DOI: 10.5281/zenodo.10570300

15

STUDY OF FETOMATERNAL OUTCOME IN CASES OF PRETERM LABOUR

DR. DIPIKA PRAJAPATI: -2nd Year Resident Doctor, Department of Obstetrics and Gynaecology, Smt SCL Municipal General Hospital, Smt NHLMMC.

DR. NIRALI PANCHAL: - 2nd Year Resident Doctor, Department of Obstetrics and Gynaecology, Smt SCL Municipal General Hospital, Smt NHLMMC.

DR. SHLOK V. PATEL: - MBBS (Bachelor of medicine and bachelor of surgery), Smt NHL MMC.

DR. RINA V. PATEL: - Professor and Head of the Unit, Department of Obstetrics and Gynaecology, Smt SCL Municipal General Hospital, Smt NHLMMC.

DR. NIKHARBHAI VAGELA: -1st Year Resident Doctor, Department of Obstetrics and Gynaecology, SVP HOSPITAL,
Smt NHLMMC.

DR. VAISHALI P. PANCHAL: - Associate Professor, Department of Obstetrics and Gynaecology, Smt SCL Municipal General Hospital, Smt NHLMMC Ahmedabad pin 380008.

Abstract

INTRODUCTION

Preterm delivery and labour remain a major cause of perinatal morbidity and mortality.it affects not only the immediate neonatal period but also affect infancy, childhood and even Adulthood. preterm delivery accounts for one million deaths of neonates. preterm birth can result in long term complication in survivors with the frequency and severity of adverse outcome increasing with decrease gestational age

MATERIAL & METHODS

A retrospective study was conducted in obstetrics and Gynecology department in tertiary care hospital from 1st may – 31:st octomber The prevalence of preterm labour, risk factors, maternal characteristic &neonatal outcome studied

RESULT

The prevalence rate of preterm labour Is 18.6%.out of total 50neonates of preterm birth ,4 neonates delivered between28- 32 week of gestation age require NICU Admission due to low birth weight &associated neonatal complication, while out of 18 neonates of gestational age between 32 to 34 week ,14(83%) require NICU admission, out of 38 neonates of Gestational age between 34-37week only 17(60.17%) require NICU admission

CONCLUSION

Prevention, timely detection and expert management of common cause of preterm labour will help achieve better maternal and neonatal outcome

Study shows 50-60% cause of preterm labour are preventable if detected and treated early, this help in gaining few days to few weeks of intrauterine life for fetus in which it is not

only precious but also lifesaving this help in transferring the patient to tertiary center and giving steroid for lung maturity. correction of risk factors, institutional deliveries &good neonatal care outcome

Key words: FETOMATERNAL OUTCOME, PRETERM LABOUR

INTRODUCTION

The World health organization (WHO) defines preterm labour as any babies born alive before 37 weeks of gestation completed or 259 days of gestation since the first day of last menstrual period'.there are sub-categories of preterm birth, based on gestational age:

- **Extremely preterm (less than 28 weeks)**
- **Very preterm (28 to 32 weeks)**
- **Moderate to late preterm (32-37 weeks)**

Every year, an estimated 15 million babies are born preterm globally. Incidence rate of preterm birth ranges from 5-18 % globally. According to the national health portal, in India out of 27 million babies born every year,
3.5 million babies born are premature2.

Neonates born before 37 weeks are at risk of morbidity and mortality. Preterm babies are at risk of lifelong disability, cognitive impairment and poor quality of life. Complications of prematurity (45%) are the single largest cause of neonatal death and the second leading cause of death under the age of 5 years3.

Preterm labour and birth are of multifactorial origin like prior preterm birth and abortion, cervical insufficiency, recurrent pregnancy loss, multiple pregnancy, genital & urinary tract infection, immunological pathway and lifestyle*.

Routine screening and diagnosis of preterm labour can be done by clinical assessment, uterine activity monitoring, cervical length measurement, biochemical markers (maternal serum alpha-fetoprotein and fibronectin), sonography and nienviolgical assessment of cervicovaginal infections.

There is no definitive treatment for preterm labour. Interventions are done to reduce the known risk factors of preterm labour. Nutritious diet and medications like progesterone, tocolytics and steroids are given as per requirement. In cases of cervical insufficiency, cervical cerclage is done as a part of prevention of preterm labour.

