



Study of Risk Factors for Preterm Labour

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Introduction

The incidence of preterm labour varies between 5 and 11% of pregnancies worldwide. In India it is 7 to 10 % of total births. Preterm labour is defined as the presence of uterine contractions of sufficient frequency and intensity to effect progressive effacement and dilatation of cervix prior to 37 weeks of gestation. The etiology of preterm labour is multifactorial and many times the cause is not clearly understood. Successful reduction of perinatal morbidity and mortality associated with prematurity requires effective risk identification and behavioral modification programs for the prevention of preterm labour.

Objectives of the study

To study the influence of socioeconomic status, maternal age, previous obstetrics outcome, association of short cervix, maternal disease and infections, associated obstetric complications and the perinatal outcome in preterm labour.

Materials and Methods

The study was a case control study conducted in a tertiary care teaching hospital in kerala for a period of one year. Study population includes 150 consecutive cases of women with spontaneous onset of preterm labour (uterine contractions of 2

or more in 10 minute, Cervical effacement >80%) between 28 to 37 weeks gestation admitted during the study period and 150 women with gestational age beyond 37 weeks with spontaneous onset of labour satisfying the inclusion criteria were selected randomly as control group. Women with ruptured membranes and induced labour are excluded in both cases and control group. After admission to labour room, patients were interviewed for various risk factors, examined to confirm preterm labour, records both previous and in current pregnancy reviewed and investigations done.

Data Analysis

Statistical analysis was done using SPSS version 16.0 for windows. Data was analyzed by Chi-square test for association. Risk factors were identified by binary logistic regression. Risk was estimated in terms of odds ratio and 95% confidence interval for OR ratio was also calculated. P value <0.05 was considered to indicate statistical significance.

Salient findings

Statistically significant findings include

1. Distribution according to socioeconomic status : 70.67% of patients with preterm onset of labour belonged to lower socioeconomic status

compared to only 42% in the control group OR =3.33 (95% CI 2.01 -5.53) P value = 0.0001

Socioeconomic Status	Cases (n=150)		Control (n=150)	
	No	%	No	%
Low	106	70.67%	63	42%
Middle	39	26%	87	58%
High	5	3.33%	0	0%

2. Age wise distribution: Study group 34% of patients were <20yrs of age while only 20% in the control group were <20yrs of age. OR = 2.16 (95% CI 1.23 – 3.78). P value = 0.0039.

Age Group	< 20yrs		21-25 yrs		26-30 yrs		31-35 yrs		>35 yrs	
	No	%	No	%	No	%	No	%	No	%
Cases (n=150)	51	34	49	32.66	36	24	8	5.3	6	4
Control (n=150)	30	20%	76	50.66	35	23.33	7	4.66	2	1.3

3. Gravida Distribution: The incidence was found to be high in gravida four and above (12%) in the cases compared to control group (4.67%). OR = 3.16 (95% CI 1.16 – 8.89) P value = 0.0119.

Gravida	1		2		3		4		5		>5	
	No	%	No	%	No	%	No	%	No	%	No	%
Cases	62	41.33	42	28	27	18	9	6	7	4.67	2	1.3
Control	57	38	60	40	26	17.33	4	2.67	2	1.3	1	0.67

4. Previous obstetric statistics: 25.33% of cases in the preterm labour group had previous history of abortion, while only 15.3% patient in the control group had history of previous abortion OR=1.87 (95% CI 1.01 – 3.47) P value = 0.031. 12.67% of patient in the study group had history of previous preterm delivery compared to 1.33% of patient in the control group. OR = 10.73 (95% CI 2.35 – 68.01) P value = 0.0001.

History		Cases (n=150)		Control (n=150)		Odds ratio	95% confidence interval	P value
		No	%	No	%			
Abortion	Yes	38	25.33	23	15.3	1.87	1.01-3.47	0.031
	No	112	74.66	127	84.67			
Preterm delivery	Yes	19	12.67	2	1.33	10.73	2.35-68.01	0.0001
	No	131	87.33	148	98.67			
IUD/NNP	Yes	18	12	9	6	2.14	0.87-5.35	0.069
	No	132	88	141	94			

5. History of Coitus: There was 13.3% patients in the study group with history of recent coitus compared to 2% in the control group OR = 7.54 (95% CI 2.96 – 32.66) . P value = 0.002.

