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Original Research Article

A Retrospective Study on Maternal Factors associated with Preterm Birth at Sri Guru Ram Das Hospital, Amritsar, Punjab

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ABSTRACT

Pre-term birth (PTB) is a major determinant of neonatal mortality, morbidity and childhood disability and remains one of the most serious problems. PTB is defined as gestational age at birth of less than 37 completed gestational weeks. It is further classified into three main categories: mild, very pre-term and extremely pre-term for births occurring at 32–36 weeks, 28–31 weeks and less than 28 weeks respectively, with average frequencies of 85%, 10% and 5%, respectively. A retrospective study was conducted on maternal factors for preterm birth. Data was collected from preterm documents (files) at Sri Guru Ram Das Hospital, Amritsar, Punjab. Enumerative sampling technique was used for selection of sample. A self made checklist of maternal factors was used for collecting data. Data included socio-demographic variables of mother and preterm baby, clinical parameters of mother & preterm baby and the maternal factors. Data analysis was done with the use of statistical software SPSS 17.0. The study results revealed that 37.3% (38) of the mothers were having antepartum hemorrhage, 22.5% (23) were having PPROM, 17.6% (18) had abortion history, 16.7% (17) had oligohydramnios, and 13.7% (14) were having pregnancy induced hypertension as factor for preterm birth. Maternal factors found significantly associated with preterm birth were PPROM (F =5.659, p-value=0.001), Twins (F =6.567, p-value=0.000) and Underwent ART (F=2.223, p-value=0.05). Association of maternal factors such as diabetes (p value = 0.000), hypothyroidism (p value = 0.000), drugs before pregnancy (p value = 0.000) and still birth (p value = 0.001) were found significantly associated with socio-demographic variable i.e. religion. Similarly, maternal factor PPROM was found significantly associated (p value = 0.011) with birth weight of baby at p value <0.05.

Keywords: preterm birth, maternal factors, retrospective study.

INTRODUCTION

The healthy newborn infant born at term, 38 to 42 weeks, cries immediately after birth, establishes independent rhythmic respiration, quickly adapts with the extra-uterine environment, having an average birth weight and no congenital anomalies. The period from birth to 28 days of life is called neonatal period and the infant in this period is termed as neonate or newborn baby. The first week of life is known as early neonatal period and the late neonatal period extends from 7th to 28th days of life.[1]

Pre-term birth (PTB) is a major determinant of neonatal mortality, morbidity and childhood disability and remains one of the most serious problems in obstetrics. PTB is defined as gestational age at birth of less than 37 completed gestational weeks. It is further classified into three main categories: mild, very pre-term and extremely pre-term for births occurring at 32–36 weeks, 28–31 weeks and less than 28 weeks respectively, with average frequencies of 85%, 10% and 5%, respectively. [2] Despite major preventive

efforts, the incidence of PTB has remained constant at about 5–10% of live births in most countries over the past two decades. [3]

In 75% of PTB cases no obvious causes have been established, but several etiological risk factors have been identified. Non-obstetric risk factors include: poor socio-economic status, maternal malnutrition, illiteracy, maternal age of <20 and >35 years, heavy manual work, cigarette smoking, long distance travel, and trauma. Obstetric risk factors associated with PTB include: cervical incompetence, multiple gestations, short birth intervals, abortion, pre-labor premature rupture of membrane (PPROM) and previous PTB. [4]

Every year, 1.09 million children under age 5 die due to health complications that stem from being born before week 37 of pregnancy. According to WHO report November 2014: Every year, an estimated 15 million babies are born preterm (before 37 completed weeks of gestation), and this number is rising. That is more than 1 in 10 babies. Preterm birth complications are the leading cause of death among children under 5 years of age, responsible for nearly 1 million deaths in 2013.

