

DOI: <https://dx.doi.org/10.18203/2320-1770.ijrcog20205772>

Original Research Article

Maternal outcome in preterm labor in a tertiary care hospital

Preeti Frank Lewis, Ayushi Kumari*, Nitin Bavdekar

Department of Obstetrics and Gynecology, Grant Government Medical College, Mumbai, Maharashtra, India

Received: 08 October 2020

Revised: 16 November 2020

Accepted: 02 December 2020

***Correspondence:**

Dr. Ayushi Kumari,

E-mail: ayushikum@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: To study the fetal and maternal outcome in preterm labor cases.

Methods: It was Prospective, single centered, observational study. All women with preterm labor in the study period i.e. from September 2018 to March 2020 were included in the study i.e. 100 patients.

Results: Out of 100 subjects, majority of mothers 65(65%) were in age group of 21-30 years followed by 23 (23%) in age group of ≤ 20 years. Majority 52 (52%) of study subjects were primigravida followed by 28 (28%) having parity 1. Only one case had parity 4. Majority 36 (36%) of study subjects were in lower class followed by 28 (28%) cases in lower middle class. 23 (23%) cases in middle class and 6 (6%) were in upper class. Maximum 61 (61%) cases were unbooked cases and rest 39 (39%) cases were booked. Out of 90 babies who were < 2500 grams, maximum 57 (63.33%) were low birth weight (less than 2.5 kg) followed by 22 (24.44%) being VLBW babies. 10 cases were ≥ 2.5 kg, which are not LBW babies according to WHO Classification of low birth weight. Majority 34 (47.22%) stayed for 1-10 days followed by 17 (23.61%) babies for 11-20 days. Also 15 (20.83%) babies stayed for 21-30 days.

Conclusions: Compared with term infants, preterm infants are at high risk of overall morbidity and mortality. Clinical suspicion, early detection and correction of risk factors, institutional delivery and good neonatal care back up facilities can improve the outcome of preterm labour and decrease the maternal complications as well.

Keywords: Feto maternal outcome, Preterm labour

INTRODUCTION

WHO defines preterm birth as babies born alive before 37 weeks of pregnancy is completed. It is the leading cause of death worldwide for children below 5 years of age. Many preterm babies survive in high-income countries but in low- and middle-income countries a lack of adequate newborn care puts the lives of many preterm babies at risk.¹

Preterm labor is one of the syndromes characterized by premature activation of final path way of parturition. Preterm labor may either be a physiological process that has occurred too soon or pathological process following an abnormal stimulus. The etiology of preterm labor may be multi-factorial. The earlier the onset of labor the more

likely is that a pathological process is implicated.² Premature babies are at risk of many immediate and long-term complications. Immediate (short term) neonatal morbidity includes respiratory distress syndrome, hypothermia, hypoglycemia, jaundice, intraventricular hemorrhage, necrotizing enterocolitis, bronchopulmonary dysplasia, sepsis and patent ductus arteriosus. Long term morbidity includes cerebral palsy, mental retardation and retinopathy of prematurity. Residual mental and motor handicaps are the major deterrents to the optimal development of preterm infant.²

METHODS

It was prospective, single centered, observational study. All women with preterm labor in the study period i.e.

from September 2018 to March 2020 were included in the study with the following criteria gestational age between 28 to 36 weeks, singleton pregnancy, with intact membrane. In preterm labor with regular uterine contractions at least 3 every 10 minutes, associated with cervical dilatation of at least 1cm but not more than 3cm and cervical effacement less than or equal to 50%, Maternal age >18 years, married mothers and Non medico-legal pregnancy. Patients with premature rupture of membranes, preeclampsia, malpresentations, fetal malformations, polyhydramnios, placenta previa and abruptio placentae, severe anemia, intrauterine fetal death, intrauterine growth restriction, Rh isoimmunization and uterine and cervical anomalies were all excluded from the study.

Statistical analysis

The data was entered in Microsoft Excel sheet and Epi Info software SPSS version 25 and EPI Info version 7.3 was used for analysis, incidence and prevalence of foeto-maternal outcome, demographic, clinical characteristics of pre-term labor were studied.

