



CLINICO-PATHOLOGICAL PROFILE AND MATERNAL-PERINATAL OUTCOME IN PRETERM LABOUR

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ABSTRACT

Introduction: Preterm birth is a major clinical concern in obstetrics and neonatology as it is associated with morbidity, mortality, and disability. The incidence rate of preterm deliveries reported by the United States of America is 11%, whereas it ranges from 10% to 69% in the Indian population, constituting 40% to 75% of neonatal deaths.

Aim: To assess the clinicopathologic profile of women with a high risk of preterm delivery and early outcome of neonates in a rural tertiary care hospital.

Materials And Methods: This prospective, clinicopathological study was conducted in N.S.C.B Medical College Jabalpur M.P (India). A total of 130 preterm neonates were enrolled and analyzed using a proforma designed to document desired neonatal and maternal characteristics. All the participants were interviewed and examined in a healthcare setup and data were statistically analyzed.

Results: A total of 36 intrauterine deaths were observed in preterm subject and their distribution showed 55.6% in 25-29 years; while the distribution of live birth were observed 43.6% in 20-24 years. All the observed intrauterine deaths were seen in low SES. Majority of live birth 94.7 from low SES. 97.9% of cases of live birth were also unbooked cases and all the cases were seen in the unbooked intrauterine deaths. The intrauterine deaths showed that 83.3% of cases had no history of abortion 11.1% of intrauterine deaths in history of 1 abortion. Only one of each intrauterine death in 2 and 3 abortion. In our study 97.2% of intrauterine deaths were seen between 28-32 weeks of gestational age. Majority 74.5% of live births were seen between 28-32 weeks of gestational age. 96.9% of cases were observed vaginal delivery. All the intrauterine deaths were seen in vaginal deliveries and majority 95.7% of live births were also seen in vaginal deliveries.

Conclusion: The survival of preterm neonates was better with advanced gestational age. Bad maternal obstetric history and poverty significantly influenced the incidence of preterm births. Provision of appropriate care during pregnancy and conduction of awareness programs on maternal health in rural areas may help reduce preterm birth.

KEYWORDS : Preterm, Neonates, Intrauterine, Morbidity and Mortality.

INTRODUCTION

Preterm labour is defined as when the labour starts before 27 completed weeks counting from the 1st day of the last menstrual period lower limit of gestational age for preterm labour is not uniformly defined. In developed countries it is 20 weeks and in developing countries it is 28 weeks.

Preterm labour is the major cause of perinatal morbidity and mortality constructing a severe worldwide health problem. Incidence of preterm labour ranges between 10-15% incidence of perinatal mortality rate in India varies from 40-150/1000 live births in contrast to 10-20/1000 live birth in the developed countries. Perinatal morbidity and mortality is mainly due to intrapartum hypoxia, neonatal respiratory distress syndrome, intraventricular haemorrhage and cerebral palsy.

In about 50% cases the cause of preterm labour is unknown but often it is multifactorial. These include chorioamnionitis, abnormal placentation, fetal and maternal stress and bleeding in the decidual chorionic interface. Other factors include young maternal age, low maternal weight, poor nutritional status, illiteracy, uncontrolled fertility, poor sanitation and hygiene, hard manual work, lack of prenatal care, broken homes, unmarried status and substance abuse. (Mercer et al, 1995)¹

Maternal morbidity and mortality due to preterm labour is rare. The most common maternal complication is postpartum endometritis. Mostly women with postpartum endometritis respond rapidly to intravenous antibiotics.

The perinatal outcome in cases of preterm labour is influenced by factors like maternal age, nutritional status of

women, weight before pregnancy and during pregnancy weight gain, antenatal care, financial accessibility to health services and quality of neonatal care.

To reduce the incidence of preterm labour, it is compulsory to take the detailed history of the patient, including previous obstetrical history, medical and surgical history. Chief complaints should be asked carefully which include history of amenorrhea, pain in abdomen, leaking per vaginum or white discharge, fever, urinary tract infection and dental infection.

Preterm labour can be diagnosed clinically by following-

- Regular uterine contractions.
- Cervical changes- dilation and effacement
- Intact membranes
- Gestational age >28 weeks but <37 weeks.

After clinical diagnosed of preterm labour, it is classified into early, advanced and threatened preterm labour. Tocolytics, steroids and antibiotics improve the maternal and perinatal outcome in preterm labour.