		Cases (n=150)		Control (n=150)		Odds ratio	95% confidence interval	P value
		No	%	No	%			
H/o. Coitus	Yes	20	13.3%	3	2%	7.54	2.96 – 32.66	0.0002
	No	130	86.67%	147	98%			

6. Current Pregnancy complications: Study group 16% of patients had PIH compared to 8% in the control group. OR = 2.19 (95%CI 1-4.89) P value = 0.033 (P <0.05), 12.66% patients in the study group had multiple pregnancy compared to 3.34% in the control group. OR = 4.21 (95% CI 1.43 – 13.27). P value= 0.003. There was 5.3% incidence of hydramnios among preterm labour patients compared to 0.6% among term patients. OR = 8.39 (95% CI 1.05 – 181.19) P value =0.036

Complications		Cases (n=150)		Control (n=150)		Odds ratio	95% confidence interval	P value
		No	%	No	%			
PIH	Yes	24	16	12	8	2.19	1-4.87	0.033
	No	126	84	138	92			
GDM	Yes	9	6	10	6.66	0.89	0.32-2.47	0.813
	No	141	94	140	93.34			
H/o bleeding P/V	Yes	8	5.3	6	4	1.35	0.41-4.52	0.584
	No	142	94.67	144	96			
Multiple pregnancy	Yes	19	12.66	5	3.34	4.21	1.43-13.27	0.003
	No	131	87	145	96.67			
Hydrarnnis	Yes	8	5.3	1	0.66	8.39	1.05-181.19	0.036
	No	142	96.67	149	99.33			

7. Short cervix: 16.66% of the patients in the study group had short cervix (<26mm) detected at second trimester USG while 2.66% in the control

group had cervical shortening OR = 7.3 (95% CI 2.33 – 25.48). P value = 0.0004.

PPV is = 86.2% NPV = 53.87%.

Short Cervix	Cases (n=150)		Control (n=150)		Odds ratio	95% confidence interval	P value
	No	%	No	%			
Yes	25	16.66%	4	2.66%	7.3	2.33-25.48	0.00004
No	125	83.33	136	97%			

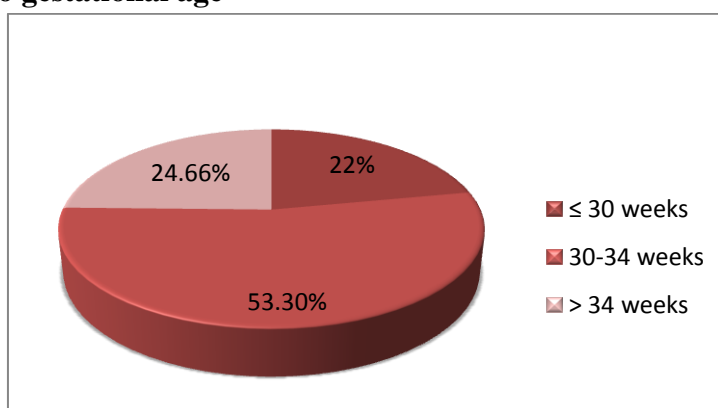
8. Infections: Urinary tract infection was present in 24.67% of patients in the study group compared to 10% of patients in the control group. OR = 2.95 (95% CI 1.47 – 5.95). P value = 0.008. Among patients with preterm labour 18 had vaginal infections compared to 2 in the control group. OR = 10.09 (95% CI 2.19 – 64.19). P value = 0.0002.

The incidence of chorioamnionitis was 20 in the study group compared to 3 in the control group. OR = 7.54 (95% CI 2.06-32.66).

P value = 0.0002. Compared to control group overall infection rate was high among patients with preterm labor. OR = 8.48 (95% CI 3.67 – 20.3). P value = <0.00001.

Complications		Cases		Control		Odds ratio	95% confidence interval	P value
		No	%	No	%			
Urinary tract infections	Yes	37	24.67%	15	10	2.95	1.47-5.95	0.0008
	No	113	75.33%	135	90			
Other Infections		Case		Control		P value		
Vaginitis		18		2		0.0002		
chorioamnionitis		20		3		0.0002		
UR TI		7		3		0.198		
Viral hepatitis		1		0		0.5		
Measles		1		0		0.5		
Mumps		1		0		0.5		
A/c pancreatitis		1		0		0.5		
Overall		49		8		<0.00001		

9. Incidence according to gestational age



Majority of the cases were between 30-34 weeks of gestational age

Statistically not significant findings include

1. Primigravida (41.33% Vs 38%) with an OR = 1.34 (95% CI 0.81-2.22) P value = 0.234.
2. Previous history of IUD/NND (12% Vs 6%) with an OR = 2.14 (95% CI 0.87-5.35) P value = 0.069.
3. H/o. bleeding PV (5.3% Vs 4%) with an OR =1.35(95% CI 0.41-4.52) P value = 0.584.
4. GDM (6% Vs 6.6%) with an OR = 0.89 (95% CI 0.32-24.7) P value =0.813.