ETIOLOGY OF PRETERM LABOUR

- it is classified into two broad subtypes

(1) Spontaneous preterm birth
(2) Induced/iatrogenic preterm birth

A. SOCIO-ECONOMIC AND DEMOGRAPHIC RISK FACTORS

Risk is high in low socioeconomic status, More Risk in women with extremes of age that is less than 18 and more than 35, Risk is high when height is less than 140cm.

B. PSYCHOSOCIAL FACTORS25

Anxiety, Stress, depression, long working hours >6 hours/day

C. PAST OBSTETRIC HISTORY

The recurrence risk ranges from 17-40% depending upon the number of previous preterm deliveries, History of preterm birth in Cervical incompetence patient, History of one or two first trimester abortions.

D. OBSTETRIC RISK FACTORS

Hypertensive disorders of pregnancy carry 12-34% risk of preterm labour, PPROM-25.9 % risk of preterm labour, Multiple pregnancy - 4.1 % risk of preterm labour.

E. ASSOCIATED MEDICAL CONDITIONS

Thyroid disease - Hypothyroidism contributes to 19.1% risk of preterm labour, thyrotoxicosis, Chronic hypertension, essential hypertension, pheochromocytoma, systemic lupus erythematosus

F. INFECTION

Bacterial infection: Intrauterine infections caused by bacteria are the leading cause of infection-associated preterm labour. 40 % of preterm labours are associated with intrauterine infections26, Chlamydia trachomatis: This is the most common sexually transmitted infection worldwide. Starting as cervicitis, chlamydial infection may ascend and infect the placenta or amniotic fluid, which may subsequently lead to preterm delivery.

Intrauterine or extrauterine infections produce inflammatory reactions in the form of Toll-like receptors (TLRs). TLRs initiate immune response, inducing proinflammatory factors involving cytokines, chemokines, prostaglandins and other effector molecules that result in complications of labour, e.g. rupture of fetal membranes.

G. GENETIC FACTORS

- Congenital anomalies of the uterus
- Cervical incompetence
- Family history of preterm labour

PATHOPHYSIOLOGY FOR ONSET OF LABOUR4

1. PROGESTERONE WITHDRAWAL THEORY
2. OXYTOCIN STIMULATION THEORY
3. FETAL CORTISOL THEORY
4. PROSTAGLANDIN THEORY
5. UTERINE OVERDISTENSION

Prediction of preterm birth

(I) Maternal characteristics

a. H/o Preterm birth 2-4 %
b. Premature contraction 3-5 %
c. Multiple pregnancy 2-4 %
d. Cervical insufficiency 1-2 %
e. Cervical shortening 1-2 %
f. Maternal infection
- Bacterial vaginosis is considered as a predictor of preterm birth. Risk of PTL was found increased when vaginal pH was >528
g. Maternal Vit D Deficiency -Risk of PTL is high in pregnant women with Vit D concentration <20 mg/ml32.

(II) Ultrasound Markers

a) Cervical length
- screening of cervical length by TVS is a good predictor of PTL risk in singleton pregnancies.

(III) BIOCHEMICAL MARKERS

a) Cervical Fluid

Fetal fibronectin is a glycoprotein which is produced by amniocytes and cytotrophoblasts

that binds chorionic membranes to maternal decidua. It is normally found in cervicovaginal fluids before 22 weeks of gestation but its presence in cervicovaginal fluid between 24 and 34 weeks of gestation indicates a risk of preterm birth.

b) Cervical Fluid
c) IL-6 and IL-8
d) PMAG-I (placental alpha mircoglobulian - 1)
e) Insulin like grow factor binding protein-1(IGFB-1)

(IV) VITAMIN B12 DEFICIENCY

PREVENTION OF PRETERM LABOUR

1. Progesterone
   17 hydroxyprogesterone caproate - is a synthatic progesterone
   Dose-250 mg imweekly from 16 week upto continue up to 36 weeks. it inhibits myometrium prostaglandin production thus contraction, prevents cervical ripening
2. Cervical cerclage
   Cervical cerclage is the surgical placement of suture or tape around the cervix in an attempt to prevent dialatation and subsequent preterm birth. ACOG recommends cerclage in singleton pregnancy with prior SPTB<34 weeks and CL
   < 25 mm and gestational age<24 weeks.
3. Tocolytics
   ACOG do not recommend tocolytic before 24 weeks' gestation., its advantage is it delay delivery by at least 48 hours for antenanal corticorsteroids to act and to achieve maximum fetal / neonatal benefit.