This study was carried out with the purpose to analyse the incidence, clinic-pathological and various factors contributing to the maternal and perinatal outcomes in cases of preterm labour, admitted in N.S.C.B. medical College, Jabalpur in the study from June 2011 to September 2012.

AIMS AND OBJECTIVES:

- To find out incidence of preterm labour in obstetrical patient attending obstetrics and gynaecology department N.S.C.B. Medical College, Jabalpur M.P.
- To elucidate possible causes of preterm labour.
- To evaluate course of pregnancy and labour in these

patients.

- To assess maternal and perinatal outcome in preterm labour patients.

MATERIAL AND METHODS:

Study Design: Prospective study

Study period: June 2011 to Sept. 2012

Inclusion Criteria: Obstetric patients with gestational age >28 weeks but <37 weeks admitted in Department of Obstetrics and Gynaecology, N.S.C.B. Medical College and Hospital, Jabalpur (M.P.) with complaint of pain in abdomen.

Exclusion Criteria:

- Obstetrics patients before 28 weeks or beyond 37 weeks.
- Obstetrics patients between 28 weeks and 37 weeks not fulfilling diagnostic criteria of preterm labour.

Methodology:

Present study was conducted on obstetric patients with gestational age >28 weeks but <37 weeks fulfilling criteria of preterm labour attending obstetrics and gynaecology department at N.S.C.B. Medical College and Hospital, Jabalpur (M.P.).

Obstetrical Examination:

- Fundal height
- Lie, presentation
- Position
- Contraction :
 - No. of contraction in 10 min.
 - Duration of contraction
- Liquor
- FHR

Internal Examination:

- P/S - Discharge
 - Amount
 - Colour
 - Odor
- P/V - Dilatation
 - Cervical length/Effacement
 - Membrane status
 - Assessment of pelvis
 - Station of head

On the basis of these observations the patient will be classified into advanced, early, threatened preterm labour and false labour.

Investigations:

- Complete hemogram
- RBS
- Urine- routine and microscopic
- HIV, VDRL, HBsAg
- PS for MP
- CRP

Specific Examinations:

- USG for gestational age, presentation, AFI, Placental localization, fetal weight and cervical length.
- Amniotic fluid analysis (sample obtained by amniocentesis with patients consent)- Gram stain, Leukocyte count, Glucose, LDH
- Vaginal swab- All these patients were observed during pregnancy and labour.

Management:

All obstetrical patients with gestational age >28 weeks but <37 weeks fulfilling diagnostic criteria for preterm labour admitted in Department of Obstetrics and Gynaecology N.S.C.B. Medical College and Hospital, Jabalpur (M.P.) were

investigated to evaluate causes of preterm labour and complications followed through pregnancy and labour; maternal and perinatal outcome were observed.

RESULTS :

The age wise distribution of the studied subjects. Majority (79.3%) of the studied subjects were seen in age range of 20-29 yrs. 20.7% of subjects belonged to 30-39 yrs. The mean age of subject was 25.70±3.58 yrs. 38.4% cases were illiterate or literate only upto primary school 50.8% cases were literate up to middle and only 10.8% cases were literate upto high school. Socioeconomic status findings showed that 96.2% of cases were belonging to lower class and 3.8% cases were in middle class none of the cases was form upper class.

Table 1- Clinical Characteristic Of Patients

Antenatal Care N=130	No. of Cases	Percentage
Booked	2	1.5
Unbooked	128	98.5
Gravida		
1	49	37.7
2	43	33.1
3	24	18.5
≥4	14	10.7
Parity		
0	55	42.3
1	42	32.3
2	20	15.4
3	9	6.9
≥4	4	3.1
No. of Abortion		
0	115	88.5
1	12	9.2
2	2	1.5
3	1	0.8
Type of preterm labour		
Threatened	1	0.8
Early	49	37.7
Advanced	71	54.6
Iatrogenic	9	6.9
Intervention		
Antibiotics	130	100.0
Steroids	71	54.6
Tocolytic	21	16.1
Augmentation of labour		
* Oxytocin	69	53.1
* ARM	35	26.9
* Cerviprime	19	14.6
Mode of Delivery		
Vaginal delivery	126	96.9
LSCS	4	3.1
Neonatal Outcome		
Live birth	94	72.3
Fresh IUD	20	15.4
Macerated IUD	16	12.3
NICU admission (n=94)		
Yes	37	39.4
No	57	60.6
Birth Weight		
<1 ELBW	7	5.4
1-1.5 VLBW	40	30.8
1.5-2.5 LBW	83	63.8
Neonatal Complications (n=94)		
Birth Asphyxia	8	8.5
Respiratory distress syndrome	6	6.4
Congenital Malformation	9	9.57
Pneumonia	1	1.1
Necrotizing enterocolitis	0	0.0
Sepsis	5	5.3

