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Original Research Article

A prospective study of risk factors and feto-maternal outcome of preterm labor in OG department of tertiary care centre of South Gujarat

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ABSTRACT

Background: Every year globally, an estimated 15 million babies are born preterm and this number is rising over major parts of the world. Severe morbidity is common in neonates born before 32-34 weeks of gestation. Management of prematurity is a team approach by the obstetrician and the pediatrician.
Methods: This prospective observational study was conducted in the Department of Obstetrics and Gynecology, NCH, Surat from October 2019 to October 2020. 120 consenting consecutive subjects fulfilling inclusion criteria were enrolled.
Results: The most common risk factor for preterm labor in my study was PPROM (premature rupture of membranes). 27% subjects were diagnosed with threatened preterm labor. 22% subjects delivered preterm due to advanced labor. Labor arrest with tocolytic drug nifedipine was attempted in 30 subjects without any complications, which was successful in 19 subjects. The most common maternal complication in preterm labor was postpartum hemorrhage. All neonates were admitted to NICU, amongst them 45 developed complications. The most common complication in preterm neonates was respiratory distress. The rate of early neonatal death was 6.6%.
Conclusions: Inspite of advances in antenatal care and neonatal services, preterm birth remains a burden to families. Strengthening of referral systems to make sure that high risk patients are managed at tertiary care centers with NICU facilities will improve the neonatal outcome.

Keywords: Preterm labor, Labor arrest, Prematurity

INTRODUCTION

As per WHO and International Federation of Gynecologists and Obstetricians (FIGO) 1976, spontaneous preterm labour is defined as labour resulting in birth before 37 completed weeks (259 days) of gestational age based on the first day of the last menstrual period.[1] India has greatest number of preterm births which is about 3.5 million per year.[2] Complications of preterm birth are the major cause of death among children <5 years of age.[3] It is difficult to manage when an infant is born before 37 weeks of gestation as it has lost its normal span of intrauterine development. Severe morbidity such as intraventricular hemorrhage, respiratory distress, bronchopulmonary dysplasia, necrotising enterocolitis is common in neonates born before 32 -34 weeks. There is a need to improve our knowledge of the mechanism of labour in women, to identify diagnostic markers to predict preterm labour and to develop uterine selective drugs to inhibit uterine contractions in a safe and efficient manner. This will be achieved by multidisciplinary research efforts using laboratory and clinical research methods. The risk

factors of preterm birth are idiopathic, hypertensive disorders of pregnancy, antepartum hemorrhage, multifetal gestations etc. Nulliparous women with twin gestation have a higher chance of preterm births.[4] The objective of this study was to study the risk factor of preterm labor and to study the fetomaternal outcome of preterm labor.