RESULTS

Out of 100 subjects, majority of mothers 65 (65%) were in age group of 21-30 years followed by 23 (23%) in age group of ≤ 20 years. Mean age was 24.81 ± 4.49 ranging from 19 to 37 years. Majority 36 (36%) subjects were in lower class followed by 28 (28%) cases in lower middle class. 23 (23%) cases in middle class and 6 (6%) were in upper class. Maximum 61 (61%) cases were unbooked cases and rest 39 (39%) cases were booked. Out of 90 babies who were <2500 grams, maximum 57 (63.33%) were low birth weight followed by 22 (24.44%) being VLBW babies. 10 cases were ≥ 2.5 kgs, which are not LBW babies according to WHO Classification of low birth weight. Majority (30) mothers had lactation insufficiency followed by Puerperal sepsis in 24 mothers. Also, 12 mothers had birth canal trauma cervix, vagina and perineum and 8 mothers had post-partum depression and psychosis. Many mothers had more than one complication. Most common complication being lactation insufficiency followed by puerperal sepsis with or without puerperal pyrexia. Out of 100 babies, newborn jaundice was seen in 66 babies followed by Immune system problems in 32 babies. Metabolism acidosis, inborn metabolic error and hypoglycemia was seen in 20 babies. Many babies had multiple complications. Birth asphyxia and respiratory distress was seen in 18 babies. Out of 72 babies who stayed in NICU, 47 were immediately shifted after birth due to low birth weight and remaining 25 were shifted from mother mostly due to jaundice. Majority 34 (47.22%) stayed for 1-10 days followed by 17 (23.61%) babies for 11-20 days. Also 15 (20.83%) babies stayed for 21-30 days. Only 06 (8.34%) babies stayed for >30 days in NICU. Out of 36 total neonatal deaths, maximum 10 (27.78%) babies died due to sepsis followed by 08 (22.22%) due to birth asphyxia.

Out of 36 deaths that occurred, majority i.e. 14 (38.89%) occurred within 3-8 days followed by 12 (33.33%) deaths within 9-14 days.

Table 1: Distribution of preterm cases according to age groups.

Age group (in years)	Number	Percentage
≤ 20	23	23
21-30	65	65
31-40	11	11
Total	100	100

Table 1 shows distribution of preterm cases according to age. Out of 100 subjects, majority of mothers 65 (65%) were in age group of 21-30 years followed by 23 (23%) in age group of ≤ 20 years. Mean age was 24.81 ± 4.49 ranging from 19 to 37 years.

Table 2: Distribution of preterm cases according to parity.

Parity	Number	Percentage
Primigravida	52	52
P1	28	28
P2	13	13
P3	6	6
P4	1	1
Total	100	100

Table 2 shows distribution of preterm cases according to parity. Majority 52 (52%) of study subjects were primigravida followed by 28 (28%) having parity. This was followed by 13 (13%) having parity 2. Only one case had parity 4.

Table 3: Distribution of pre-term cases according to socioeconomic status according to modified Kuppuswamy scale classification.

Socioeconomic class	Number	Percentage
V (lower class)	36	36
IV (lower middle)	28	28
III (middle class)	23	23
II (upper middle)	7	7
I (upper class)	6	6
Total	100	100

Table 4: Distribution of pre-term cases according to registration of case.

Type of case	Number	Percentage
Booked	39	39
Unbooked	61	61
Total	100	100

Table 3 shows distribution of pre-term cases according to socioeconomic status according to modified

Kuppuswamy scale classification. Majority 36 (36%) subjects were in lower class followed by 28 (28%) cases in lower middle class. 23 (23%) cases in middle class and 6 (6%) were in upper class.

Table 4 shows distribution of pre-term cases according to registration of case. Maximum 61 (61%) cases were unbooked cases and rest 39 (39%) cases were booked.

Table 5: Distribution of babies of preterm cases according to WHO Classification of low birth weight.

WHO classification of low birth weight (in grams)	Number	Percentage
≤1000 (ELBW)	11	12.22
1001-1500 (VLBW)	22	24.44
1501-<2500 (LBW)	57	63.33
Total	90	100

*ELBW: Extremely low birth weight; *VLBW: Very low birth weight; *LBW: low birth weight; 10 cases were of weight ≥2500gms.

