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Original Research Article

Study of antecedents and risk factors of preterm labour at a tertiary care hospital

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ABSTRACT

Background: Preterm labor is an obstetrics emergency and a threat to population health. The 75% of infant mortality is related to preterm labor. Preterm labor not only inflicts financial and emotional distress on the family, it may also lead to permanent disability (physical or neurological damages) in infants. Aim and objectives were to assess the antecedents and risk factors for preterm labour and their preventive aspects and timely diagnosis of preterm labour, close monitoring and management of labour and providing neonatal care.
Methods: Study design was of prospective study. Study setting was of department of obstetrics and gynecology at tertiary care centre. Study duration from 18 months, study population included were patients getting admitted in preterm labour in hospital during study period. Sample size was of 50.
Results: Mean age of the mothers was 29.7±5.1 years, ranging from 20 to 43 years. It was observed that 84% of the patients were in the age group of 21 to 35 years. 16% of the mothers had GA less than 28 weeks, 28% had GA of 28 to 32 weeks and rest 56% of the mothers had GA of 32 to 37 weeks. Half of all mothers were primigravida, 28% were gravida 2 and rest 22% were gravida 3 or higher. 6% cases with fibroid, 4% had bicornuate uterus and one case had septate uterus. Surgical history of Dilation and curettage in 18%, previous LSCS in 14% and hysterolaparoscopy in 6%.
Conclusions: It is recommended that specialized antenatal care for the patients, who are thought to be at risk of preterm birth, should be performed that can bring down the incidence to some extent.

Keywords: Preterm labour, Antenatal care, Neonatal intensive care

INTRODUCTION

Preterm labour and delivery before 37 weeks of gestation is a principal contributor to perinatal mortality and morbidity.[1] Preterm labor is an obstetrics emergency and a threat to population health. The 75% of infant mortality is related to preterm labor. Preterm labor not only inflicts financial and emotional distress on the family, it may also lead to permanent disability (physical or neurological damages) in infants. The economic cost of preterm birth is high in terms of neonatal intensive care and ongoing health care and educational needs. Social cost is also high, with many families experiencing the sudden loss of preterm baby/ stressful hospital stays, sometimes for months.[2,3]

Despite advances in perinatal medicine in recent decades the problems of preterm delivery continue to frustrate satisfactory reproductive outcomes with little progress having been made in identifying and reducing the frequency of preterm birth.[4-6]

Due to continued innovation in neonatal intensive care facilities and obstetric interventions, fetal survival is now possible even at 20 weeks gestation in developed countries. However, in even the best setups in developing countries, salvage is rare below 28 weeks of gestation.[7]

However, a real reduction in preterm delivery rates will only take place through an improvement in understanding

of physiology of preterm labour, identification of patients at risk, prediction and prevention of its occurrence, early detection of its onset and effective management.[8,9]

Our study aims at studying the etiology, various risk factors, preventive measures, treatment and neonatal outcome in patients admitted with preterm labour so that we are able to achieve a better understanding of the problem which are looking to tackle in the future.

Aim and objectives

Aim and objectives were to assess the antecedents and risk factors for preterm labour and their preventive aspects, timely diagnosis of preterm labour, close monitoring and management of labour and providing neonatal care.

METHODS

Prospective study design was used. Study carried out at department of obstetrics and gynaecology at a tertiary care centre. Study conducted for 18 months.

Study population

Patients getting admitted in preterm labour in hospital during study period

Inclusion criteria

All pregnant women in the age group of 18-40 years. Patients giving their consent for the study. Gestational age more than 24 weeks and less than 37 weeks. Patients coming in preterm labour fulfilling the ACOG criteria for preterm labor were included.

Exclusion criteria

Age less than 18 and more than 40 years. Gestational age less than 24 and more than 37 weeks. Patients with induced preterm labour for medical or surgical indications. Pregnant women with major foetal congenital anomalies incompatible with life detected by USG and intrauterine foetal demise were excluded from the study.

Approval for the study

Written approval from institutional ethics committee was obtained beforehand. Written approval of OBGY department and related department was obtained. After obtaining informed verbal consent from all Subjects were included in the study

Sample size was of 50.

Sampling technique

Using purposive sampling technique, a total of 50 subjects were included in the study.