METHODS

This prospective observational study was conducted in OG department of New Civil Hospital Surat from October 2019 to October 2020 after Human Research Ethics Committee (HREC) approval. 120 consecutive consenting patients admitted with threatened preterm labor pain and preterm labor pain. After deciding the objectives of study, an excel sheet was made recording all the information of patient. Gestational age assessment was done at the time of admission with preterm labor. Considering the facilities of the neonatal unit, 28 weeks was taken as the lower limit as a period of viability. Patients admitted with threatened preterm labor pain (pain in abdomen, uterine contraction without any cervical changes) and patients with preterm labor pain (pain in abdomen, uterine contraction 3-5 in 10 min, cervical dilatation >2 cm, cervical effacement >80%) were included in the study. Detailed clinical history regarding age, residence, parity, occupation, socio-economic status, number of ANC visits were noted. The Investigations performed were complete blood counts, urine routine micro, vaginal swab culture and sensitivity and ultrasound. Per speculum examination was carried out to diagnose PPROM. The medical risk factors for preterm labor i.e.; hypertension, diabetes, anemia, infections, heart disease and obstetric risk factors i.e.; placenta previa, abruptio placenta, multifetal gestation, eclampsia were evaluated and the patients were managed as per departmental protocol. Out of 120 subjects, 32 subjects had threatened preterm labor pain and 88 subjects presented with established preterm labor. Out of 88 subjects with established preterm labor pain, 27 subjects delivered due to advanced preterm labor. In remaining 61 subjects, 31 subjects delivered preterm due to associated risk factors and 30 subjects without any complications were managed medically with tocolytic drug. Various tocolytic agents include beta mimetics (ritodrine, terbutaline), magnesium sulfate, prostaglandin inhibitors (indomethacin, ketorolac), calcium channel blockers (nifedipine, nicardipine), nitrates (nitroglycerine), oxytocin receptor blockers (atosiban).[13] Calcium channel blockers (CCBs) are non-specific smooth muscle relaxants, predominantly used for the treatment of hypertension and are increasingly used as a tocolytic agent for women in preterm labor.[14] The tocolytic tablet nifedipine was given in the dose of 30 mg P/O stat followed by 10 mg QDS for 24 hours followed by 10 mg TDS for 24 hours followed by 10 mg BD for 24 hours followed by 10 mg OD for 7 days. The data collected was taken and accounting for risk factors of preterm labor, treatment was given for the same. The birth weight and APGAR score were assessed by the neonatologist. Data of postnatal complications i.e.; respiratory distress syndrome, neonatal sepsis, apnea of prematurity, necrotising enterocolitis were collected from NICU (neonatal intensive care unit). The subjects with gestational age <28 weeks and >37 weeks, intrauterine fetal death, intrauterine growth retardation and anomalous fetus were excluded from the study.

RESULTS

Distribution of subjects according to parity and gestational age

Table 1 shows in my study majority of preterm labor is more in nullipara (43.3%) then in Primipara (31.3%) and multipara(25%). Most of the subjects 61% were admitted between 34-37 weeks of gestation, 28% subjects between 32-34 weeks and 11% subjects between 28-32 weeks of gestation.

Table 1: Distribution of subjects according to parity and gestational age.

Variables	Frequency (n=120)	%
Nullipara	52	43.3
Primipara	38	31.6
Multipara	30	25
Gestational age (weeks)		
28-32	13	11
32-34	34	28
34-37	73	61

Distribution of subjects according to risk factors

Table 2 shows that in my study, out of 120 preterm subjects, most common risk factor leading to preterm birth was PPROM (preterm premature rupture of membranes) (31.6%), followed by hypertension (15%), infection (9.1%), antepartum haemorrhage (5.8%), multifetal gestation (5%), sickle cell disease (5.8%), heart disease and respiratory disease (1.6%).

Table 2: Distribution of subjects according to risk factors.

Risk factors	Frequency (n=120) (%)
PPROM	38 (31.6)
Hypertension	18 (15)
Infection	11 (9.1)
Antepartum hemorrhage	7 (5.8)
Sickle cell disease	7 (5.8)
Chorioamnionitis	6 (5)
Multifetal gestation	6 (5)
Respiratory disease	2 (1.6)
Heart disease	2 (1.6)
Idiopathic	23 (19.1)

Distribution of subjects according to labour pain

Table 3 in this study out of 120 subjects, 32 subjects presented with threatened preterm labor pain and 61 subjects presented with early preterm and 27 subjects presented with advanced preterm labor. Out of 61 subjects with early preterm labor, 30 subjects without any complication were managed medically with tocolytic drug and rest of 31 subjects with complications allowed to deliver preterm.

Table 3: Distribution of subjects according to labour pain.

Labour pain	N (n=120)	%
Threatened preterm labor	32	27
Early preterm labor	61	51
Advanced preterm labor	27	22

Distribution of subjects according to labour arrest

Table 4 shows out of 61 subjects presented with early preterm labor pain, 30 patients who were not having any risk factor were arrested with tocolytic drug. Out of those 30, labor arrest was successful in 19 subjects and 11 patients delivered preterm.

Table 4: Distribution of subjects according to labour arrest.