1) Calcium Channel Blockers
   It acts by preventing calcium entry through cell membrane channel. Nifedipine is the drug of choice for tocolytic, ACOG recommend a 30mg loading dose followed by 10-20 mg every 4-6hrs

2) Beta adrenergic receptor agonists:
   eg. Ritodrin , Terbutalin, Isoxuprine
   Isoxuprine can be used when nifedipine is ineffective.

3) Oxytocin receptor antagonist(Atosiban)
   Dose: initial bolus dose of 6.7mg over 1 minute. Followd by an infusion of 18mg/1hr for 3 hrs and then 6mg/hr for upti 45 hrs.

4) Magnesium sulhphet
   ACOG suggest MgSO4 use up to 48 hrs in patients between 24-34 weeks of gestation with PTL, Dosa is 4gm IV over 20 mins followed by a continuous infusion of 1 gm/hr.

AIMS AND OBJECTIVES

- To study etiological and multiple risk factors which are responsible for preterm labour
- To study the obstetric complications associated with preterm labour
- To study management for preterm labour
- To study feto-maternal outcome in preterm labour in form of morbidity and mortality

MATERIALS AND METHODS

INCLUSION CRITERIA:

- Pregnant woman admitted with signs and symptoms of preterm labour before 37 weeks of

pregnancy
- Patients who presented with leaking per vaginum (PROM)
- Iatrogenic preterm deliveries

EXCLUSION CRITERIA:
- Pregnancy before 24 weeks
- Pregnancy beyond and equal to 37 completed weeks
- Intrauterine fetal death
- Fetal congenital anomalies

METHOD OF DATA COLLECTION:
- Detailed history taking
- General physical examination
- Systemic examination
- Obstetrical examination
- Baseline and special investigation

This is the study between may- octomber 2023 in tertiary care institute in patient with preterm labour

OBSERVATION AND DISCUSSION

TABLE 1. AGE WISE INCIDENCE

Age group	No of patients	Percentage
<20	2	6.6%
20-25	10	33.33%
25-30	14	46.66%
30-35	3	10%
>35	1	3.3%

Majority of patient who delivered preterm were in the age group of 20-30 years.
Explanation for this is higher number of pateints belonging to this age group registered for ANC and this is the most common reproductive age group.

TABLE 2. SOCIOECONOMICAL CLASS

Social class	No of patients	Percentage
Lower class	20	66.66%
Lower medium	7	23.23%
Lower upper	3	10%

The rate of preterm labour is high in lower social economical class. Greater number of patients registered, belongtatued to lower socio economic class with poor nutritional status and poor compliance to regular ANC visits.

TABLE 3. TYPE OF PRETERM

Social class	Total		Survival			
			Live		Expired	
	No.	%	No.	%	No.	%
Extreme preterm<28 weeks	4	13.33%	0	0.0%	4	100%
Very preterm<28-31.6 weeks	10	33.33%	8	80%	2	20%
Late preterm<32-37 weeks	16	53.33%	15	13.75%	1	6.25%
Total	30	100%	23	93.75	7	7.25%

The total number of preterm babies with good neonatal outcomes were belonging to late preterm babies age group 32-37 weeks with survival rate of babies.
Amongst very preterm babies, those falling within gestational age of 28-31.6 weeks, babies survived which was very poor as compared to

late preterm babies.
One neonate survived in the gestational age group below 28 weeks in this study.
Manuck TA et al study shows that with each additional week for gestation conferring survival benefit while reducing the length of initial hospitalization

TABLE 4. MEDICAL AND SURGICAL MANAGEMENT

Management	No of patients	Percentage
Progesterone only	6	20%
Tocolytic only	6	20%
Progesterone + Tocolytic	12	40%
Cervical cerclage	4	13.33%

In the present study, medical management in the form of progesterone, tocolytics and combination was given to 6(20%),6(20%) and 12(40%) patients respectively. Some patients get both medical and surgical management together.
Progesterone inhibits prostaglandins in myometrium thus inhibiting contraction and helpful in prolonging pregnancy.
ACOG (2016C) approves the use of progesterone in singleton pregnancy with prior history of PTB and short cervix 54.
Tocolytics decrease the strength and frequency of uterine contractions in patients of early or acute preterm labour. Wilson A. et al demonstrated relative effectiveness and safety profiles for different classes of tocolytic drugs for delaying preterm birth.

