Preterm Birth - Its Etiology and Outcome

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Abstract

This Is a retrospective case control study. Out of a total of 1238 births occurring over a period of 8 months at the Ago Khan University Medical Centre, Karachi, 9.4% were preterm. Factors found to be associated with preterm labour were age >35, height <156 cm, anaemia or urinary tract Infection In pregnancy, abruptio placentae, polyhydramnios, preterm rupture of membranes, Intrauterine growth retardation, fetal distress and intrauterine death. Previous bad obstetric history was also relevant. A preterm baby was found to be at higher risk of postnatal complications resulting in neonatal death or admission to the Neonatal Intensive Care Unit (NICU) than a full term baby (JPMA:68, 1994).

Introduction

The prevalence of preterm labour (delivering before 37 completed weeks of gestation[1]) varies in different parts of the world[2]. It is one of the major contributors to perinatal mortality and morbidity in the West[3]. Crucial data on this important topic is not available in parts of the developing world and particularly in Pakistan. A community based study (unpublished) in Karachi indicates a prevalence of preterm labour of 9.1% in five "katchi abadis" (urban squatter settlements). The present study looks at the prevalence of the condition and is an attempt to identify risk factors for preterm labour in an obstetric population of predominantly middle to high socio-economic class. The perinatal outcome of the study population is presented and compared with a control group.

Design, Description and Methodology

This study was conducted at the Aga Khan University Hospital (AKUH), a tertiary care centre of Karachi dealing with a predominantly upper middle and high socio-economic class. Ninety percent of women delivering here are "booked" cases. This is a retrospective case-control study in which controls are double the number of cases (controls are chosen in a ratio of 1:2 set according to the standard statistical tables). From births occurring between 1st July, 1990 to 30th February, 1991, all spontaneous pretermlabours (of less than 37 weeks of gestation) were picked and designated as preterm birth (PTB). One hundred and sixteen such cases were found in this time period. The controls were selected by stratified random sampling. Every 5th full term delivery during the same time span was taken as control. A total of 232 controls were enrolled in this way. The health of newborn was traced all the way from labour room to Well Baby Nursery or NICU (Neonatal Intensive Care Unit) until discharge from hospital. For each group of women - cases and controls, the presence or absence of the following factors was noted. Maternal age <20 and >35, height <156 cm, anaemia (Hb< 10gm% at booking), hypertension in pregnancy (both pre-eclampsia and chronic hypertension), urinary tract infection (UTI) proven on culture, diabetes in pregnancy, rhesus negative mother, abruptio placentae and placenta previa, polyhydramnios, uterine malformation (including fibroids), multiple pregnancy, PROM (preterm rupture of membranes) and previous history of abortion or preterm labour. The sex of the baby, the occurrence of for et al distress and perinatal outcome were noted. The ChiSquare test (X^2) was applied for data analysis. A p value of <0.05 was taken to denote significance.

Results

From July, 1990 to February, 1991, 1238 births took place at AKUH out of which 116 (9.4%) were preterm births. The results are depicted in table Ito V. Age >35 and height <156 cms predisposes women to the risk of preterm birth (Table I). Maternal medical disorders during the antenatal period contributing to PTB (Table II) are anaemia and urinary tract infection whereas the obstetric risk factors (Table III) predisposing to the disorder are abruptio placentae, polyphydramnios and preterm rupture of membranes. The relevant aspects of past obstetric history (Table IV) are previous abortion (one or more) and previous caesarean section. There is a statistically significant relationship of frequency of intra-uterine growth retardation, intra uterine death and for et al distress with preterm labour (Table V). A large percentage of preterm babies were shifted to NICU as a result of postnatal life threatening complications. Similarly neonatal mortality was significantly high in preterms in contrast to 100% full terms who were alive by the end of the one week post birth.

Table I. General maternal risk factors.

	Cases (n = 100)	Controls (n = 200)	x^2	O.R.	P value
<21 years	11 (9.48%)	15 (6.46%)	N.S.	1.52	>0.05
>35 years	10 (8.62%)	3 (1.3%)	11.55	7.8	<0.001
Ht. <156 cm	15 (12.9%)	7 (3%)	12.83	4.77	<0.001
Primigravida	39 (33.6%)	60 (25.8%)	N.S.	1.49	>0.05
Multigravida	12 (10.34%)	14 (6.03%)	N.S.	1.8	>0.05
Rh. negativity	10 (8.6%)	11 (4.74%)	N.S.	1.9	>0.05

N.S. = Not significant

Maternal medical disorders during the antenatal period contributing to PTB (Table II)

Table II. Maternal medical disorders.