Table 5 shows distribution of babies of preterm cases according to WHO classification of low birth weight. Out of 90 babies who were <2500 grams, maximum 57 (63.33%) were low birth weight followed by 22 (24.44%) being VLBW babies. 10 cases were ≥2.5 kgs, which are not LBW babies according to WHO Classification of low birth weight.

Table 6: Distribution of pre-term cases according to postnatal complications.

Postnatal complications	Number
Absent	34
Present	N=66
Lactation insufficiency	30
Puerperal sepsis	24
Birth canal trauma - cervix, vagina and perineum	12
Post-partum hemorrhage	10
Retained placenta	4
Episiotomy gape	8
Post-partum psychosis and depression	8

Table 6 shows distribution of pre-term cases according to postnatal complications. Out of 100 cases, 66 cases had postnatal complications. Majority (30) mothers had lactation insufficiency followed by Puerperal sepsis in 24 mothers. Also, 12 mothers had birth canal trauma - cervix, vagina and perineum and 8 mothers had post-partum depression and psychosis. Many mothers had more than one complication. Most common complication being lactation insufficiency followed by puerperal sepsis with or without puerperal pyrexia.

Table 7 shows distribution of babies of pre-term cases according to complications. Out of 100 babies, newborn jaundice was seen in 66 babies followed by Immune

system problems in 32 babies. Metabolism acidosis, inborn metabolic error and hypoglycemia was seen in 20 babies. Many babies had multiple complications. Birth asphyxia and respiratory distress was seen in 18 babies.

Table 7: Distribution of babies of pre-term cases according to complications.

Fetal complications	Number
Newborn jaundice	66
Immune system problems	32
Metabolism acidosis	
Inborn metabolic error	20
Hypoglycemia	
Birth asphyxia	18
Respiratory distress	18
Anemia/Thrombocytopenia	16
Hypothermia	16
Necrotizing enterocolitis	14
Hypoxic ischemic encephalopathy	
Meningitis	14
Seizure disorders	
PDA/ASD/VSD	12
Broncho-pulmonary dysplasia	4

Table 8: Distribution of babies of pre term cases according to duration of NICU stay.

Duration of stay (in days)	Number	Percentage
01-10	34	47.22
11-20	17	23.61
21-30	15	20.83
>30	6	8.34
Total	72	100

Table 8 shows distribution of babies of pre-term cases according to duration of NICU stay. Out of 72 babies who stayed in NICU, 47 were immediately shifted after birth due to low birth weight and remaining 25 were shifted from mother mostly due to jaundice. Majority 34 (47.22%) stayed for 1-10 days followed by 17 (23.61%) babies for 11-20 days. Also 15 (20.83%) babies stayed for 21-30 days. Only 06 (8.34%) babies stayed for >30 days in NICU.

Table 9: Distribution of neonates of pre term cases according to cause of death.

Cause of death	Number N=36	Percentage
Sepsis	10	27.78
Birth asphyxia	8	22.22
Respiratory distress	7	19.44
Metabolic disorders	5	13.89
Neonatal jaundice	6	16.67
Total	36	100

Table 9 shows distribution of babies of pre-term cases according to cause of death. Out of 36 total neonatal

deaths, maximum 10 (27.78%) babies died due to sepsis followed by 08(22.22%) due to birth asphyxia.

Table 10: Distribution of babies of pre-term cases according to duration in which neonatal deaths occurred.

Duration of NND within (in days)	Number	Percentage
≤2	10	27.78
03-8	14	38.89
9-14	12	33.33
Total	36	100

Table 10 shows distribution of babies of pre-term cases according to duration in which neonatal deaths occurred. Out of 36 deaths that occurred, majority i.e. 14 (38.89%) occurred within 3-8 days followed by 12 (33.33%) deaths within 9-14 days.

DISCUSSION

The present study was carried out in Obstetrics and Gynaecology department of our institute. We included 100 cases of mothers with preterm labor and 100 mothers with term labor as a comparison group. Out of 100 pre-term cases, 98 cases were vaginal deliveries and only 2 were lower segment cesarean section (LSCS).