Three-quarters of them could be saved with current, cost-effective interventions. Across 184 countries, the rate of preterm birth ranges from 5% to 18% of babies born. Almost 1 million children die each year due to complications of preterm birth. Many survivors face a lifetime of disability, including learning disabilities and visual and hearing problems. [5]

Common causes of preterm birth include multiple pregnancies, infections and chronic conditions, such as diabetes and high blood pressure; however, often no cause is identified. Other causes can be late or no health care during pregnancy, Smoking, Drinking alcohol, Using illegal drugs, Domestic violence, including physical, sexual, or emotional abuse, Lack of social support, Stress, Long working hours with long periods of standing, Exposure to certain environmental pollutants, etc. [5]

According to the report (Bangalore), preterm births in India are approximately 21% and rising. Increased frequency of multiple births, young or advanced maternal age, low maternal body mass index, short inter-pregnancy intervals, infection and increasing stress are some reasons cited by the report for preterm births. [6]

In 2012 (CDC report), preterm birth affected more than 450,000 babies—that's 1 of every 9 infants born in the United States. Preterm birth is the birth of an infant before 37 weeks of pregnancy. Preterm-related causes of death together accounted for 35% of all infant deaths in 2010, more than any other single cause. Preterm birth is also a leading cause of long-term neurological disabilities in children. Preterm birth costs the U.S. health care system more than $26 billion in 2005. [7]

Better understanding of the causes and mechanisms will advance the development of solutions to prevent preterm birth due to maternal factors. So this study is conducted to find out the various maternal factors associated with the preterm birth and to reduce the burden of preterm birth by developing solutions to prevent it.

Assumption: Various maternal factors are associated with preterm birth.

Objectives

1. To identify the maternal factors associated with preterm birth.
2. To find out the association of pre-term birth with maternal risk factors.
3. To find out the association of pre-term birth with selected socio-demographic variables.

MATERIALS AND METHODS

The quantitative research approach was adopted with non-experimental retrospective research design on maternal factors for preterm birth. The study was conducted at SGRD Hospital and medical college, Amritsar. It is one of the pioneers medical and nursing educational institute in the state. Over the years it was grown in the every sphere and renders services in all specialization. The researcher recruited 102

samples (files) through enumerative sampling with inclusion and exclusion criteria. Data was collected from preterm documents (files) from 1st January 2015 to 1st January 2016. Research tool was consisted of three parts- part-I Socio-demographic profile of mother and baby, part-II Clinical parameters of mother & preterm baby and part-III Checklist of maternal factors for preterm birth. Tool was prepared by various level of literature and validated by expert of nursing, pediatrics, obstetrics and gynecology. Ethical permission was obtained from ethical and research committee of Sri Guru Ram Das Institute of Medical Sciences and Research (SGRDIMSR), Amritsar, Punjab. After gaining the approval, permission was taken from the Director Principal to conduct research study. Confidentiality and anonymity were maintained during and after data collection. The reliability of tool was estimated by Cronbach's alpha method and it was found to be 0.743 in this study. Data analysis was done with the use of statistical software SPSS 17.0.

RESULTS

Table 1 (a): Frequency and percentage distribution of socio-demographic characteristics N = 102

Sr. No	Socio-demographic Variables	f	%
Mother			
1.	**Age of Mother (in years)**		
	20-25	11	10.8
	26-30	15	14.7
	31-35	06	05.9
	>35	01	01.0
	Didn't mention	69	67.6
2.	**Religion**		
	Hindu	18	17.6
	Sikh	83	81.4
	Christian	01	01.0
3.	**Habitat**		
	Rural	71	69.6
	Urban	31	30.4
Preterm Baby			
4.	**Birth weight of baby (in grams)**		
	<1000	07	06.9
	1000-1500	25	24.5
	1500-2000	39	38.2
	>2000	31	30.4
5.	**Gestational age (in weeks)**		
	>28	07	06.9
	29-32	34	33.3
	33-36	47	46.1
	>37	14	13.7
6.	**Gender**		
	Male	71	69.6
	Female	31	30.4

N.B. f= frequency, %= percentage

Table 1 (a) depicts that majority of the files (67.6%) mother's age was not mentioned. Most of the mothers (81.4%) were belonging to Sikh religion and were residing in rural area (69.6%). Most of the preterm babies (38.2%) were having birth weight 1500-2000gms, (46.1%) born at gestational age 33-36 weeks of which 69.6% were males.