Labour arrest	N (n=30)	%
Arrested	19	63.3
Not arrested	11	36.6

Distribution of subjects according to fetal outcome

Table 5 shows 75 preterm babies were born, amongst them 69 delivered in singleton pregnancy and 6 as a result of multifetal gestation. 67 were live birth, 3 were fresh still birth due to extreme prematurity and 5 were early neonatal death. The cause of early neonatal death were RDS, neonatal sepsis and apnea of prematurity. Most of babies had fetal maturity of 34-37 week followed by maturity of 32-34 weeks followed by 28-32 week of extreme prematurity. Most of babies born with birthweight 2.0-2.5 kg, followed by birth weight 1.5-2.0 kg followed by birth weight<1.5 kg.

Table 5: Distribution of subjects according to fetal outcome.

Fetal outcome	N (n=75) (%)
Live birth	67
Fresh still birth	3
Early neonatal death	5
Fetal weight (kg)	
<1.5	7
1.5-2.0	20
>2.0	48

Distribution of subjects according to maternal complications

Table 6 that in the study most common maternal complication was postpartum hemorrhage, followed by infection (chorioamnionitis + systemic infection), followed by postpartum eclampsia and maternal mortality. The cause of maternal mortality were hepatic encephalopathy in case of sickle cell crisis and acute kidney injury in case of abruptio placenta.

Table 6: Distribution of subjects according to maternal complications.

Maternal complications	N (n=120)	%
PPH	11	15.9
Infection	6	8.6
Postpartum eclampsia	5	7.2
Mortality	2	2.8

Distribution of subjects according to fetal complicatios

Table 7 shows 75 preterm birth all babies were admitted to NICU, 45 developed complications and 30 babies were observed for 24 hours and then discharged as they did not develop any complication.

45 were admitted to NICU. Causes of early neonatal death were respiratory distress syndrome, sepsis and apnoea of prematurity.

Table 7: Distribution of subjects according to fetal complications.

Fetal complications	N (n=75) (%)
Respiratory distress syndrome	14 (18.6)
Neonatal hypoglycemia	12 (16)
Pneumothorax	6 (8)
Sepsis	3 (4)
Necrotizing enterocolitis	3 (4)
Encephalitis	2 (2.6)
Early neonatal death	5 (6.6)

DISCUSSION

In my study the rate of preterm labor is higher in nullipara 43.3%. In my study, the majority of preterm births 61% at gestational age 34-37 weeks (late preterm) followed by 28% in gestational age 32-34 weeks and 11% in gestational age 28-32 weeks, while in a study by Philip et al showed that majority of the preterm births belong to the early preterm births (32-34 weeks).[5]

In present study most common risk factor was PPROM 31.6%, the results are similar to study done by Nungsangtemjen et al in which the rate of PPROM is 47.7%.[6] in 19.1% subjects no risk factors were identified, hypertension (15%) and infection (9.1%) are important causes of PTB similar results seen in study done by

Fernandese et al.[7] In my study, 27% subjects were diagnosed with threatened preterm labor pain, 22% subjects delivered preterm due to advanced labor, 51% subjects were in early phase of labor. In present study 63.3% subjects successfully arrested with tocolytic nifedipine.

A study done by Hawkins et al shows that nifedipine does not affect preterm births and delivery within 48 hours.[8] While in a study by Hangekar et al the success rate of nifedipine was 84.92%.[9] The rate of preterm vaginal delivery is more in my study as compared to Singh et al while rate of preterm LSCS is less.[10] The rate of live birth in present study was 89.33%, early neonatal death rate was 6.6% and the fresh still birth rate was 4% which is similar to study done by Philip et al in which live birth rate was 84%.[5]

In my study, amongst 75 preterm birth, 60% neonates developed complications, majority was respiratory distress syndrome (18.6%), neonatal hypoglycemia (16%), sepsis (4%), narcotising enterocolitis (4%) and encephalitis (2%). Garg et al observed 84% of neonates requiring NICU admission with complications of jaundice in (30%) of neonates followed by asphyxia (18%) and RDS (16%).[11] Chauhan et al also reported higher incidence of jaundice (32.3%), RDS (22.6%) and asphyxia (13.7%) in their study.[12] The most common maternal complication in my study was PPH 15.9%, sepsis 8.6%, postpartum eclampsia 7.2% and maternal mortality 2.8%.