TABLE 5. NEONATAL COMPLICATIONS

Neonatal complications	No of babies	Percentage
Respiratory distress syndrome(RDS)	11	40%
Septicaemia	5	20%
Intraventricular haemorrhage	5	20%
Neonatal juandice	3	16%

Necrostising enterrocolitis (NEC)	1	4%
Total	25	

Preterm births are more prone to perinatal morbidity and life threatening complications. In the present study total 25 no of babies were admitted in NICU among them the most common complication seen in preterm babies was RDS in 11(40%) followed by septicaemia 5(20%) which can leadto long term morbidity and mortality.
Ward RM et al also show similar neonatal complications like RDS, necrotising enterocolitis, neonatal jaundice and intraventricular haemorrhage.

TABLE 6. MATERNAL OUTCOME

Mode of delivery(MOD)	**No of patients**	**Percentage**
Induction of labour (A)	4	13.3%
Spontaneous delivery(B)	16	53.3%
AVBD(C)	2	6.6%
Vaginal birth(A+B+C)	22	73.3%
LSCS	8	26.6%

Majority of patients in this study delivered vaginally 22(73.3%) and operative intervention in the form of LSCS was done in 8(26%) no of patients. These operative deliveries were done for other obstetrics indication along with prematurity. Total 16(53.3%) no of patients were delivered spontaneously and while induction of labour was done in 4(13.3%) patients who were delivered vaginally.
Kawagoe et al shows vaginal delivery and/or induction of labour should be considered when early preterm birth is indicated as far as the fetus is reassuring. However, in cases of breech presentation and/or multifetal pregnancy, cesarean delivery might be considered if they are viable at a more advanced gestational age.

CONCLUSION

Preterm labour and birth remain a major cause of perinatal mortality & morbidity in developing countries like India. In the majority of cases no definitive underlying cause can be found, therefore prevention and management of preterm labour & birth is a great challenge to both obstetricians and neonatologists.

Preterm labour is a condition with multifactorial etiology, which includes obstetric complications, vaginal infections, lower socioeconomic class, past bad obstetric history, Multifetal gestation, greater use of ART and poor nutritional status.

Proper diagnosis and early detection of preterm labour can be done by regular ANC visits. Antenatal check-up helpful in timely diagnosis of vaginal infections,anemia, high blood pressure, short cervical length and other risk factors for preterm labour.

Primary preventive measures for preterm labour such as counselling on healthy diet, hygiene, optimal nutrition, family planning methods can be taken. Patients are counselled for stopping tobacco and betel nut chewing.

Higher degree of vigilance is required in Identification of pregnant women who are at risk of preterm delivery. Use of antibiotics, antenatal steroids, tocolytic treatments and cervical cerclage helps in reduction of systemic infections, decrease need for respiratory support, low rate of NICU admissions and reduce the cost of care in preterm babies.

A strong collaboration between obstetrician, neonatologist, patients and government

is needed to reduce the morbidity and mortality as a result of preterm birth. More research and trials are needed in order to find preventive measures ancidefinitive treatment in the form of medical and surgical interventions or other norinvasive measures to further decrease the rate of premature births.

REFERENCE

1. WHO, Preterm birth 2018,http://www.who.int/news-room/fact- sheet/detail/Preterm-birth.
2. National health portal, India, Preterm birth/National Health Portal Of India (nhp.gov.in)
3. Liu L, Oza S, Hogan D, Chu Y, Perin J, Zhu Jet al. Global,regional, and national causes of under 5 mortality in 2000-2015: an updated systemic analysis with implications for the Sustainable Development Goals. Lancet. 2016;388(10063):3027-35.
4. Hirala K, DC Dutta's Text book of Obstetrics. 9th edition. Jaypeebrothers medical publications; 2018.Pg. No.294 - 306
5. Foster C, Shennan AH. Fetal fibronectin as a biomarker of preterm labour: a review of the literature and advances in its clinical use. Biomark Med. 2014;8(4):471-84. doi: 10.2217/bmm.14.28. PMID: 24796611.
6. Katz M, Gill PJ, Newman RB et al. Detection of preterm labour by ambulatory monitoring of uterine activity: a preliminary report. Obstet Gynecol. 1986 Dec;68(6):773-8.
7. Lockwood Cj, Senyei Ae, Dische MR, et al: Fetal fibronectin in cervical and vaginal secretions as a predictor of preterm delivery. N Engl JMed325:669,1991

Conflict of Interest:

Nil

Acknowledgement:

Nil

Funding:

Nil