Table 1 (b): Frequency and percentage distribution of clinical characteristics N = 102

Sr. No	Clinical characteristics	f	%	Mean± SD
Mother				
1.	**Blood group**			
	A+	24	23.5	
	B+	28	27.5	
	AB+	11	10.8	
	O+	21	20.6	
	A-	03	02.9	
	B-	01	01.0	
	AB-	01	01.0	
	O-	03	02.9	
	Didn't mention	10	09.8	
2.	**Number of living children**			
	0	60	58.8	1.48±.625
	1	35	34.3	
	2	07	06.9	
3.	**Number of pregnancies**			
	1	46	45.1	1.84±.909
	2	31	30.4	
	3	20	19.6	
	>3	05	04.9	
4.	**Number of deliveries**			
	1	56	54.9	1.64±.806
	2	29	28.4	
	3	15	14.7	
	>3	02	02.0	
5.	**Type of Delivery**			
	NVD	40	39.2	
	LSCS	62	60.8	
Preterm baby				
6.	**At Birth condition**			
	Normal	69	67.6	
	Asphyxia	33	32.4	
7.	**Disease condition**			
	No	26	25.5	
	RDS	68	66.7	
	Jaundice	03	02.9	
	TEF	04	03.9	
	NEC	01	01.0	

N.B. f= frequency, %= percentage, SD= Standard Deviation, NVD=Normal Vaginal Delivery, LSCS= Lower Segment Caesarean Section, RDS=Respiratory Distress Syndrome, TEF= Tracheo Esophageal Fistula, NEC= Necrotizing Enterocolitis

Table 1 (b) represents that mothers (27.5%) were having B+ blood group. Majority of the mothers (58.8%) were having no living children (mean ± SD= 1.48±0.625), 45.1% had 1st pregnancy (mean ± SD= 1.84±0.909). Nearly half of the mothers (54.9%) were having first delivery (mean ± SD = 1.64±0.806) and

majority of the mothers (60.8%) delivered by LSCS. Most of the babies (67.6%) were normal at birth and 66.7% developed RDS.

Table 2: Frequency and percentage distribution of maternal factors for preterm birth N=102

Sr. No	Maternal factors	f		%	
		Present	Absent	Present	Absent
	Before Pregnancy				
1.	Diabetes	2	100	02.0	98.0
2.	Hyperthyroidism	0	102	00.0	100.0
3.	Hypothyroidism	5	97	04.9	95.1
4.	Hypertension	1	101	01.0	99.0
5.	Drugs before pregnancy	6	96	05.9	94.1
	Past Antenatal History				
6.	Abortion	18	84	17.6	82.4
7.	Still birth	7	95	06.9	93.1
8.	Preterm birth	1	101	01.0	99.0
	Antenatal History				
9.	PPROM	23	79	22.5	77.5
10.	Antenatal visit	102	00	100.0	00.0
11.	Antepartum hemorrhage	38	64	37.3	62.7
12.	Gestational Diabetes Mellitus	1	101	01.0	99.0
13.	Pregnancy Induced Hypertension	14	88	13.7	86.3
14.	Polyhydramnios	2	100	02.0	98.0
15.	Oligohydramnios	17	85	16.7	83.3
16.	Twins	7	95	06.9	93.1
17.	Malpresentation	8	94	07.8	92.2
18.	Rh-isoimmunization	2	100	02.0	98.0
19.	Supplements	102	00	100.0	00.0
20.	Immunization	102	00	100.0	00.0
21.	Underwent ART	2	100	02.0	98.0
22.	Drugs during pregnancy	13	89	12.7	87.3

NB. f= frequency, %= percentage, PPROM=Pre-term Premature Rupture of Membrane, ART=Assisted Reproductive Technology

Table 2 describes that (37.3%) of the mothers were having antepartum hemorrhage, (22.5%) mothers were having PPROM, (17.6%) had abortion history, (16.7%) had oligohydramnios, and (13.7%) were having pregnancy induced hypertension as factor for preterm birth.

