

A Prospective study of etiology and outcome of Preterm Labour in a Rural Medical College

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Abstract

Introduction: Preterm birth is a major problem in developing countries contributing significantly to perinatal mortality. Preventing preterm labor is still a great challenge in modern obstetrics. Every year an estimated 15 million babies are born too early (more than 1 in 10 babies are preterm). 1 million neonates dies each year due to complication of preterm birth. Many who survive face a life time of disability. **Aim & Objective:** To study the etiological factors and to assess the Neonatal Mortality and Morbidity associated with preterm labor and delivery. **Methods:** This prospective study was conducted from December 2014 to September 2015 in rural medical college where 107 antenatal women admitted with threatened preterm labor with or without rupture of membranes were followed till delivery and discharge. Gestational age at onset of preterm labor, associated risk factors, response to Tocolytics, Gestational age at delivery, and neonatal outcome were recorded and analysed. **Results:** Pregnancy Induced Hypertension, Anaemia, Infections, Oligohydramnios, were the commonest causes of preterm deliveries. Neonatal morbidity and mortality was less in steroid covered group. Birth asphyxia, Respiratory Distress Syndrome, Hyaline Membrane Disease were the commonest causes of morbidity. Respiratory Distress Syndrome was significantly reduced in those who were on steroid cover. **Conclusion:** There is a high incidence of preterm labor and preterm births in our set up. Infection and anaemia are important factors which can be prevented. Prolongation of delivery for 48 hrs by giving Tocolysis for getting the benefit of betamethasone coverage reduces morbidity due to RDS.

Key Words: Preterm Labor, Preterm Delivery, Uterine Tocolysis, Preterm Neonate.

Introduction

Preterm birth is a major problem in developing countries contributing significantly to perinatal mortality [1]. Preventing preterm labor is still a great challenge in modern obstetrics. Every year an estimated 15 million babies are born too early (more than 1 in 10 babies are preterm). Approximately 1 million neonates dies each year due to complication of preterm birth. Many who survive face a life time of disability [2].

Nearly half of the preterm births are preceded by pre term labor. The etiology of preterm delivery is unclear but is likely to be complex and influenced by genetics and environmental factors. Women with previous preterm birth are at increased risk of subsequent preterm birth delivery [1]. We need to be aware that Pre Term Labor (PTL) is not a disease, but an event which may result from single or multiple independent or interdependent

pathways [1] Preterm labor is often the final step in the multi-factorial process [3].

Preterm labor can be either iatrogenic or spontaneous, iatrogenic is the one which is induced by the obstetrician to terminate the labor with specific indications, where as spontaneous is the one which occurs in spite of best efforts to prolong the pregnancy, 80% of all the preterm labor fall in this category [4]. As preterm labor causes considerable morbidity and mortality in terms of neonates and mother and no single factor is solely responsible for pre term labor and delivery. This study was aimed at identifying the common factors responsible for pre term labor delivery and its outcome after possible intervention

Aims and objectives

1. To study the etiological factors of preterm labour and delivery.
2. To study the neonatal mortality and morbidity associated with preterm delivery.

Manuscript received: 4th December 2016

Reviewed: 12th December 2016

Author Corrected: 22nd December 2016

Accepted for Publication: 31st December 2016

Original Research Article**Materials and Methods****Study design:** Prospective Observational Study**Place of study:** Department of Obstetrics and Gynecology
Kamineni Institute of Medical Sciences, Narketpally.**Period of study:** Dec 2014 to May 2015**Sample size:** 107**Inclusion criteria:**

- All the patients admitted with preterm labor pains.
- All patients who were admitted and induced labor in preterm period.

Exclusion criteria:

- Patients of gestational age <28 wks.
- Patients of gestational age 37 wks and above.

Methodology: This was a prospective study conducted in the Department of Obstetrics and Gynecology of a rural medical college from December 2014 to September 2015. 107 cases of preterm delivery were studied. All patients

enrolled in the study were admitted and cause for preterm labor analyzed. Tocolytics were given in cases where immediate delivery was not indicated. Cases under conservative management were treated with appropriate antibiotics, fluid therapy. In cases with mild to moderate oligohydramnios amino acid infusion and fructodex was given. Betamethasone 2 doses of 12mg were given 24 hrs apart. Single dose of Betamethasone was given where immediate delivery was indicated. In those cases where termination of pregnancy was indicated, induction of labour was done and cases were managed by either vaginal delivery or emergency LSCS depending on the indication.

Immediately after delivery all the babies were attended by the pediatrician, APGAR score at 1 minute and 5 minute was noted, weight and sex of the baby recorded, depending on the condition, neonates were shifted to NICU and managed accordingly. Normal healthy neonates were shifted on to mother's side.

