conducted on patients admitted with neonates, mother with rupture of membrane. Irrespective of treatment and in the department of Paediatrics, Sri Siddhartha Medical College hospital and Research Centre, Tumkur over a period of 22 months from January 2020 to July 2022. Prior initiation of the study obtained Ethical and Research Committee clearance from Sri Siddhartha Medical College hospital and Research Centre, Tumkur. During present study total 165 neonates were reviewed in OPD/IP, among 85 patients were enrolled into the study according present study inclusion criteria and 80 patients were excluded according exclusion criteria. All outborn& inborn neonates born to mothers with PROM are included in the study and patients with Antepartum hemorrhage, Before 28 weeks of gestation, Chronic Maternal Medical disease, Neonates with Major congenital malformations, Toxemia of pregnancy, Not giving consent were excluded from the study. Cases selected from the patients with neonates, mother with rupture of membrane, after taking consent, were analyzed clinically and radiologically. All the patients selected for the study was examined according to protocol, clinical and laboratory investigations were carried. All the patients fulfilled selection criteria were explained about the details of the disease process, options of treatment, ultimate outcome, possible effects, complications and chances of recurrence in both procedure and a written informed consent was obtained before enrollment. All the data was collected from the patients admitted in the department of paediatrics wards with neonates, mother with rupture of membrane and those patients who attended in-patients and out-patient department with detailed history & thorough physical examinations. It included age, sex, nationality, complaints, and duration of symptoms. Telephone contact numbers and detailed address were collected for follow up. The collected data was entered into Microsoft Excel Worksheet-2010 and data was taken into IBM SPSS Statistic for windows, version 24(IBM Corp., Armonk, N.Y., USA) software for calculation of frequency, percentage, mean, standard deviation and Probability value.

Observations and Results

Of the total 75 patients,39 patients are in the age group of 51-65 years (52%) ,20 patients are in the age group of 41-50 years (26.7%) 16 patients are in the age group of 31-40years (21.3%). The mean age of the patients is 49.04.

Table 1: Newborn were distributed according to maternal age group

Age Group	No. Of Patients	Percentage
≤20	7	8.23
21-25	44	51.76
26-30	21	24.71
31-35	13	15.29
Total	85	100

Table 2: Newborn distributed according to gravid

Gravida	No. Of Patients	Percentage
Multi gravida	33	38.82
Primi gravida	52	61.18
Total	85	100

Table 3: Newborn were distributed according to gestational age:

Gestational Age	No. Of Patients	Percentage
28-31weeks	9	10.58
32-34 weeks	26	30.59
35-36 weeks	50	58.82
Total	85	100

Table 4: Newborn according to gender

Gender	No. Of Patients	Percentage
Male	46	54.11
Female	39	45.89
Total	85	100

Table 5: Subjects were distributed according to latency period

Latency period (in hours)	No. Of Patients	Percentage

0-24	48	56.47
25-72	22	25.88
>72	15	17.65
Total	85	100

Table 6: Neonates were distributed

NICU admission	No. Of Patients	Percentage
Yes	37	43.53
No	48	56.47
TOTAL	85	100

According to NICU admission

Table 7: Subjects were distributed according to birth weight

Birth weight (kg)	No. Of Patients	Percentage
<1.5	5	5.88
1.5 – 2.0	9	10.59
2-2.5	44	51.76
>2.5	27	31.76
Total	85	100

Table 8: Neonates distributed according to CRP report

CRP reports	No. Of Patients	Percentage
Normal	62	72.94
Abnormal	23	27.06
Total	85	100

Table 9: Subjects were distributed according to CBC report

CBC reports	No. Of Patients	Percentage
Normal	55	64.71
Abnormal	30	35.29
Total	85	100

Table 10: Newborn were distributed according to neonatal complication in PPROM:

Neonatal Complication	No. Of Patients	Percentage
Respiratory Distress syndrome	10	11.76
Septicemia	5	5.88
Hypothermia	6	7.06
Hypoglycemia	8	9.41
Jaundice	11	12.94
IVH	2	2.35
No Complication	56	65.88
TOTAL	85	100

Table 11: Newborn were distributed according to complication during hospital stay

Neonatal Complication during Hospital stay	No. Of Patients	Percentage
Fever	23	27.06
Decreased activity	31	36.47
Apenic spells	16	18.82
Abdominal distension	6	7.05
Feeding difficulties	19	22.35
Convulsions	4	4.70
Bleeding	2	2.35