Table 3: Association of pre-term birth with maternal risk factors N=102

Sr. No.	Factors	Means ±SD	df		F-value	p-value
			Between Group	Within Group		
1.	Diabetes	1.98 ±.139	3	98	.916	.436^{NS}
2.	Hypothyroidism	1.95 ±.217	3	98	1.956	.126^{NS}
3.	Hypertension	1.99 ±.099	3	98	.383	.766^{NS}
4.	Drugs before pregnancy	1.94 ±.236	3	98	1.622	.189^{NS}
5.	Abortion	1.82 ±.383	3	98	.310	.818^{NS}
6.	Still birth	1.93 ±.254	3	98	.528	.664^{NS}
7.	Preterm birth	1.99 ±.099	3	98	.383	.766^{NS}
8.	PPROM	**1.77 ±.420**	**3**	**98**	**5.659**	**0.001***
9.	Antepartum haemorrhage	1.62 ±.508	3	98	1.594	.196^{NS}
10.	Gestational diabetes	1.99 ±.099	3	98	.383	.766^{NS}
11.	Pregnancy Induced Hypertension	1.86 ±.346	3	98	.540	.656^{NS}
12.	Polyhydramnios	1.98 ±.139	3	98	.783	.506^{NS}
13.	Oligohydramnios	1.83 ±.375	3	98	1.268	.290^{NS}
14.	Twins	**1.93 ±.254**	**3**	**98**	**6.567**	**0.000***
15.	Malpresentation	1.92 ±.270	3	98	.767	.515^{NS}
16.	Rh-isoimmunization	1.98 ±.139	3	98	.783	.506^{NS}
17.	Underwent ART	**1.98 ±.139**	**3**	**98**	**2.223**	**0.050***
18.	Drugs during pregnancy	1.87 ±.335	3	98	.229	.876^{NS}

*NB: NS= Non-significant (p-value>0.05), *= Significant (p-value <0.05), PPROM=Pre-term Premature Rupture of Membrane, ART=Assisted Reproductive Technology*

Table 3 depicts that maternal factors PPROM (F =5.659, p-value=0.001), Twins (F =6.567, p-value=0.000) and Underwent ART (F=2.223, p-value=0.050)) were significantly associated with pre-term birth. Remaining factors were non-significant because p-value was >0.05.

Table 4: Association of maternal factors with selected socio-demographic variables N=102

Sr. No	Maternal factors	χ^2 Value	df	p-value
		Religion		
1.	Diabetes	50.607	2	.000*
2.	Hypothyroidism	19.712	2	.000*
3.	Drugs before pregnancy	16.173	2	.000*
4.	Still birth	13.711	2	.001*
		Birth weight of baby (in grams)		
5.	PPROM	11.084	3	.011*

*NB. df= degree of freedom * Significant (p-value<0.05)*

Table 4 presents that maternal factors diabetes (p-value = 0.000), hypothyroidism (p-value = 0.000), drugs before pregnancy (p-value = 0.000) and still birth (p-value = 0.001) were significantly associated with socio-demographic variable i.e. religion. Similarly, maternal factor PPROM was significantly associated (p value = 0.011) with birth weight of baby at p value <0.05.
Note: Remaining maternal factors were non-significant because p-value was >0.05.

DISCUSSION

The study was conducted to assess the maternal factors associated with preterm birth. The results revealed that maternal factors PPROM (F =5.659, p-value=.001), Twins (F =6.567, p-value=.000) and Underwent ART (F=2.223, p-value=.050)) were significantly associated with pre-term birth. Similar study conducted by Pinborg A et al (2009) to evaluate cervical conization as the risk of preterm and very preterm birth in assisted reproductive technology (ART) twin pregnancies in Denmark revealed that in ART twin deliveries, the prevalence of PTB was 58.2 versus 41.3% in women with and without conization, respectively, with an OR 1.94 (95% CI 1.36-2.77), and the risk of VPTB was also doubled. [8]

The present study findings showed that 37.3% (38) of the mothers were having antepartum hemorrhage, 22.5% (23) mothers were having PPROM, 17.6% (18) had abortion history, 16.7% (17) had oligohydramnios, and 13.7% (14) were having pregnancy induced hypertension (PIH) as factor for preterm birth. This is congruent with findings from other studies conducted by Megha S. Pate et al (2011) which showed that incidence of PIH was found in 360 cases (18%) out of 2000 cases of pregnancy. PIH was one of the most important causative factors for low birth weight babies by preterm and IUGR. [9] Madhusudan Dey et al (2014) revealed that there was increase incidence of late preterm birth with hypertensive disorder of pregnancy (21%), maternal anemia (9%), PPROM (13.5%) and gestational diabetes mellitus and ART 6% and 4% respectively. [10]