	Cases (n = 100)	Controls (n = 200)	x^2	O.R.	P value
Anaemia	38 (32.7%)	14 (6%)	43.45	7.59	<0.001
U.T.I.	14 (12%)	5 (2.15%)	14.73	6.23	<0.001
Hypertension	14 (12%)	18 (7.75%)	N.S.	1.63	>0.05
Diabetes	15 (12.9%)	16 (6.89%)	N.S.	2.0	>0.05

N.S. = Not significant

are anaemia and urinary tract infection whereas the obstetric risk factors (Table III)

Table III. Obstetric risk factors.

	Cases (n=100)	Controls (n=200)	x^2	O.R.	P value
Abruptio placentae	8 (6.9%)	2 (0.86%)	10.09	8.52	<0.01
Placenta previa	1 (0.86%)	1 (0.43%)	N.S.	2.01	>0.05
Polyhydramnios	4 (3.44%)	0	8.09	U.D.	<0.01
Multiple pregnancy	3 (2.58%)	3 (1.3%)	N.S.	2.03	>0.05
Uterine malformation	3 (2.58%)	3 (1.3%)	N.S.	2.03	>0.05
PROM	22 (18.96%)	0	46.0	U.D.	<0.001

N.S. = Not significant
U.D. = Undefined

predisposing to the disorder are abruptio placentae, polyphydramnios and preterm rupture of membranes. The relevant aspects of past obstetric history (Table IV)

Table IV. Previous obstetric history.

	Cases (n=100)	Controls (n=200)	x^2	O.R.	P value
Preterm	1 (0.86%)	4 (1.72%)	N.S.*	0.5	>0.05
Abortion	27 (23.2%)	17 (7.3%)	17.81	3.84	<0.001
Previous LSCS	5 (4.3%)	26 (11.2%)	4.53	0.36	<0.05

*N.S. = Not significant

are previous abortion (one or more) and previous caesarean section. There is a statistically significant relationship of frequency of intra-uterine growth retardation, intra uterine death and for et al distress with preterm labour (Table V).

Table V. Foetal/perinatal aspects.

	Cases (n=100)	Controls (n=200)	x^2	O.R.	P value
IUGR	18 (15.57%)	3 (1.29%)	27.59	14.02	<0.001
IUD	9 (7.7%)	1 (0.43%)	14.88	19.43	<0.001
Foetal distress	14 (12%)	10 (4.3%)	7.25	3.05	<0.01
Male baby	60 (51.7%)	102 (44%)	N.S.*	1.36	>0.05
Female baby	61 (52.6%)	130 (56%)	N.S.*	0.07	>0.05
NICU required	31 (26.7%)	9 (3.87%)	39.67	9.04	<0.001
Neonatal death	8 (6.9%)	0	16.38	U.D.	<0.001

*N.S. = Not significant
U.D. = Undefined

A large percentage of preterm babies were shifted to NICU as a result of postnatal life threatening

complications. Similarly neonatal mortality was significantly high in preterms in contrast to 100% full terms who were alive by the end of the one week post birth.

Discussion

The majority of hospitals in Pakistan deal with an 'un booked' obstetric population where gestational age at delivery is often not certain. This study was performed at the AKUH, a centre where 90% of the obstetric population are 'booked' antenatal cases. Gestational age is therefore confirmed by routine early ultrasound scan. The prevalence of preterm birth in the study population was 9.4% which is comparable with the West[5]. Studies quote extremes of age in the aetiology of PTB[5,6] and our study highlights this relationship with regard to the age >35 group. Also relevant is a relationship between heig4it <156 cms and preterm labour. Controversial data[5,7] on the relevance of gravidity is available and is seen not to be a factor in our study. It has been indicated earlier[8-10] and confirmed by this analysis that antenatal anaemia and urinary tract infection strongly predispose to preterm labour. This is particularly relevant in Pakistan where anaemia has a high prevalence[11]. However, diabetes, hypertension in pregnancy and multiple pregnancy sometimes said to be risk factors for the condition[5] do not stand out as such in this analysis. Abruptio placentae, polyhydramnios and preterm rupture of membranes are risk factors for PTB in this analysis and as shown previously[12,13]. Tucker et al[12] found a definite relationship of PTB with intrauterine death (IUD), intrauterine growth retardation (IUGR) and for et al distress and this is borne out in this study. This analysis, unlike Hall and Carr Hill\'s[14]. failed to prove that a male baby and PTB are interrelated. Neonatal outcome in terms of 'transfer to NICU' and \'perinatal death' is grave and valid in case of PTB[12] and our study further strengthens this fact. Keeping all these points in view it should be accepted that identification of the high risk group is the most crucial step in the prevention of PTB. This includes women who are over 35, short women, the anaemic, those who have UTI in pregnancy and those with previous abortions and caesarean sections. Correction of the risk factor, e.g., anaemia or UTI should be useful. Complications of prematurity account for much neonatal morbidity and mortality and besides prevention, attention to the care of the PTB (preterm baby) is necessary).

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