Results

In our study we observed that out of 107 cases, In 45(42.05%) cases conservative management was planned where antibiotics and tocolytics were given. In 29 cases pregnancy was prolonged for 2 days and until then betamethasone doses were given. In 6 cases pregnancy could be prolonged for a week, in 4 cases pregnancy could be prolonged for 2 weeks, in 6(5.6%) cases pregnancy could be prolonged to the expected date of delivery (EDD). Delivery on the day of admission was observed in 62 cases (57.94%), out of which 10(10%) cases had preterm Intra Uterine Death (IUD) where termination was indicated, 4(3.73%) cases had spontaneous preterm still birth. Rest 48 cases had live births where only a single dose of steroid could be given.

Analysis of etiological factors revealed it to be multifactorial they were either acting singly are in conjunction with other factors. eg. anaemia with PIH, Oligohydramnios or anaemia with infection.

Other Underlying risk factors like low socio economic status (SES), Smoking, unhealthy lifestyle, maternal age, were indirectly associated with anemia and PIH. Fetal outcome was studied in all cases admitted with preterm births, out of the 107 cases admitted with preterm gestation, 10 cases had IUD, 4 cases had still birth due to severe preeclampsia. Out of 93 (85.7%) live births. 14 (8.5%) healthy babies were shifted to the mother side. 79 babies required NICU admission, out of which 14 babies were put on Ventilatory support and rest 65 babies were kept under observation.

Out of 79 babies in NICU 70 babies recovered and were discharged, 9 babies died during neonatal period. Cause of death in the neonatal period was Respiratory Distress Syndrome (RDS) in 4 babies, Hyaline membrane disease (HDM) in 2 babies and Sepsis in 3 babies.

Table-1: Pregnancy Duration.

No. Of days pregnancy prolonged	Number of cases N (107)	Percentage
Two days	19	17.75%
1 week	16	14.95%
2 week	4	3.73%
Upto Term	6	5.6%
Delivery on the day of admission	62	57.94%
Total	107	100%

Table-2: Risk Factors for Preterm Labor.

Etiological factor	No of cases N=107	Percentage
PIH	44	41.12%
Anemia	38	35.55%
Oligohydramnios	33	30.84%
Vaginitis	29	27.10%
UTI	14	13.08%
Abruption of Placenta	9	8.41%
PROM	8	7.47%
2 Previous LSCS	9	8.41%
Placenta Previa	3	2.8%
HELLP Syndrome	2	1.86%
Twins	2	1.86%
Polyhydramnios	1	0.9%
1 Previous LSCS	1	0.9%

Table-3: Multifactorial Etiology

Factors	No. of cases
PIH + Anaemia+ oligohydramnios	19
PIH + Anaemia	27
Anemia + UTI + Vaginitis	22
UTI + Vaginitis	26
Vaginitis + PROM	5
PIH + Abrupton	8
Previous LSCS + Anaemia	32
Twins + PIH	2

Table-4: Fetal Morbidity and Mortality

	N=93	N=79				
NICU admission	79	Recovered		70		
		Neonatal Death		9	Rds	4
					HMD	2
					SEPSIS	3
					TOTAL	9
Total		79				
Babies shifted to mother side	14					
Total Live Births	93	Still Birth 4	IUD 10	Total (93+4+10)	107	

Table-5: Neonatal Morbidity and Mortality in patients who received steroid and patients who did not receive steroid

	Neonatal Morbidity (n=70)	Neonatal Mortality(n=23)
Steroid Uncovered Group (n=62)	43 (61.4%)	19 (82.6%)
Steroid Covered Group (n=45)	27 (38.6%)	(4) (17.3%)

Discussion

Infants delivering before 37 weeks are continuously rising from 11% in 1998 to 12.5% in 2003, according to vital statistics in USA [5]. Incidence of preterm labor is showing an increasing trend due to factors like increased rate of assisted reproductive technology, increased rate of multiple pregnancies early and late procreation and better obstetric intervention the above table compares the incidence of preterm births and their trends in different countries. Among the developing countries India has high incidence of preterm labor

Trend Analysis: Increased trend of preterm birth and low birth weight has been in recent studies [6,7].

Out of 107 cases of preterm deliveries, 62(57.9%) of the cases had delivery on the same day of admission either spontaneous or induced depending upon the indication. ACOG committee in the year 2003 made a similar observation i.e., 30-60% of women presenting with preterm contraction go on to deliver prematurely [2]. Mc Pheeters et al observed that incidence of first time hospitalisation for preterm labor is 9% with only 38% delivering in their first episode [8]. In an analysis of 3728 deliveries in Singapore 571 (15.37%) women who were anaemic at the time of delivery had higher incidence of preterm birth thus the results of several studies are consistent with an association between maternal IDA and greater risk of preterm delivery [3]. Scholl T.O. [12] noticed two fold increase in preterm labor in patients with iron deficiency anemia. In our study out of the 107 cases of preterm delivery 38 (35.5%) of cases had anaemia, 2 cases had HELLP syndrome. This study was done in a rural population where incidence of anaemia is high since adolescent age other factors which could contribute to higher incidence of anaemia in our study were non compliance of iron and folic acid tablets during ANC period, and less than 3 years of gap between two pregnancies.

