THE STUDY OF MATERNAL RISK FACTORS AND OUTCOME AMONG PRETERM NEONATES

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ABSTRACT **Background:** Association of maternal &fetal factors with preterm delivery is well known, but studies have reported variable degree of relationship between them, hence the present study was done. **Methods and Materials:** The present study is a Prospective Observational study conducted at Prathima Institute Of Medical Sciences, Nagunur, Karimnagar ,Telangana.During the period of 2 years between December 2020 and November 2022. Preterm babies born in Prathima Institute Of Medical Sciences before 37 weeks of gestational age.All maternal risk factors for preterm delivery were analysed and babies morbidity & mortality was studied.

Results :
- The study group consisted of 70 preterm babies of which 54 (77.1%) were AGA babies & 16 were(22.9%) SGA babies. Female babies (n=38) 54.3%out numbered male babies (n=32) 45.7% by birth.
- Pre-eclampsia 25.8% (n=16), PROM 19.3% (n=12) , PIH 12.9% (n=8) and multiple pregnancy 11.2% (n=7) contributed as major maternal and fetal risk factors for preterm delivery.
- Out of 62 mothers , 11mothers (17.7%) had previous bad obstetric history of which previous history of abortions n=6 (9.7%) had strong association with preterm birth.
- Neonatal jaundice n=38(54.3%), RDS n=37 (52.8%), Early Onset Sepsis 15 (21.4%) were the common neonatal morbidities in this study.
- 11 babies (34.4%) ≥34 weeks and 7babies (18.4%) <34 weeks had no morbidity.
- The overall mortality rate was 12.8%(n=9) of which RDS 44.5%(4/9), perinatal asphyxia 33.3%(3/9) and Early Onset Sepsis 11.1% (1/9)were the most common causes.

Conclusion:
- There was a significant relationship between gestational age & outcome indicating that survival was better as gestational age advanced.
- Most of the risk factors are identifiable and treatable. Hence early identification & timely intervention helps in reducing the number of preterm deliveries. This can be achieved by prenatal care in the form of regular ANC, adequate nutrition, better hygiene practices, education of mothers & improved medical facilities.

KEYWORDS : Preterm babies , Maternal risk factors, morbidity , mortality.

INTRODUCTION:

Preterm birth is one of the major clinical problems in obstetrics and neonatology as it is associated with perinatal mortality, serious neonatal morbidity and in some cases childhood disability.

Preterm labour is defined as the onset of labour prior to 37 completed weeks of gestation i.e., 259 days from first day of last menstural period.

The common maternal risk factors having impact on fetal outcome are: a)pre-eclampsia, b) chronic medical illness like heart disease, renal disease, C)UTI, d)bacterial vaginosis, e) chorioamnionitis, f) drug abuse, g) PROM, h) polyhydramnios, i) placenta previa, j) abruption placentae, k) bicornuate uterus, l) incompetent cervix (premature dilatation), iatrogenic & trauma.

The survival of preterm babies especially when born less than 34 weeks of gestation require to remain in NICU. They need to spend time in NICU till close to term to allow for sufficient multiorgan maturation there by resulting in prolonged hospital stay for both mother and infant.

Therefore the consequence of preterm birth often continue beyond the neonatal period and can lead to significant direct and indirect costs that have to be born by parents and society.

Aims & objectives :
1. Study of maternal risk factors associated with preterm birth.
2. Study of outcome of preterm babies during their stay in hospital.

METHODS:
This study was conducted in a Tertiary hospital in Telanganaie.,Prathima Institute Of Medical Sciencesamong preterm neonates to study the maternal risk factors associated with preterm birth and outcome of preterm babies .

Study Design :
Prospective Observational study.

Sample Size :
70 preterm babies.

Study Period:
24months (from December 2020 to November 2022)

Inclusion Criteria:
1. Preterm babies born in PIMS hospital < 37weeks of gestational age.
2. Preterm babies who are small gestational age (SGA), appropriate for gestational age (AGA), large for gestational age(LGA).

Exclusion Criteria:
1. All babies who were referred from outside.
2. Babies born to unbooked maternal cases.

METHOD OF DATA COLLECTION:
• Inborn preterm babies admitted in NICU.
• Gestational age was calculated from mothers LMP and New Ballard score.
• Babies were weighed using electronic weighing machine present in our NICU with standard error of ±5grams.
• Babies were categorised into small for gestational age (SGA), appropriate for gestational age (AGA) and large for gestational age (LGA) by plotting on intrauterine weight chart for both the genders.