Binary Logistic Regression

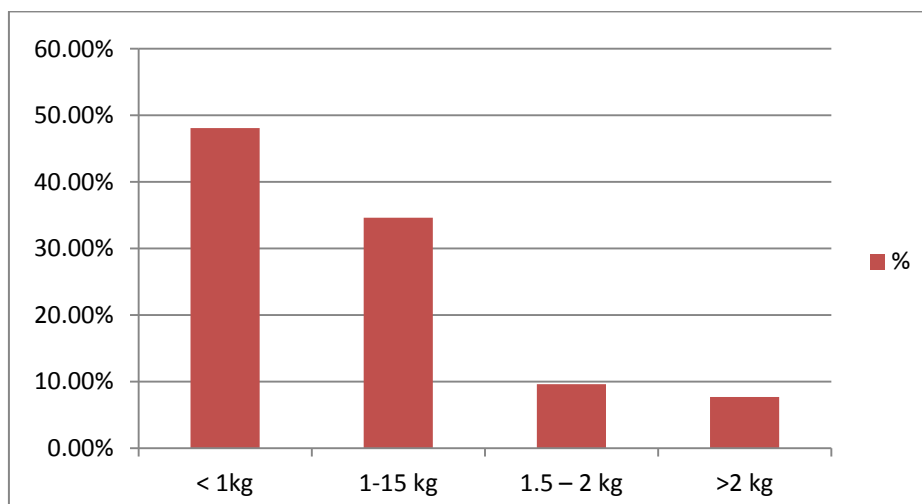
Variables, age <20 yrs, low socioeconomic status, Gravida ≥4, previous abortion, preterm delivery, H/o. coitus, PIH, UTI, Vaginitis, chorioamnionitis, hydramnios, multiple pregnancy and short cervix which were found to be associated with preterm delivery were included in a binary logistic regression model to find the risk factors of preterm delivery. Among these variables, the following variables were found to be the risk factors for spontaneous preterm delivery.

Variables	OR	95% CI	P value
Age < 20 yrs	2.508	1.312 – 4.794	0.005
Low SE status	2.651	1.493 – 4.706	0.001
Gravida ≥ 4	3.257	1.115 – 9.517	0.031
H/o. PTD	6.94	1.35 - .35.68	0.02
PIH	2.909	1.25 – 6.77	0.013
Multiple pregnancy	3.166	1.008-9.944	0.048
Hydramnios	10.373	1.226-87.73	0.032
H/o coitus	5.674	1.451-22.195	0.013
Vaginitis	8.04	3.26 -16.84	0.042
chorioamnionitis	4.185	1.040-16.84	0.004
Short cervix	3.629	1.039-12.672	0.043

Perinatal outcome: Perinatal mortality was significantly higher in preterm infants (30.40% Vs

3.87%) with preterm neonates being at higher risk for asphyxia, RDS, sepsis and hyperbilirubinemia.

	Cases		Control	
	No	%	No	%
Total no.of cases	150		150	
Total no of babies	171		155	
Total no.of NND	36	21.05	2	1.29%
Total no.of FSB	16	9.35%	4	2.58%



Discussion

Preterm labour with subsequent delivery of premature newborn remains the largest cause of perinatal mortality and morbidity worldwide. Despite major advances in obstetrics and neonatal care, the preterm birth remains constant at 10-12% of pregnancies¹. The etiology of preterm labour is multifactorial and the premature babies are at increased risk of specific diseases related to immaturity of various organ systems, difficulties in learning and academic achievement, language performance and behavioural problems².

This study was aimed at assessing the various risk factors for spontaneous preterm labour, as early identification of risk factors and timely referral for specialized obstetrical care and appropriate prenatal management can decrease the spontaneous preterm birth and morbidity and mortality associated with prematurity.

In our study Teenage patients, grand multiparous women and women from low socioeconomic group have a higher risk of preterm labour³⁻⁵. Previous preterm delivery was associated with high risk of preterm labour in subsequent pregnancy^{6,7}. Pregnancy with hypertensive disorders and conditions causing uterine over distension like multiple pregnancy, hydramnios were associated with increased incidence of preterm labour⁸⁻¹⁰. Maternal infection especially vaginal infections, chorioamnionitis and short cervix at 2nd trimester USG were associated with increased risk of preterm delivery¹¹⁻¹⁵. Sexual intercourse was found to be a triggering factor for preterm labour. Previous abortions, previous intrauterine death / neonatal death, bleeding PV, medical disorders like gestational diabetes, urinary tract infection etc were not found to be a risk factor for spontaneous preterm delivery⁸. Perinatal mortality was significantly higher in preterm infants with preterm neonates being at higher risk for asphyxia, respiratory distress syndrome, sepsis and hyperbilirubinemia.

Conclusion

- 1) Patients with multiple risk factors like teenage patients and the grand multiparous women from low socioeconomic status or those with history of previous preterm labour, short cervix on 2nd trimester USG, multiple pregnancy, hydramnios etc should be identified and counselled about the propensity of preterm labour and educated regarding warning signals.
- 2) In such patients preventive measures like modifying work environment, preventing undue stress, avoiding strenuous work and coitus etc should be encouraged.
- 3) Infections like urinary tract infection, vaginitis and chorioamnionitis should be actively looked for and promptly managed.
- 4) Increasing the age at 1st pregnancy by effective health education and improving the general socioeconomic status would also help.
- 5) Access to special care newborn units (SCNU) facilities should be arranged, with in utero transfer being the most preferred and improving neonatal care.

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