Age incidence

In present study, majority of cases 65 (65%) were in age group of 21-30 years followed by 23 (23%) in age group of ≤20 years. Mean age was 24.81±4.49 ranging from 19 to 37 years. There was no significant association between maternal age and Feto-maternal outcome in present study.

In similar study by Dingens et al from USA, majority (29%) of mothers from preterm group were in age group of 20 -25 years. Lakshmi et al from Telangana observed majority of the women in both groups of preterm and term labor were between 20-29 years which is similar to present study. Philip et al from Kerala, India in their study on neonatal outcome of preterm births found no significant association of the maternal age to the neonatal outcome in preterm births in present study which is similar to present study. Following table shows mean age in different studies.³⁻⁵

Parity

In present study, majority 52 (52%) of study subjects were primigravida followed by 28 (28%) having parity 1. This was followed by 13 (13%) having parity 2. Only one case had parity 4. Out of 60 cases of bacterial vaginosis, maximum 36 (60%) cases were primigravida followed by 14 (23.33%) cases with parity 1. Derakhshi et al observed double or multiples pregnancies most common in their study, Palomer et al in their study observed 19.2% of

preterm newborns related to the multiple pregnancies, Mohsenzadeh et al in their study observed 19.7% of premature newborns were due to multiple pregnancies which is not consistent with our study.¹⁵⁻¹⁷

Socioeconomic status

In present study, majority 36 (36%) of mothers belonged to lower class followed by 28 (28%) cases in lower middle class. The mothers with lower socioeconomic status were more in BV positive category as compared to BV negative patients.

A study by Ali et al from Assam observed that socioeconomic status was found be lower in BV positive patients as compared to BV negative patients which is consistent with present study.¹⁸ Another study by Jain et al found that preterm labor was more common lower socioeconomic class (58%) which is higher than present study.¹⁹ Lata et al found more mothers in lower class with BV positive as compared to other socioeconomic classes and this is similar to present study.⁸

Birth weight

In present study, majority 57 (57%) babies were having weight <2 kgs followed by 32 (32%) babies having weight between 2-2.4 kgs. The combined low birth weight accounts for 90 (90%) babies. This is higher as compared to other similar studies as present study had most of deliveries between 32-35 weeks of gestation. Akhter et al in their study on perinatal outcome in preterm labor found 42% of low birth babies in preterm group which is lower than present study.² Laxmi et al found that LBW was present in 33.3% of the women in the study group (preterm mothers) and 3.33% in the control group (term mothers). This finding is lower than present study.⁴ Seth et al observed that 20% babies were LBW in preterm group of women which is lower than present study.²⁰

Henderson et al discussed that almost 57% of babies were LBW in mothers with gestational period of <37 weeks which is similar finding as present study but the percentage is lower than present study findings.²¹

Post-natal complications

Out of 100 cases, 66 (66%) cases had postnatal complications and 34 had no complications. Majority (30) mothers had lactation insufficiency followed by Puerperal sepsis in 24 mothers. 12 mothers had birth canal trauma cervix, vagina and perineum and 8 mothers had post-partum depression and psychosis. Also, out of 60 mothers with presence of bacterial vaginosis, maximum 45 (75%) mothers had post-natal complications. Merrikay et al in an economic model discussed that series of studies reviewed for the incidence and attributable risks of pregnancy complications related to BV included women from different ethnic and

socioeconomic groups reported an increased risk for preterm delivery or LBW among women with BV. This finding is consistent with present study.

Jiang et al observed that cases with scarred uterus, women who had cesarean section once or more or other previous uterine surgery, occurred in both control and preterm pregnancies, but were significantly increased in the latter which is consistent with present study. Women with placenta previa or abnormal S/D ratio were more likely to have preterm delivery.