Babies were analysed for the following factors till discharge:
• Weight of babies
• Gender of babies
• Asphyxiated babies requiring Ventilatory Support
• Morbidity pattern of babies
• Mortality of babies.
• Causes of mortality of babies.

Mothers of preterm babies were analysed for the following factors:
• Age of the mother
• Antenatal care
• Maternal diseases
• Treatment profile
• Delivery outcome

ANALYSIS:
• Appropriate tables and graphical representations were used to display the data.
• Data analysis was done using ANOVA T test, and Chi-square test.
• And the test is applied to check the difference between the groups
• p value < 0.05 was taken to denote significant relationship.

RESULTS:
• A total of 70 preterm babies were recruited for the study and all 70 were analysed. There were 55 singleton pregnancies and 7 multiple pregnancies (6 twins+1 triplet) hence a total of 62 mothers were analysed .
• The number of female babies delivered 54.3(n-38) out numbered the male 45.7(n=32) babies.
• 45.7% (n=32) of babies were born late preterm.54.3% (n=38)of babies born early and extremely preterm.

Maternal Risk Factors:
• There are many risk factors for preterm birth of which 11 mothers (17.7%) had previous bad obstetric history of which the most common was previous abortions n=6 (9.7%) followed by previous preterm labour n=2(3.2%) & previous still births n=2 (3.2%).
• Maternal medical conditions during the present pregnancy contributing to preterm delivery are pre-eclampsia (n=16) 25.8% being the most common in our study followed by PROM (n=12)19.3%, PIH(n=8) 12.9%, multiple pregnancy(n=7) 11.2% and nutritional anemia (n=5) 8.1%.

Morbidity pattern of preterm babies:
• Out of 70 (100%) preterm babies, 18 (25.7%) had no

morbidity & the rest 52(74.3%)had a single problem or a combination of problems of which neonatal jaundice 54.3% (n=38) was the most common morbidity and all 38 babies (100%) received double surface phototherapy. Respiratory Distress Syndrome (RDS) was present in 37 babies (52.8%) of which 7 babies (10%) required ventilator support and received surfactant.
• 15 babies (21.4%)had early onset sepsis & were treated accordingly. 10 babies (14.3%) had metabolic abnormalities of which 8 babies (11.4%) had hypoglycemia& 2 babies (2.9%)had hypocalcemia. 9 babies (12.9%) had perinatal asphyxia , 5 babies (7.1%)were diagnosed with congenital heart disease in the form of PDA/ASD/acyanotic CHD.
• All these factors also contribute to preterm mortality of which RDS (n=4) 44.5%was the most common cause of preterm mortality followed by perinatal asphyxia (n=3) 33.3% and sepsis (n=1) 11.1%.
• 11(34.4%) late preterm babies had no significant morbidity and were discharged without any complications compared to early and extremely preterm babies 7 (18.4%). 31 (81.6%) early and extremely preterm babies had morbidity compared to late preterm babies 21 (65.6%) . There is a statistically significant relationship between the two variables (p=0.025).

Mortality pattern of preterm babies:
Out of 9 deaths (100%) , 3(36.7%) deaths were extremely preterm babies and 6 (66.7%) deaths were early preterms and 0(0%)were late preterms.

Table 1: Babies Born In Various Gestational Ages

Gestational age(wks)	Babies	
	No.ofcases	%
23-25	1	1.4
26-28	4	5.7
29-31	8	11.4
32-34	25	35.8
35-37	32	45.7
Total	70	100

Table 2 : Maternal Medical Condition And Fetal Risk Factors

Riskfactor	Mother	
	No.	%
Maternal		
1)Pre-eclampsia	16	25.8
2)PIH	8	12.9
3)Eclampsia	1	1.6
4)NutritionalAnaemia	5	8.1
5)PROM	12	19.3
6)UTI	3	4.8
Uterine		
1)Cervicalincompetence	2	3.2
ii)Fetal		
1)Multiplepregnancy	7	11.2
2)APH	1	1.6

Table 3: Previous Bad Obstetric History And Outcome Of Babies

BOH	Alive		Dead	
	No.	%	No.	%
Present	9	81.8	2	18.2
Absent	52	88.1	7	11.9
'p'	1.57 Not Significant			