Methods of data collection and questionnaire

In this study, pregnant women less than 37 weeks gestational age admitted with preterm labor were studied. Patients enrolled in this study were subjected to a detailed history with respect to age, parity, previous pregnancy outcomes and to identify the presence of any risk factors in this pregnancy including presence of GDM, anemia, hypertension or any medical disease. They were evaluated by history taking, clinical examination, and ultrasonography. ACOG criteria for preterm labour was used to document preterm labor and threatened preterm labor viz., at least 4 contractions in a time period of 20 minutes or 8 contractions in a time period of 60 minutes with progressive change in the cervical score in the form of effacement of 80% or more and cervical dilatation greater than 1 cm.

Leaking i.e., rupture of membranes was diagnosed by speculum Examination. Detailed history taking, and general, systemic and obstetrical examinations were done for the presence of polyhydramnios or multiple gestation paying special attention to presence or absence of conventional risk factors for preterm labor.

All women with preterm labor were subjected to ultrasonography to assess the placenta location, fetal maturity estimated fetal weight, cervical length, status of os, amniotic fluid index and they will also be investigated for presence of infection by complete hemogram, and urine and high vaginal swab culture. All women less than 34 weeks will be given 2 doses of betamethasone 12 mg 24 hours apart.

Appropriate intervention will be done to know upto what time period the pregnancy can be extended after the interventions. Also, the neonatal outcome such as birthweight, NICU stay, mortality, etc. will be assessed.

Obstetrical outcomes were recorded in terms of-Gestational age at the time of delivery, mode of delivery vaginal, assisted vaginal delivery/ cesareans delivery, details of perinatal outcome, complications if any

Fetal outcomes recorded in terms of-Apgar score at birth.

Data entry and analysis

The data were entered in Microsoft excel and data analysis was done by using SPSS demo version no 21 for windows. The analysis was performed by using percentages in frequency tables, $p<0.05$ was considered as level of significance using the chi-square test.

RESULTS

In the present study, 50 mothers were included. Mean age of the mothers was 29.7±5.1 years, ranging from 20 to 43 years. It was observed that 84% of the patients were in the age group of 21 to 35 years.

Table 1: Distribution of mothers according to their age.

Age (Years)	N	Total (%)
Up to 20	2	4
21-35	42	84
More than 35	6	12
Total	50	100

Table 2: Distribution of mothers according to their gestational age and gravid status.

Variables	N	Percent (%)
Gestational age (weeks)		
<28	8	16
28 to 32	14	28
32 to 37	28	56
Gravid status		
Primigravida	25	50
G2	14	28
≥ G3	11	22
Total	50	100

It was observed that 16% of mothers had GA less than 28 weeks, 28% had GA of 28-32 weeks and rest 56% of mothers had GA of 32-37 weeks. Half of all mothers were primigravida, 28% gravida 2, rest 22% gravida 3/ higher.

Table 3: Distribution of mothers according to their past anatomical and surgical history.

Variables	N	Percent (%)
Anatomical factors		
Fibroid	3	6
Bicornuate uterus	2	4
Septate uterus (resection done)	1	2
None	44	88
Surgical history		
Dilation and curettage	9	18
Previous LSCS	7	14
Hysterolaparoscopy	3	6
H/O myomectomy	1	2
Op laproscopy i/v/o ectopic pregnancy	1	2
Septal resection	1	2
Exploratory laparotomy	1	2
None	27	54
Total	50	100

There were six percentages cases with fibroid, four percentages had bicornuate uterus and one case had septate uterus. Surgical history of dilation and curettage in eighteen percentages, previous LSCS in fourteen percentages and hysterolaparoscopy in six percentages. There was one case each with history of myomectomy, operative laproscopy i/v/o ectopic pregnancy, septal resection and exploratory laparotomy.

Table 4: Association of cervical dilatation with days prolonged.

Cervical dilatation (cm)		Days prolonged				Total
		Up to 5	6-10	11-15	More than 15	
Up to 1	N	9	1	1	0	11
	%	21.40	33.30	25	0	22
1.1 to 2	N	17	1	2	1	21
	%	40.50	33.30	50	100	42
2.1 to 3	N	11	1	1	0	13
	%	26.20	33.30	25	0	26
3.1 to 4	N	5	0	0	0	5
	%	11.90	0	0	0	10
Total	N	42	3	4	1	50
	%	100	100	100	100	100
		P=0.67				

Table 5: Association of gestational age and birth weight at delivery with birth status.