NICU stay and admission

In present study, out of 100 babies, 72 (72%) babies who stayed in NICU, majority 11 (34.38%) stayed for 21-30 days followed by 9 (28.12%) babies for 1-10 days. Henderson et al in their study observed that women with gestational age of 32-36 weeks had 62.4% of babies admitted in NICU which is lower than present study.²¹

Laxmi et al in their comparative study on preterm and term labor found 43.33% babies from preterm group with NICU admission which is lower than present study. NICU stay more than 2 days was seen in 43.33% babies in preterm group which is higher than present study findings of 28.12%.⁴

Neonatal deaths

In present study, out of 36 (36%) total neonatal deaths. Maximum 10 (27.78%) babies died due to sepsis followed by 08 (22.22%) due to birth asphyxia. Respiratory distress was cause of death in seen in 07 (19.44%) neonates. Out of 36 total neonatal deaths, 21 had mothers with bacterial vaginosis. Out of these 21 mothers, majority 06 (28.57%) had neonates who died due to sepsis.

Akhter et al found 35% neonatal deaths in preterm labor group which similar to present study findings. Respiratory distress was most common cause of NICU admission and mortality which is similar to present study whereas Laxmi et al discussed 20% neonatal deaths in their study which is lower than present study.^{2,25}

Bangal et al found that neonatal mortality was 100% in the babies born with birth weight of 1000 grams. Neonatal mortality was directly proportional to birth weight of the baby. Neonatal mortality was 63.33% in babies born before 31 weeks of gestation. Overall early neonatal mortality was 27.27%. Sepsis, respiratory distress and birth asphyxia was most common cause of NICU admission and mortality which is similar to present study.²⁵

Singh et al found that septicemia and hypoxic ischemic encephalopathy were the two most common causes of neonatal morbidity and mortality after RDS, accounting for 16.8% and 9.2% respectively in less than 34 weeks

gestational age group.²² Hyperbilirubinemia developed in approximately 50% of preterm babies irrespective of gestational age which is higher than present study.

Limitations

Single center observational study with a small sample size.

CONCLUSION

The present study is an attempt to obtain data in pattern of early neonatal morbidity and mortality to compare it with term neonates. There is a particular need to educate health care providers and parents about the vulnerability of infants born between 28-36 weeks of gestation. From the present study and the literature, it is clear that preterm group is significantly more vulnerable when compared with the term group. This study will lead to review of care for preterm group and help optimize care for this cohort of infants.

Reorganization of services and increased resource allocation to provide better clinical support to this group may be needed in most settings. The findings of this study may also affect antenatal counselling regarding delivery in preterm gestation.

Understanding morbidity risk among preterm infants is not only important helping new-born care providers to anticipate and to manage potential morbidity during birth hospitalization and earlier follow up after hospital discharge, but also may possibly assist in guiding non-emergency obstetric intervention decisions.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. WHO | Care of the preterm and/or low-birth-weight newborn. WHO. 2014;
2. Akhter G, Rizvi SM, Hussain SI. Evaluation of perinatal outcome in preterm labour. *Sch Int J Obstet Gynec.* 2020;3(6):147-52.
3. Dingens AS, Fairfortune TS, Reed S, Mitchell C. Bacterial vaginosis and adverse outcomes among full-term infants: a cohort study. *BMC Pregnancy Childbirth.* 2016;16(1):1-8.
4. Laxmi U, Agrawal S, Raghunandan C, Randhawa VS, Saili A. Association of bacterial vaginosis with adverse fetomaternal outcome in women with spontaneous preterm labor: a prospective cohort study. *J Matern Neonatal Med.* 2012;25(1):64-7.
5. Philip T, Thomas P. A prospective study on neonatal outcome of preterm births and associated factors in a South Indian tertiary hospital setting. *Int J Reprod Contraception Obstet Gynecol.* 2018;7(12):4827.