DISCUSSION

In the present study, the subjects were categorized into four maternal age groups with an interval of 5. Most of the study subjects had gestational age of 35-36 weeks, i.e., 35 subjects (41.17%); followed by 23 subjects with gestational age of 32-34 weeks (27.05%), 21 subjects with gestational age of >36 weeks (24.70%) and finally 6 subjects with gestational age of 28-31 weeks (7.05 %). The results of our study were in co-relation with the past studies conducted by Mercer BM et al [6] **(**21-25 years (52 %). Most neonates in the study were born in primigravida i.e., 61.18 % subjects,

followed by 38.82 % subjects in multigravida. The results of our study were in co-relation with the past studies conducted by Shucker J Ln et al Primi [7] (Primigravida65 %), Louis JM et al [8] (Primigravida 63 %). Most subjects were born through normal vaginal delivery, i.e., 57.65 % subjects; followed by 29.41 % subjects thorough LSCS and finally 12.94 % subjects with outlet foreceps. The results of our study were in co-relation with the past studies conducted by Natale R et al [9] (Normal Vaginal Delivery 58 %), Jairam VK et al [10] (Normal Vaginal Delivery 57 %), Kenyon S et al [11] (Normal Vaginal Delivery (55 %). Most of the study subjects had gestational age of 35-36 weeks, i.e., 58.82 %; followed by 30.59 % subjects with gestational age of 32-34 weeks and finally 10.58 % subjects with gestational age of 28-31 weeks. The results of our study were in co-relation with the past studies conducted by Gunn GC et al [12] (35-36 weeks 55 %). Most subjects had latency period of 0-24 hours, i.e., 56.47 % subjects; followed by 25.88 % subjects with latency period of 25-72 hours and finally 17.65 % subjects with latency period of > 72 hours. The results of our study were in co-relation with the past studies conducted by Gunn GC et al [13] (0-24 hours 56 %). Most of the subjects were males, i.e., 54.11 % subjects followed by females 45.89 % subjects. The results of our study were in co-relation with the past studies conducted by Horst Will et al [14] (Males 51 %), Gomez R et al [15] (Males 55 %). Most of the subjects' weight at birth was 2-2.5 kg, i.e., 51.76 % subjects; followed by 31.76 % subjects with > 2.5 kg; 10.59 % subjects with1.5 – 2.0 kg and finally 5.88 % subjects with <1.5 kg. The results of our study were in co-relation with the past studies conducted by Horst Will et al [16]. (2-2.5 kg 55 %). Most of the subjects required admission into NICU, i.e., 56.47 % subjects followed by 43.53 % subjects who were not admitted. The results of our study were in co-relation with the past studies conducted by Barabas AP et al [17] (Yes 55 %). Most of the subjects had no complications, i.e., 65.88 % subjects followed by 12.94 % subjects with jaundice; 11.76 % subjects with Respiratory Distress syndrome; 9.41 % subjects with hypoglycemia; 7.06 % subjects with hypothermia; 5.88 % subjects with septicemia and finally 2.35 % subjects with IVH. The results of our study were in co-relation with the past studies conducted by Barabas AP et al [17], Naeye RI et al [18], Asrat T et al [19]. Most of the subjects had normal CBC reports i.e., 64.71 % subjects followed by 35.29 % subjects with abnormal CBC reports. The results of our study were in co-relation with the past studies conducted by Alexander JM et al [20]. Most of the subjects had normal CRP reports, i.e., 72.94 % subjects; followed by 27.06 % subjects with abnormal CRP reports. The results of our study were in co-relation with the past studies conducted by Alexander JM et al [20]. Most of the subjects had decreased activity, i.e., 36.47 % subjects; followed by 27.06 % subjects with fever; 22.35 % subjects with feeding difficulties; 18.82 % subjects with apenic spells; 7.05 % subjects with abdominal distension; 4.70 % subjects with convulsions and finally 2.35 % subjects with bleeding.The results of our study were in co-relation with the past studies conducted by Barabas AP et al [17], Naeye RI et al [18], Asrat T et al [19].

CONCLUSION

Preterm Premature Rupture of Membranes (PPROM) is associated with an increased risk of prematurity and neonatal infections. Management of cases with PPROM is a relatively common but often perplexing problem faced by obstetricians. Despite keeping abreast of contemporary literature regarding this issue and advances in perinatal care, PPROM has potentially adverse implications on maternal and fetal wellbeing. There appears to be various inconclusive studies in the literature. The longer the duration from membrane rupture to delivery, the more the risk of neonatal complications. Preterm PROM is associated with an increased duration of the latency period. Early recognition and prompt management can reduce delays in intervention and also reduce risks of neonatal complications. Antenatal diagnosis to prevent PROM by identifying the risk factors is an important tool in management. Steroid for fetal lung maturity, antibiotics to prevent fetal and maternal infection, induction and/or augmentation of labor in due time (within 24 hours of PROM) and skilled NICU support will speed delivery, reduce hospital stay and infection as well as decrease maternal morbidity and perinatal morbidity and mortality.

Conflict of Interest and Financial Support – NIL

Ethical approval -- The study was approved and ethical clearance taken from the Ethics committee, Sri Siddhartha Medical College, Tumkur , Karnataka.

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