Variables		Birth type		Total	P value
		Live birth	Still birth		
Gestational age at delivery (weeks)					
< 28	N	3	6	9	<0.01
	%	5.80	75	15	
28 to 32	N	15	1	16	
	%	28.80	12.50	26.70	
32 to 37	N	34	1	35	
	%	65.40	12.50	58.30	
Birth weight (gm)					
Less than 1000	N	2	7	9	<0.01
	%	3.80	87.50	15	
1000 to 1499	N	16	1	17	
	%	30.80	12.50	28.30	
1500 to 2499	N	30	0	30	
	%	57.70	0	50	
≥ 2500	N	4	0	4	
	%	7.70	0	6.70	
Total	N	52	8	60	
	%	100	100	100	

We observed that cervical dilatation was not significantly associated with the number of days pregnancy was prolonged (p=0.67). There was only one case for which pregnancy was prolonged by more than 15 days and that case had cervical dilatation of 1.1 to 2 cm. There were four cases for which pregnancy had to be prolonged by 11 to 15 days, of which two cases had cervical dilatation of 1.1 to 2 cm and one case had 2.1 to 3 cm. Of the three cases for which pregnancy had to be prolonged by 6 to 10 days, one case each had cervical dilatation of up to 1 cm, 1.1 to 2 cm and 2.1 to 3 cm. Of the 42 cases for which pregnancy had to be prolonged by up to 5 days, 21.4% had cervical dilatation of up to 1 cm, 40.5% had 1.1 to 2 cm, 26.2% had 2.1 to 3 cm and 11.9% had 3.1 to 4 cm.

We observed that among still born, seventy-five percentages had gestational age at delivery of less than 28 weeks (p<0.01). In addition, we found that the 87.5% of the still born had birth weight of less than 1000 gm (p<0.01).

Table 6: Distribution of fetus according to APGAR score.

APGAR, (n=52)	Frequency	Percent (%)
0 to 3	0	0
4 to 6	17	32.6
7 to 10	35	67.4
Total	52	100

Of the 52 live births, 32.6% had APGAR score of 4 to 6, and rest 67.4% of the neonates had APGAR score of 7 to 10. Mean APGAR score was found to be 7.5±1.55, ranging from 4 to 10. We observed that in 15 neonates with APGAR score less than six, NICU admission was required.

DISCUSSION

Demography

In the present study, mean age of the mothers was 29.7±5.1 years, ranging from 20 to 43 years. It was observed that 84% of the patients were in the age group of 21 to 35 years.

In another study, Beevi et al studied 105 Antenatal women with gestational age between 28 weeks to 36 weeks 6 days, who got admitted with preterm labour or PPROM in labour room. In their study, the maternal age groups 22 to 30 years was the most common.[13]

Past medical history

We observed that the most common past medical history was that of hypothyroidism and pregnancy induced hypertension in our study, while surgical history of Dilatation and curettage in 18%, previous LSCS in 14% and hysterolaparoscopy in 6%. History of anemia was given by 22% of the mothers.

A study Meis concluded that pregnancies complicated with severe preeclampsia and eclampsia tend to have poor outcomes and the rate of indicated preterm is higher in such cases. Early detection of hypertension and proteinuria and timely interventions to control the disease can bring about a reduction in rates of provider-initiated induction and overall rates of preterm births in this group of patients.[10]

In the study by Jamal and Srivastava, hypertensive disorders of pregnancy (18.6%), fetal growth restriction (12.4%), and anemia was found to be associated with 12.6% of the cases.[11] In a similar study by Jaju et al, out of 285 patients, 187 (65.6%) had some significant medical history, i.e.: 65.6% patients with comorbidities were on tocolytics. Hypertension (77 [27.02%]), followed by previous preterm delivery history (67 [23.51%]) were the most commonly reported comorbidities.[12]

Obstetric factors

In the present study, it was observed that 16% of the mothers had GA less than 28 weeks, 28% had GA of 28 to 32 weeks and rest 56% of the mothers had GA of 32 to 37 weeks. Half of all mothers were primigravida, 28% were gravida 2 and rest 22% were gravida 3 or higher. 26% reported bleeding per vaginum in the first or second trimester. At 20 weeks, cervical length was less than 2.5 cm in 10%, 2.5 to 3 cm in 42% and more than 3 cm in 48%.

