

## The Study of Risk Factors and Perinatal outcome in Preterm Birth

Sowmya S.<sup>1</sup>, Bhavana S.<sup>2</sup>, Ambarisha Bhandiwad<sup>3</sup>

### Abstract

Prevalence of preterm birth is 5-10% of all the pregnancies. Preterm labour is a significant obstetric problem, has a major impact on neonatal mortality and morbidity. It turns a pregnancy into high risk situation which can be detrimental for both mother and the baby. Hence the current study intends to identify the risk factors and the outcome of preterm birth. *Objective:* 1. To identify the risk factors associated with preterm deliveries. 2. To assess the neonatal morbidity and mortality associated with preterm birth. *Materials and Methods:* A descriptive study was undertaken at JSS Hospital, Mysore for one year. The data was collected from the subjects satisfying the inclusion criteria. Data regarding general information, associated risk factors, delivery outcome of antenatal women and also morbidities & mortality of all preterm babies were collected. *Results:* A total of 1748 deliveries in our hospital 148 were preterm deliveries. Incidence of preterm deliveries is 8.5%. The factors significantly associated are preeclampsia (odds ratio [OR] 5.25) uterine anomalies (OR 5.50), cervical incompetence (OR 4.97), preterm premature rupture of membranes (OR 3.73), antepartum haemorrhage (OR 3.54), multiple gestation (3.12), multigravida (OR 1.67), low socioeconomic status (OR 1.73), education status upto high school (OR 0.34). Perinatal

morbidity noted is 69% with 80% babies seeking NICU Care. Significantly associated morbidities seen in preterm babies are hyperbilirubinemia (OR 8.14), septicaemia (OR 6.19), respiratory distress syndrome (OR 4.49), intra uterine fetal demise (OR 5.06), intra uterine growth restriction (OR 2.06). It is mostly seen in babies of gestational age 31-34 weeks (35.14%). Perinatal mortality is 11.4%. *Discussion & Conclusion:* Early identification of risk factors, diagnosis of preterm labour, use of prophylactic pharmacologic therapy to prolong gestation like tocolytic therapy when indicated, and systematic maternal and fetal surveillance and patient education will go a long way in improving outcome of preterm infants.

**Keywords:** Preterm Birth; NICU; Low Birth Weight; Tocolytic Therapy.

### Introduction

Preterm labour is onset of labour prior to completion of 37 weeks of gestation and preterm birth is a major challenge in perinatal health care and yet an unmet challenge.

Prevalence of preterm birth is 5-10% of all the pregnancies [1]. Despite great deal of research and introduction of new diagnostic and therapeutic technology, the rate of preterm birth has not changed.

The risk factor includes low, socio economic status, age, parity, socio economic status, education, small intervals between birth are affecting variables [3] increase in multiple pregnancies [4], 30% preterm birth with rupture of membranes [5].

India has very high incidences of preterm labour at 23.3% [4].

<sup>1</sup>Assistant Professor,  
Department of Obstetrics  
& Gynaecology,  
Basaveshwara Medical  
College, Chitradurga,  
Karnataka 577502, India.  
<sup>2</sup>Junior Consultant,  
Motherhood Hospital,  
Hebbal, Bengaluru,  
Karnataka 560092, India.  
<sup>3</sup>Professor and Unit Chief,  
Department of Obstetrics &  
Gynaecology, JSS Medical  
College and Hospital,  
Mysuru, Karnataka  
570015, India.

**Corresponding Author:**  
**Sowmya S.,**  
Assistant Professor,  
Department of Obstetrics  
& Gynaecology,  
Basaveshwara Medical  
College, Chitradurga,  
Karnataka 577502, India.  
E-mail:  
sowmyas.1512@gmail.com  
**Received on** 18.07.2018,  
**Accepted on** 31.08.2018

Currently it is a challenging problem for both obstetrician and neonatologist as it takes heavy toll of perinatal morbidity and mortality 50-70% [1].