Jaundice	2	2.1
Neonatal Death	11	11.7

Majority of the cases 78.8% were gravida 1 and 2, 18.5% of cases were gravida 3 and 10.7% cases were belonging to gravida 4 or above. 74.6% of cases were nulliparous and primiparous 25.4% of cases were multiparous. Majority of cases were 88.5% had no history of abortion and 9.2% of cases had history of 1 abortion 1.5% of subjects had history of 2 abortions and 0.8% cases had history of 3 abortions. 54.6% of cases were advanced preterm labour and 37.7% of subjects were early preterm labour. Only 0.8% cases were threatened preterm labour and 6.9% of cases were iatrogenic. (Table-2)

Antibiotic were given to all cases. 54.6% of cases received steroid, Tocolytic therapy was cases for 16.1% of cases and the latency period was prolonged by 48 hours to 7 days in these cases. Patients were active labour or were augmentation was indicated 27.7% cases were intrauterine deaths. Augmentation was done in 53.1% of cases with oxytocin in 26.9% of cases with artificial rupture of membranes. Induction of labour with PGE2 gel instillation was done in 14.6% of cases who were medically indicated preterm labour. (Table-2)

Present study majority 72.3% of the babies born were live, 15.4% were fresh intrauterine deaths and 12.3% macerated intrauterine deaths. Among 27.7% of intrauterine deaths 25.0% were associated with congenital malformation, 30.6% intrauterine deaths were associated with antepartum hemorrhage, pregnancy induced hypertension and malpresentation and 44.6% of intrauterine deaths etiology was unknown. Among 72.3% of live births, 39.4% of newborn were admitted in NICU for further management of neonatal complications. 63.8% of the babies were low birth weight, 30.8% of babies were very low birth weight and 5.4% of babies were extremely low birth weight category. (Table-1)

Table 2- Impact Of Neonatal Outcome

Age	IUD	LB	Total
20-24	9 25.0%	41 43.6%	50 38.5%
25-29	20 55.6%	33 35.1%	53 40.8%
30-34	7 19.4%	18 19.1%	25 19.2%
35-39	0	2 2.1%	2 1.5%
SES			
Low	36 100.0%	89 94.7%	125 96.2%
Middle	0 0.0%	5 5.3%	5 3.8%
Antenatal care			
Booked	0 0.0%	2 2.1	2 1.5%
Unbooked	36 100.0%	92 97.9%	128 98.5%
Abortion			
0	30 83.3%	85 90.4%	115 88.5%
1	4 11.1%	8 8.5%	12 9.2%
2	1 2.8%	1 1.1%	2 1.5%
3	1 2.8%	0 0.0%	1 0.8%
Preterm Labour			
Advanced	18 50.0%	53 56.4%	71 54.6%
Early	15 41.7%	34 36.2%	49 37.7%

Threatened	0 0.0%	1 1.1%	1 0.8%
Iatrogenic	3 8.3%	6 6.4%	9 6.9%
Gestational Age			
28-32	35 97.2%	70 74.5%	105 80.8%
33-36	1 2.8%	24 25.5%	25 19.2%
Mode of delivery			
LSCS	0 0.0%	4 4.3%	4 3.1%
Vaginal delivery	36 100%	90 95.7%	126 96.9%
Birth Weight			
<1	5	2	7
ELBW	13.8%	2.1%	5.38%
1-1.5	15	25	40
VLBS	41.7%	26.6%	30.76%
1.5-2.5	16	67	83
LBW	44.5%	71.3%	63.84%