In the present study 44(41.12%) of the cases with preterm delivery had pregnancy induced hypertension (PIH), A study in African black women by *Samadi AR et al* [13] have found that preterm birth were almost 2 times more likely for women with PIH (OR-1.8; 95% CI 1.5, 2.2) Compared with normal women.

From a POUCH study cohort (Pregnancy Outcome and Community Health) evidence of placental haemorrhage was significantly associated with preterm labor. Few studies have empirically demonstrated an association between subclinical evidence of haemorrhage in delivered placenta and preterm delivery by comparing preterm and

term placenta [3]. In a prior work from the POUCH study, the microscopic haemorrhages' construct was found to be associated with both spontaneous and indicated preterm delivery <35 weeks [15]. In the present study 9 (8.41%) cases had abruption and haemorrhage. *Juliar Warner Gargon et al* in his study concluded that sbruption and ploacental haemorrhage were associated with 2 – fold in increased risk of preterm delivery [14].

In the present study we found out that infection was one of the major etiological factor identified as cause of pre term labour in 35.6%. UTI accounted for 8.5% of cases and vaginitis accounted for 27.1% of cases. According to *Gonclaves et al* [9] intrauterine infections are a major cause of preterm labor with or without intact membranes and account for approximately 25% of cases. *Lamont* [10] concluded that infection is responsible for preterm labour in 40% of cases. *Wright et al* [11] identified UTI as a significant risk factor contributing to 7% of preterm birth. In a study done at lucknow (UP) by *Singh Uma et al* [16] genitourinary infection is the second commonest cause of preterm delivery, ie (20.7%), UTI was present in 8.4% and vaginitis was seen in 12.5% of cases. Apart from this *Wright SP et al* [11] found that smoking and multiparity were modifiable risk factors in pre term labor.

The WHO Reproductive health library (RHL); GENEVA WHO, Revised a document 15 Nov 2002[17], prophylactic antibiotic for inhibiting Preterm labor with intact membranes, the Cochrane review found that antibiotic treatment in women with pre term labor and intact membranes reduces chorioamnionitis / endometritis (RR:0.74;95% CI; 0.64 to 0.87) but has no effect on reduction in preterm births or adverse neonatal outcomes but they also mentioned that most trials from this review were conducted in developed countries and the same review says that in most parts of the sub-Saharan Africa reproductive tract infections (RTI) are highly prevalent and therefore the contribution of pre term birth is higher. The problem is compounded in the developing countries by poor resources allocation and low and late antenatal care attendance. Despite the negative results of the review there is a room for research in the developing country to determine the pattern of genital tract infection in pregnancy and establish local antibiotic policy [17]. In our study in 35% of cases we could prolong the pregnancy up to 36 weeks of gestation with tocolytics and antibiotics.

Review of several studies and meta analysis reports by *C Hubinont* confirms the efficacy of β adrenergic receptor agonist, prostaglandin synthetase inhibitors and Atosiban for delaying delivery for 24-48 hrs [18].

Original Research Article

In present study Neonatal morbidity in steroid covered group was 31% and steroid uncovered group was 76.3%. This can be compared with a study conducted by *Singh Uma et al* [16] where they observed that neonatal morbidity in steroid covered group was 37.5% and steroid uncovered was 52.1%. Incidence of RDS was significantly high in steroid uncovered group. In our study seven babies died in utero due to severe preeclampsia and its complications, 5 babies died in the neonatal period due to hypoxic ischaemic encephalopathy, RDS and septicaemia.

Conclusion

Anaemia, infections and severe preeclampsia are the most common etiological causes of preterm births. Prolongation of pregnancy for 48 hours in selected cases using Tocolytics and Antibiotics reduced neonatal morbidity due to RDS, where the benefit of steroid therapy was obtained. Preterm labour and preterm birth cannot be prevented but incidence can be reduced by proper and appropriate intervention.

Funding: Nil, **Conflict of interest:** Nil

Permission from IRB: Yes

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How to cite this article?

Sunita Sudhir P, Mishra S. A Prospective study of etiology and outcome of Preterm Labour in a Rural Medical College. *Obs Rev: J obstet Gynecol* 2016;2(4):44-48. doi: 10.17511/joog.2016.i04.01.

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