The focus of this study is to identify the risk factors of preterm labour and to assess the morbidity and mortality of preterm babies.

#### Objective

1. To identify the risk factors associated with preterm birth.
2. To assess the neonatal morbidity and mortality associated with preterm delivery.

#### Study Design

Descriptive study

#### Materials & Methodology

The study was undertaken at Department of Obstetrics and Gynaecology, JSS Hospital, Mysore for 12 months.

The data was collected from all the inpatient pregnant women satisfying the inclusion criteria.

#### Inclusion Criteria

All antenatal women who give consent for the study.

All cases of preterm labour, presenting to our hospital for 12 months.

#### Exclusion Criteria

All pregnancies with fetal anomaly.

- The maternal factors like age group, parity, socio economic status, occupation, education, stature, body mass index were noted.
- Women with onset of preterm labour associated factors like preeclampsia, uterine anomalies and cervical incompetence are recorded.
- Pregnant women with history of multiple gestation, preterm premature rupture of membranes, antepartum haemorrhage were also taken into account.
- Women with infection (vaginal, urinary tract) medical disorders (GDM, anemia) are noted.
- Previous history of abortion, preterm delivery, previous LSCS are also taken

- In some cases the cause was not known.
- Mode of delivery and gestational age at time of delivery was noted.

#### Perinatal Outcome

- Gestational age, birth weight, NICU admissions
- The perinatal morbidity factors like hyperbilirubinemia, septicemia, IUGR, respiratory distress syndrome were noted in babies admitted to NICU. They were followed up for 1 week.
- Perinatal mortality were also noted.

#### Results

Total number of deliveries in the study period were 1748, among them 148 were preterm deliveries. Occurrence of preterm delivery in our hospital is 8.5%.

Among 148 preterm deliveries, 78 (52.7%) delivered vaginally and 70 (46.6%) delivered by LSCS (Table 1).

Among them 115 (78%) deliveries were spontaneous and 33 (22.3%) were induced (Table 2).

Factors which were significantly associated with preterm delivery were multigravida (odds ratio (OR) 1.67: p value 0.0031), lower middle class (OR 1.73: p value 0.0143), education high school (OR 1.34: p value 0.000) (Table 3).

Pregnancies in the age groups of 18-35 years, stature and body mass index are not significantly associated with preterm delivery in our hospital. The triggering factors for preterm birth noted in our hospital were preeclampsia (odds ratio: 5.25) uterine anomalies (OR: 5.50) and cervical

**Table 1:**

	Pre term	%
Vaginal Delivery	78	52.70
LSCS	70	47.30
Total	148	100.00

**Table 2:**

Delivery	Pre term	%
Spontaneous	115	77.70
Induced	33	22.30
Total	148	100.00

**Table 3:**

	Pre term	%
Primi	54	36.49
Multi	94	63.51
Total	148	100.00

incompetence (OR: 4.97). The risk factors significantly associated were PPRM, antepartum haemorrhage, multiple gestational which had 3-4 times higher chances of preterm birth. Cause was not known in 18 cases (12.16%) (Table 4).

**Table 4:**

	Pre term	%	Odds ratio	P value
Multiple gestation	12	8.11	3.12	0.004
Preeclamsia	27	18.24	5.25	0.000
PPROM	30	20.27	3.73	0.000
APH	16	10.81	3.54	0.000
Medical Disorder in pregnancy(GDM, anemia)	30	20.27	1.67	0.016
Uterine anomalies	3	2.03	5.50	0.034
Cervical incompetence	10	6.76	4.97	0.000

*Perinatal outcome*

Among 148 babies delivered preterm, 120 babies were admitted to NICU. Babies admitted are categorized according to gestation age. Perinatal morbidity 69.9% and mortality 11.49% (Table 5).