Table 4: Morbidity Pattern Of Preterm Babies

	Morbiditypattern	Babies	
		No.	%
1	RespiratoryDistressRDS	37	52.8
2	PerinatalAsphyxia	9	12.9
3	Pretermcare	5	7.1
4	NeonatalJaundice	38	54.3

5	Metabolicabnormalities	10	14.3
6	Congenitalmalformations	5	7.1
7	Congenitalheartdisease	5	7.1
8	EarlyOnsetSepsis	15	21.4

Table 5: Causes Of Mortality

Causes	Mortality	
	No.	%
RDS	4	44.5
Perinatalasphyxia	3	33.3
Sepsis	1	11.1
Others	1	11.1
Total	9	100

Table 6: Morbidity Of Preterm Babies In Different Gestational Age

Gestational age	Nomorbidity		Withmorbidity	
	No.	%	No.	%
<34weeks	7	18.4	31	81.6
≥34weeks	11	34.4	21	65.6
''p'	0.0184 Significant			

Table 7: Gestational Age And Outcome Of Babies

Gestationalage(wk)	Alive		Dead	
	No.	%	No.	%
23-25wk	0	0	1	100
26-28wk	2	50	2	50
29-31wk	4	50	4	50
32-34wk	23	92	2	8
35-37wk	32	100	0	0
'p'	0.001 Significant			

DISCUSSION

Incidence of preterm delivery varies between countries. It is 12.3% in a study by martinet (USA)[2], 7% by Bibby et al (UK)[3], 5.5% by Robert et al (Australia)[4],while in India it varies between 10–69%. In a study by Singh uma et al it was reported as 20.9%.

Maternal Health And Fetal Outcome:

In this study, the most common factors are pre-eclampsia 25.8%, followed by PROM of 19.3%,PIH 12.9% & multiple pregnancy 11.2%.While in Singh uma et al[1] study, PROM (25.9%) followed by UTI (8.4%) was found to be the major riskfactor for preterm labour.

Similar to other studies, we found gestational hypertension, previous preterm delivery; anemia, multiple pregnancy were other common associations with preterm labour[5].

Morbidity pattern of preterm babies:

The most common morbidity in this study was neonatal jaundice (n=38) of which 38 babies required double surface phototherapy, 37 babies had RDS of which 7 babies required ventilator support, 15 had early onset sepsis, 8 had hypoglycemia which was comparable to a study by Arvind sehgal et al, where neonatal jaundice(78%), RDS (65%) and hypoglycaemia (38%) were the most common causes of morbidity where as in a study by Singh Uma et al Septicemia(16.8%), HIE (9.2%) were the 2 important causes of neonatal morbidity.

Mortality of preterm babies:

In this study, the causes for the mortality are RDS (44.5%), Perinatal asphyxia (33.3%) and Sepsis (11.1%), which was similar to the study by Singh uma et al, it was RDS (62%) Septicaemia (16.8%) and Hypoxic ischaemic encephalopathy (9.2%).

CONCLUSION :

• Prospective observational study group consisted of 70 preterm babies delivered in Prathima institute of medical sciences
• Pre-eclampsia (25.8%) , PROM (19.3%) , PIH (12.9%)and

multiple pregnancy (11.2%) contributed as major maternal medical riskfactors.
• Neonatal jaundice (54.3%) was the commonest morbidity in this study followed by RDS (52.8%) , early onset sepsis (21.4%) & metabolic abnormalities (14.3%). 38 babies received double surface phototherapy.7 babies with RDA also received surfactant therapy.
• The overall mortality rate was 12.9%.
• RDS(44.5%), severe prenatal asphyxia (33.3%) and early onset sepsis(11.1%) are the most common causes of mortality in this study.
• With increase in gestational age there was a reduction inmorbidity and mortality rate in this study. There existed a statistically significant relationship between these two variables.

Hence it is a time felt need to identify the risk factors & intervene early to reduce the preterm deliveries and their associated morbidity & mortality. This can be achieved by:
1. Booking of all pregnant mothers for regular ANC & follow up for early identification of risk factors (maternal and fetal).
2. Education of mothers regarding adequate nutrition , better hygiene practices and regarding symptoms of maternal diseases and preterm delivery.
3. Early identification & treatment of neonatal morbidities associated with preterm babies.

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