Regarding the findings of present study it was found that maternal factors such as diabetes (p value = 0.000), hypothyroidism (p value = 0.000), drugs before pregnancy (p value = 0.000) and still birth (p value = 0.001) are significantly associated with socio-demographic variable i.e. religion. Similarly, maternal factor PPROM was found significantly associated (p value = 0.011) with birth weight of baby at p value <0.05. Similar study was conducted by Zohreh Mahmoodi, M.Sc. et al (2012) which revealed the incidence of PTB to be 27.9% and PROM to be 34.7%. Significant relation was found between maternal age and PROM, p<0.001. PROM was related to PTB significantly (p=0.040). [11]

CONCLUSION

The study was undertaken to identify the maternal factors associated with preterm birth. The study results revealed that 37.3% (38) of the mothers were having antepartum hemorrhage, 22.5% (23) were having PPROM, 17.6% (18) had abortion history, 16.7% (17) had oligohydramnios, and 13.7% (14) were having pregnancy induced hypertension as factor for preterm birth. Maternal factors found significantly associated with preterm birth were PPROM (F =5.659, p-value=0.001), Twins (F =6.567, p-value=0.000) and Underwent ART (F=2.223, p-value=0.050). Association of maternal factors such as diabetes (p value = 0.000), hypothyroidism (p value = 0.000), drugs before pregnancy (p value = 0.000) and still birth (p value = 0.001) were found

significantly associated with socio-demographic variable i.e. religion. Similarly, maternal factor PPROM was found significantly associated (p value = 0.011) with birth weight of baby at p value <0.05.

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Conflict of interest: The authors have no conflict of interest to declare.

REFERENCES

1. Dutta Parul. Pediatric Nursing. 2nd ed. New Delhi: Jaypee Brothers; 2009.
2. Lumley J. Defining the problem: The epidemiology of preterm birth. BJOG. 2003;110 (suppl 20):3-7.
3. Wen SW, Smith G, Yang Q, Walker N. The epidemiology of preterm birth and neonatal outcome. *Semin Fetal Neonatal Med.* 2004;9(6)**:**429-35.
4. Jacobsson B, Ladfors L, Milsom I. Advanced maternal age and adverse prenatal outcome. Obstet Gynecol 2004; 104(4):727-33.
5. WHO Report 2014. Cited on 2014 Nov. Available from: http://www.who.int/mediacentre/factsheets/fs363/en
6. Bangalore Report 2013. Cited on 2013 Nov. 6. Available from: http://timesofindia.indiatimes.com/city/bengaluru/Preterm-births-21-and-rising/articleshow/25843826.cms
7. CDC Report 2014. Cited on 2014 Dec. 23. Available from: http://www.cdc.gov/reproductivehealth/maternalinfanthealth/pretermbirth.htm
8. Pinborg A, Ortoft G, Loft A, Rasmussen SC, Ingerslev HJ. Cervical conization doubles the risk of preterm and very preterm birth in assisted reproductive technology twin pregnancies. Hum Reprod. 2015, Jan;30(1):197-204. Available from: http://www.ncbi.nlm.nih.gov/pubmed/25358346
9. Patel M, Thakkar J, Munjal J. Pandya. Low birth weight and intrauterine growth retardation in relation to pregnancy induced hypertension – A retrospective study. Gujarat medical journal. 2012;67(2):17-21. Available from: http://medind.nic.in/gaa/t12/i2/gaat12i2p17.pdf
10. Dey M, Agarwal R, Maji D, Kohli U. Maternal and fetal factors observed with late preterm births. Int J Res Med Sci. 2015;3(8):1969-73. Available from: http://www.scopemed.org/fulltextpdf.php?mno=190577
11. Mahmoodi Z, Hoseini F, Shahr H, Ghodsi z, Amini L. The Association between Maternal Factors and Preterm Birth and Premature Rupture of Membranes. Journal of Family and Reproductive Health.2010;4(3):135-39. Available from: http://www.sid.ir/en/VEWSSID/J_pdf/1001420100307.pdf

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