**Table 5:**

	Pre term	%
Morbidity	103	69.59
Mortality	17	11.49
Total	148	100.00

**Table 6:**

	Pre term	%
31-34 weeks	52	35.14
>34 weeks	40	27.03
<30 weeks	28	18.92
<1500 grams	23	15.54
Total	148	100.00

**Table 7:**

	Pre term	%	Odds Ratio	P value
NICU	120	81.08		
IUGR	15	10.14	2.06	0.0123
IUD	17	11.49	5.06	0.000
RDS	23	15.54	4.49	0.000
Hyperbilirub inemia	80	54.05	8.14	0.000
Septicemia	48	32.43	6.90	0.000

Morbidity was more in the babies born less than 34 weeks of gestation (Table 6).

The frequency of the morbidity reduced with increase in gestational age. The factors noted in perinatal outcome which were significantly associated were hyper bilirubenemia, septicemia has 6 to 8 times more chances in preterm babies. Respiratory distress syndrome, intrauterine growth restriction, intrauterine death are 4-5 times more in preterm deliveries. (Table 7).

**Discussion**

After analyzing the present study the following conclusions are drawn. Incidence of preterm birth in our hospital is 8.5%. Among preterm deliveries in our hospital 52.7% delivered vaginally and 47.3% delivered by LSCS and 77.7% delivered spontaneously 22.3% were induced.

Two Fold increase risk is attributable to biologic immaturity influencing nutritional status [8].

Preterm deliveries occurred and less than 4% in mothers younger than 35 year which is almost of the frequency in older mothers [9].

Preterm labour is a significant obstetric problem which requires detection, careful antenatal monitoring, prompt treatment to achieve better perinatal outcome. The factors significantly associated with preterm delivery are uterine anomalies (OR 5.50), preeclampsia (OR 5.25), cervical incompetence (OR 4.97), premature preterm rupture of membranes (OR 3.73), antepartum haemorrhage (OR 3.54), multiple gestation (OR 3.12).

Average gestational age is shorter in twins 36 weeks, triplets 33 weeks quadruplets 31 weeks than it for single terms [10].

The cause of preterm labour PROM 30% [11], Placenta previa [13] associated with post partum haemorrhage, low birth weight, perinatal mortality.

Maternal medical conditions increase risks of preterm birth like GDM Preeclampsia [16-17].

Maternal factors like multigravida (OR 1.67), low socioeconomic status (OR 1.73), education status upto high school (OR 0.34) are significantly associated with preterm delivery.

There was a considerably high morbidity and mortality among babies born preterm. In our study 80% of babies delivered preterm sought NICU care. Majority were of gestational age 31-34 week

(35.14%). Perinatal morbidity noted is 69% and perinatal mortality is 11.4%.

The significant perinatal morbidities observed in preterm babies were hyperbilirubinemia (OR 8.14), septicaemia (OR 6.19), respiratory distress syndrome (OR 4.49), intra uterine fetal demise (OR 5.06), intra uterine growth restriction (OR 2.06). Whenever possible, obstetricians attempt to delay preterm labour, so that gestation can be prolonged and thus improving the neonatal outcome but in most of the cases, it is not possible to prevent preterm delivery.

Increase in preterm birth lead to hyperbilirubinemia 78%, RDS 65%, Leading to Low birth weight [18].

Overall Perinatal mortality Singh et al 21% [19], Singh uma et al. 12.7% [2].

Hence a study of risk factors of pre term labour will help in better understanding of this significant problem so that attempts can be adopted to improve perinatal out come in terms of reducing maternal as well as foetal mortality.

## Conclusion

Preterm labour is a significant obstetric problem, has a major impact on neonatal mortality and morbidity. It turns a pregnancy into high risk situation and increases the need for neonatal resuscitation in delivery room and improved NICU facilities.

Early identification of risk factors, diagnosis of preterm labour, prophylactic pharmacologic therapy to prolong gestation like tocolytic therapy when indicated, and systematic maternal and fetal surveillance and patient education will go a long way in improving outcome of preterm infants.