It was observed that significantly high proportion of mothers had cervical encerclage done with cervical length less than 2.5 cm as compared to those with cervical length more than 3 cm (p<0.05). In addition, significantly higher proportion of mother took progesterone who had cervical length less than 2.5 cm as compared to those with cervical length more than 3 cm (p<0.05).

It was observed that 28% of the mothers had 25% effacement, 58% had 25 to 50% effacement and rest 14% of the cases had more than 50% effacement. We also observed that 24% of the patients had PROM.It was observed that 42% mothers had cervical dilatation of 1-2 cm, 26% mothers had cervical dilatation of 26%.

In another study, Beevi et al 62% of the mothers had gestational age of more than 34 weeks.[13] Aggarwal et al reported that median cervical dilatation at admission was 2.5 cm, ranging from 1 to 4 cm, with median effacement of 60% at admission. Jamal and Srivastava reported that elderly gravidas (23.9%) was common and multiparity, an independent risk factor observed in our study, was found to be associated with 47.5% cases. In their study, the commonest risk factor for preterm labor was PPROM (26.6%). Furthermore, maximum patients delivered at a period of gestation between 34-36.6 weeks i.e., late preterm group (53%), followed by moderate preterm 26.4%. But early preterm deliveries also had a high proportion of 20.6%, and most of these cases were due to severe preeclampsia or eclampsia (80.6%).[11]

Jaju et al reported that 49.12% were primigravida, while remaining 50.88% were multigravida.[12] More than half of the patients 58.25% were primipara and 41.75% were multipara. In another study by Manuck et al mothers who received tocolysis had mean gestational age at delivery of 28.9±2.7 weeks. In their study only 1.7% of the mothers delivered at 34 weeks of gestation or more. Median cervical dilatation at admission was 5 cm, ranging from 4 to 5.5 cm. In their study, 23.6% of the mothers included had a history of previous preterm delivery and the incidence of preterm PROM was 47.2%. Jaju reported that of the 50 mothers, the mean gestation age was 31.5±2.6 weeks at the baseline and majority of the patients were multigravida (58.0%). The mean cervical dilatation was

1.8±0.5 cm and mean cervical effacement was 26.4±17. The mean gestational age at delivery was 39.8±2.1 weeks, with a mean latency period of 58.5±18.7 days.[12]

Pregnancy outcome

LSCS was performed in 48% and rest had preterm vaginal delivery.

The indications for which LSCS was done were GA less than 32 weeks, Twin gestations, ART, previous history of LSCS, Bad obstetric history and precious pregnancy.

In another similar study, Jamal and Srivastava observed a labor induction rate of 23.4% and caesarean delivery was performed in 146 (33.5%) cases, thus indicating a high induction and caesarean rates in such pregnancies.[11]

Neonatal outcomes and NICU stay

In the present study, it was found that 10 mothers had twins and rest were single births. So total 60 fetuses were observed in the study. Of these, 8 were still born and 52 were live births. Of the 52 live births, 32.6% had APGAR score of 4 to 6, and rest 67.4% of the neonates had APGAR score of 7 to 10. Mean APGAR score was found to be 7.5±1.55, ranging from 4 to 10. We observed a significant association between gestational age at delivery and the birth status. Among 8 still births, 75% had gestational age of less than 28 weeks at the time of delivery. In addition, we found that 87.5% of the still born had birth weight of less than 1000 gm which was a significant association.

Mean birth weight of the neonates was found to be 1605±564, ranging from 540 to 2870 gm. In a similar study by Aggarwal et al, mean birth weight of the neonates was 2266.76±726.9 gm.

CONCLUSION

The results of the present study show that prolongation of pregnancy is safe in mothers presenting with preterm labor. It is recommended that specialized antenatal care for the patients, who are thought to be at risk of preterm birth, should be performed that can bring down the incidence to some extent. Screening for genital infections, for urinary tract infections and treating them can also achieve the target for diminishing the rates. Provider initiated preterm birth can be minimized by early detection of risk factors and prompt intervention to minimize their effects.

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