6. Clark P, Kurtzer T, Duff P. Role of bacterial vaginosis in peripartum infections. *Infect Dis Obstet Gynecol.* 1994;2(4):179-83.
7. Joesoef MR, Hillier SL, Wiknjosastro G, Sumapouw H, Linnan M, Norojono W, et al. Intravaginal clindamycin treatment for bacterial vaginosis: Effects on preterm delivery and low birth weight. *Am J Obstet Gynecol.* 1995;173(5):1527-31.
8. Lata I, Pradeep Y, Sujata S, Jain A. Estimation of the incidence of bacterial vaginosis and other vaginal infections and its consequences on maternal/fetal outcome in pregnant women attending an antenatal clinic in a tertiary care hospital in North India. *Indian J Community Med.* 2010;35(2):285-9.
9. Dingens AS, Fairfortune TS, Reed S, Mitchell C. Bacterial vaginosis and adverse outcomes among full-term infants: A cohort study. *BMC Pregnancy Childbirth.* 2016;16(1):1-8.
10. Aderoba A, Olorok O, Olagbuji B, Ande A, Okonkwo C, Ojide C. Bacterial vaginosis in spontaneous preterm and term birth: a case-control study. *Trop J Obstet Gynaecol.* 2016;33(3):297.
11. Philip T, Thomas P. A prospective study on neonatal outcome of preterm births and associated factors in a South Indian tertiary hospital setting. *Int J Reprod Contraception Obstet Gynecol.* 2018;7(12):4827.
12. Jiang M, Mishu MM, Lu D, Yin X. A case control study of risk factors and neonatal outcomes of preterm birth. *Taiwan J Obstet Gynecol.* 2018;57(6):814-8.
13. Soltani M, Tabatabaee HR, Saeidinejat S, Eslahi M, Yaghoobi H, Mazloumi E, et al. Assessing the risk factors before pregnancy of preterm births in Iran: A population-based case-control study. *BMC Pregnancy Childbirth.* 2019;19(1):1-8.
14. Kanga YM, Ngunde JP, Akoachere JFKT. Prevalence of bacterial vaginosis and associated risk factors in pregnant women receiving antenatal care at the Kumba Health District (KHD), Cameroon. *BMC Pregnancy Childbirth.* 2019;19(1):1-8.
15. Derakhshi B, Esmailnasab N, Ghaderi E, Hem-Matpour S. Risk factor of preterm labor in the west of Iran: a case-control study. *Iran J Public Health.* 2014;43(4):499-506.
16. Palomar L, DeFranco EA, Lee KA, Allsworth JE, Muglia LJ. Paternal race is a risk factor for preterm birth. *Am J Obstet Gynecol.* 2007;197(2):152-7.
17. Mohsenzadeh A, Saket S, Karim A. Prevalence of preterm neonates and risk factors. *Iran J Neonatol.* 2011;2(2):38-42.
18. Ali J, Borah S, Barkataki D, Imsong N. Association of bacterial vaginosis with preterm labour. *Indian J Obygn.* 2015;2(2):93-7.
19. Jain DR. Role of bacterial vaginosis in preterm labor a prospective study. *Int J Med Res Rev.* 2016;4(4):543-9.
20. Seth R, Maheshwari M, Saini L, Sharma V. Effects of bacterial vaginosis on perinatal outcome. *J Evol Med Dent Sci.* 2014;3(8):2040-6.
21. Henderson J, Carson C, Redshaw M. Impact of preterm birth on maternal well-being and women's perceptions of their baby: a population-based survey. *BMJ Open.* 2016;6(10).
22. Uma S, Nisha S, Shikha S. A prospective analysis of etiology and outcome of preterm labor. *Obstet Gynecol.* 2007;57(1):48-52.
23. Ali J, Borah S, Barkataki D, Imsong N. Association of bacterial vaginosis with preterm labour. *Indian J Obygn.* 2015;2(2):93-7.
24. Subtil D, Denoit V, Gouëff FL, Husson MO, Trivier D, Puech F. The role of bacterial vaginosis in preterm labor and preterm birth: a case-control study. *Eur J Obstet Gynecol Reprod Biol.* 2002;101(1):41-6.
25. Bangal VB, Shinde KK, Khanvelkar GK, Patil NA. A study of risk factors and perinatal outcome in preterm labour at tertiary care hospital. *Int J Biomed Res.* 2012;3(3):87-9.

Cite this article as: Lewis PF, Kumari A, Bavdekar N. Maternal outcome in preterm labor in a tertiary care hospital. *Int J Reprod Contracept Obstet Gynecol* 2021;10:222-7.