This report intended to assist academic researchers, funding agencies, health care professionals with prioritization of research activities and to inform the public about problem of preterm birth.

## References

1. Dasgupta S. Preterm labour. In: Immunological basis of pathophysiology Mukherjee OG, Buckshee K eds., 1<sup>st</sup> edn., 1998.pp.4-7.
2. Uma S, Nisha S, Shikha S. A prospective analysis of etiology and outcome of preterm labour. *Journal of Obstetrics and Gynecology India* 2007;57(1):48-52.

3. McCormick MC. The contribution of low birth weight to infant mortality and childhood morbidity. *N Egl J Med* 1985;312:82-90.
4. Kristensen J, Roos JL, Kristensen FB. Idiopathic preterm deliveries in Denmark. *Obstet Gynecol* 1995;85(4):549-52.
5. Ugwumadu A. Preterm labour and delivery - management issues. The management of labour, edited by Arulkumaran, Penna LK, Rao KB 319-329, vention of preterm birth.
6. Goldenberg RL. The management of preterm labour. *J Obstet Gynecol* 2002 Nov;100(5 Pt 1):1020-37.
7. Americal College of Obtetrician and Gynecologists. Preterm labour Technicalbulletin No.206. Washington DC: ACOG, 1995.
8. Hediger ML, Scholl TO, Schall JI, Krueger PM. *Annals of epidemiology* 1997 Aug;7(6)400-6.
9. Astolfi P, Zonta LA. Risks of preterm delivery and association with meternal age, birth order and gender. *Hum Reprod.* 1999 Nov;14(11):2891-4.
10. Cunningham FG, Gant NF, Leveno KJ, Bilstrap LC III, Haulth JC, Wenstrom KD, eds. *Williams obstetrics*, 21<sup>st</sup> edn., New York, McGraw Hill, 2001.p.780.
11. Van der pool BA. Preterm labour diagnosis and treatment. *Am Acad Fam physician* 1998;15:866.
12. Totowa NJ. Current clinical practice. *Obstetrics in family medicine. A practical guide* by P. Lyons. Humana Press. 2006.
13. Pritchard JA, Mason R, Corley M, Pritchard S, Genesis of severe placental abruption. *Am J Obstet Gynecol* 1970 Sept;108(1):22-7.
14. Zlatnic Marya G.Chenge Yvonne Co. Norton Mary E, Thiet Marie Paul, Caughey Aaron B. Placenta previa and the risk of preterm delivery. The journal of maternal fetal and neonatal medicine, the official journal of European Association of Perinatal Medicine, the Federation of Asia and OCEANIA perinatal societies, the International society of perinatal obstetricians 2007;20(10):719-23.
15. Romero R, Oyarzun E, Mazor M, Sistori M, Hobbins JC, Bracken M, Metaanalysis of the relationship between asymptomatic bacteriuria and preterm delivery/birth weight. *Obstet Gynecol* 1989;73: 576-82.
16. Goldenberg RL, Iams JD, Mercer BM. The preterm prediction study: The value of new Vs standard risk factors in predicting early and all spontaneous preterm births, INCHD MFMU Network. *Am J Public health* 1998;88(2):233-38.
17. Banhidly F, Acs N, Puho EH, Czeizel AE. Pregnancy complications and birth outcomes of pregnant women with urinary tract infection and related drug treatments, *Scandinavian Journal of infectious diseases* 2007;39(5):390-397.
18. Sehgal A, Telang S, Paseah SM. Maternal profile and immediate outcome in extremely low birth weight babies. *Delhi Trop Doct* 2004;34:165-8.

19. Singh D, Varghese PV, Singh S. Outcome of hospitalized out-born preterm babies. Indian J. Matern Child Health 1992;3:4-7.
20. International classification of diseases and related health problems. 10th revision. Geneva: World Health Organization; 1992.
-