A total of 36 intrauterine deaths were observed in preterm subject and their distribution showed 25% subjects in the age group of 20-24 years; 55.6% in 25-29 years; 19.4% in 30-34 years of age group while the distribution of live birth were observed 43.6% in 20-24 years 35.1% in 25-29 years; 19.1% in 30-34 years and 2.1% in 35-39 years. All the observed intrauterine deaths were seen in low SES. Majority of live birth 94.7 from low SES. Only 2.1% of live birth were seen in booked cases. 97.9% of cases of live birth were also unbooked cases and all the cases were seen in the unbooked intrauterine deaths. The intrauterine deaths showed that 83.3% of cases had no history of abortion 11.1% of intrauterine deaths in history of 1 abortion. Only one of each intrauterine death in 2 and 3 abortion. (Table-3) A total of 27.7% intrauterine deaths were observed in present study and the distribution of intrauterine deaths showed 50% cases were advanced preterm labour, 41.7% were early preterm labour, 8.3% were iatrogenic cases. The distribution of live birth showed 56.4% were advanced preterm labour, 36.2% were early preterm labour 6.4% were iatrogenic cases and 1.1% were threatened preterm labour. In our study 97.2% of intrauterine deaths were seen between 28-32 weeks of gestational age and only 2.6% of intrauterine deaths were seen between 33-36 weeks of gestational age. Majority 74.5% of live births were seen between 28-32 weeks of gestational age and 25.5% of live births were seen between 33-36 weeks of gestational age. (Table-3) 96.9% of cases were observed vaginally and only 3.1% of cases were delivered by LSCS. All the intrauterine deaths were seen in vaginal deliveries and majority 95.7% of live births were also seen in vaginal deliveries. Among the cases with intrauterine deaths, 13.8% babies were presently low birth weight 41.7% babies were very low birth weight and 44.5% babies were low birth weight category. The birth weight distribution live births were seen as 2.1% babies were extremely low birth weight 26.6% babies were very low birth weight and 71.3% babies were low birth weight category. (Table-2)

DISCUSSION:

The present study majority of cases occurred in the age group between 20-29 yrs (79.3%). **Marcel et al¹ (1996)** reported that young maternal age was associated with increased risk of preterm labour. Low socioeconomic status and low literacy level was associate with increased risk of preterm labour.

Vintzileos et al (2002)² Adequate antenatal care has been associated with reduction in the risk of preterm delivery and low birth weight. Several studies have documented that enhanced antenatal care that neonates patients education,

behavioral intervention or psychosocial report has resulted in reduction in low birth weight. (Kogan et al, 1994)³.

In present history or preterm delivery in first pregnancy was found in 6.1% of cases. Car-Hill et al (1985)⁴ demonstrated that risk of preterm delivery is 15.0% when first pregnancy was preterm. Risk increases to 24% if first delivery at term but the second was preterm. Risk increases to 34% if both first and second pregnancies were preterm delivery.⁴ In the present study majority 70.8% of cases were gravida 1 and 2. In present study 88.5% of cases had no history of abortion 9.2% cases had history of one abortion and 2.3% of cases had history of two or three abortions.

Lumley et al (1998)⁵ found an incidence of preterm birth in primiparous women of 5.9%. This incidence increased with the number of prior spontaneous or induced abortions.

Gestational age at the time of admission: In present study majority 80.8% of cases were seen between 28-32 weeks of gestational age and only 19.2% of cases were between 33-36 weeks of gestational age. In present study it was observed that as the gestational age increased, perinatal mortality rate decreased. After achieving a gestational age of 28 weeks (for females) to 30 weeks (for male) survival rates reach the Fanaroff et al (2007).⁶

In present study C-reactive protein in maternal serum was negative of all the studied cases. CRp value ≥ 0.8 mg/dl have high sensitivity and positive predictive value for the diagnosis of infections. (Dodds and Lams, 1987)⁷

Women in preterm labour with normal CRP levels do not require amniocentesis for the purpose of ruling out intra amniotic infection. (Mazor and Colleagues, 1993)⁸

In present study 10% of cases had pus cells >5 cells/HPF and epithelial cells >7 cells /HPF in their urine microscopic examination. Desai et al (2001)⁹ from Belgaum reported that incidence of preterm labour and premature rupture of membrane was higher in women with genitourinary tract infection.

Kaas et al (1970)¹⁰ suggested that asymptomatic patients with 2 or more urine cultures having >100000 colonies of pathogenic bacteria per milliliter of urine have 2 to 3 times more risk of preterm labour.