CONCLUSION

Incidence of perinatal morbidity and mortality is still higher in India despite of improvement in ANC care. Identification of risk factors, avoiding the late referral and preventing the preterm labor with the tocolytic will help in reducing the perinatal morbidity and mortality. Nifedipine is safe and effective in prolonging preterm labor and has very less maternal and neonatal side effects. It eliminates the need for intensive maternal monitoring. More calcium channel blockers should be studied which will have selective action on myometrium, thus reducing systemic side effects. The ultimate goal of management of preterm labor should not be just to prolong pregnancy but also to improve fetal outcome and to reduce morbidity and mortality.

Limitations

Small sample size due to migration of people to their native places and COVID-19 pandemic. Exclusion of outside delivery in our study.

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REFERENCES

1. Beck S, Wojdyla D, Say L, Betran AP, Merialdi M, Requejo JH, et al. The worldwide incidence of preterm birth: a systematic review of maternal mortality and morbidity. Bull World Health Organ. 2010;88(1):31-8.
2. Blencowe H, Cousens S, Oestergaard MZ, Chou D, Moller AB, Narwal R, et al. National, regional, and worldwide estimates of preterm birth rates in the year 2010 with time trends since 1990 for selected countries: a systematic analysis and implications. Lancet. 2012;379(9832):2162-72.
3. Perin J, Mulick A, Yeung D, Villavicencio F, Lopez G, Strong KL, et al. Global, regional, and national causes of under-5 mortality in 2000-19: an updated systematic analysis with implications for the Sustainable Development Goals. Lancet Child Adolesc Health. 2022;6(2):106-15.
4. Berghella V. Universal cervical length screening for prediction and prevention of preterm birth. Obstet Gynecol Surv. 2012;67(10):653-8.
5. Philip T, Thomas P. A prospective study on neonatal outcome of preterm births and associated f actors in a South Indian tertiary hospital setting. Int J Reprod Contracept Obstet Gynecol. 2018;7:4827-32.
6. Nungsangtemjen, Mahajan K, Singh MR, Mahongnao Y, Momin DG, Subba T. Fetomaternal outcome in preterm labour. Int J Reprod Contracept Obstet Gynecol. 2021;10:2362-7.
7. Fernandes SF, Chandra S. A study of risk factors for preterm labour. Int J Reprod Contracep Obstet Gynaecol. 2015;4(5):1306-12.
8. Hawkins JS, Wells CE, Casey BM, McIntire DD, Leveno KJ. Nifedipine for Acute Tocolysis of Preterm Labor: A Placebo-Controlled Randomized Trial. Obstet Gynecol. 2021;138(1):73-8.
9. Hangekar P, Karale A, Risbud N. Our experience of nifedipine as a tocolytic agent in preterm labor (24 weeks to 36 weeks 6 days). Int J Reprod Contracept Obstet Gynecol. 2017;6:636-9.
10. Singh J, Kanti V, Verma V. Study of fetomaternal outcome in cases of premature rupture of membrane at tertiary care rural institute of Western Uttar Pradesh, India. Int J Reprod Contracept Obstet Gynecol. 2020;9:77-81.
11. Garg S, Kaur T, Saran AS, Yadav M. A study of etiology and outcome of preterm birth at a tertiary care

centre. Int J Reprod Contracept Obstet Gynaecol. 2017;6(10):4488-91.
12. Chauhan N, Purohit RC, Rawat U. Analysis of Etiology and Outcome of Preterm Labour in Tertiary Health Centre of Uttarakhand. Sch J Applied Medical Sci. 2016;4(3):740-3.
13. Haas DM, Benjamin T, Sawyer R, Quinney SK. Short-term tocolytics for preterm delivery - current perspectives. Int J Womens Health. 2014;6:343-9.
14. Flenady V, Wojcieszek AM, Papatsonis DN, Stock OM, Murray L, Jardine LA, et al. Calcium channel blockers for inhibiting preterm labour and birth. Cochrane Database Syst Rev. 2014;2014(6):CD002255.

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