Interventions in preterm labour cases:

All the patient study received antibiotics. Antibiotics prolonged the latency period in preterm labour and antibiotics treated women had significantly fewer newborns with respiratory distress syndrome. (Mercer et al 1997)¹¹

In present study 54.6% of cases were given steroids. Single course of antenatal corticosteroid is recommended in preterm labour. (American College of Obstetrics and Gynaecologist 2007).¹²

In present study tocolytics were given in 16.2% of cases. Sirohiwal et al (2001)¹³ from Rohtak in Haryana reported an incidence of preterm labour of 9.3% of these 10.3% were selected for tocolytic therapy. A comparison of the efficacy of isoxsuprine and ritodrine revealed that pregnancy period achieved in the isoxsuprine group was 16.6 days and the pregnancy period in the ritodrine group was 23.6 days.¹³

When Patients were in active labour or were augmentation was indicated (27.7% cases were intrauterine deaths), augmentation of labour was done with oxytocin in majority (53.1%) of cases, 26.9% of cases were augmented with artificial rupture of membrane and 19.2% of cases were with

PGE₂ instillation in cases of medically indicated preterm labour.

In our study majority (96.9%) of cases delivered vaginally and LSCS was done in 3.1% of cases for fetal indication. World Health Organization was conducted the global survey on maternal and perinatal health in 2005 in Latin America. They obtained data for 97095 of 106546 deliveries, they reported that the median rate of caesarean delivery was 33%, with the highest rates of caesarean delivery noted in private hospitals (51.0%). Increase in the rate of caesarean delivery was associated with increase in the maternal as well as neonatal morbidity and mortality rates.¹⁴

Maternal morbidity in Puerperium: In present study majority (40.8%) of cases had severe anemia. Bhatt (2002)¹⁵ from Baroda reported a higher incidence of low birth weight babies (Preterm and IUGR) in women with severe anemia. Awasthi et al (2001)¹⁶ from Indore reported an incidence of preterm labour in 53.2% of anemic mothers as compared to 4% in non anemic condition.

Neonatal complications: In present study birth asphyxia developed in 8.5% babies respiratory distress syndrome developed in 6.4% babies. Maternal fetal Medicine Units Network designed a trial to study expectant management combined with a 7 days treatment of ampicillin, amoxicillin plus azithromycin or placebo. Antimicrobial treated women had significantly fewer newborn with respiratory distress syndrome. (Mercer et al, 1997)¹

In present study neonatal sepsis developed in 5.3% babies and neonatal death occurred in 11.7% babies. More recent studies have examined three day treatment compared with 7 days regimens using either ampicillin - sulbactam appeared equally effective in perinatal outcomes. (Lewis et al, 2003)¹⁷

Perinatal Morbidity And Mortality In Preterm Labour Cases:

In present study 72.3% cases were lives births, out of which 11.1% were neonatal deaths and 27.7% were intrauterine deaths accounting for perinatal mortality. Among 27.7% of intrauterine deaths, 25% intrauterine deaths were associated with congenital malformations; 30.6% intrauterine deaths were associated with antepartum haemorrhage pregnancy induced hypertension and malpresentation and etiology was known in 44.6% of intrauterine deaths.

Dr. Lubchenco conducted study on very low birth weight preterm infants (1947-1950) in Colorado, and reported a handicap rate of 68%.¹⁸

Dr. Hess (1950) conducted study on very low birth preterm infants in Chicago and observed 92.0% of survivors of these infants and reported 41.0% incidence of handicap.¹⁹

According to the Swedish Birth Registry neonatal survival rates for infants born at 25 weeks, the survival rate increases form 54.0% in the 1st time period (1989-1991) to 80.0% in the 2nd time period (1991-2001)²⁰

CONCLUSION:

Educating and building awareness regarding the adverse outcomes of teenage pregnancies can go a long way in reducing preterm delivery and neonatal mortality. Besides, improving facilities for antenatal care and emergency obstetric and neonatal care can help reduce adverse maternal and neonatal outcomes. The Pradhan Mantri Matritva Vandana Yojana (PMMVY), maternal and child health (MCH) services, and integrated child development (ICDS) services must reach every remote locality of India and be utilized efficiently by the beneficiaries, to help achieve optimum maternal and neonatal outcomes.

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