# FACTORS DETERMINING THE CONSEQUENCES OF PREMATURITY IN A TEACHING HOSPITAL

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## Abstract

***Objectives:*** *To determine the frequency of premature births and factors leading to prematurity in the neonatology unit of Khyber teaching hospital Peshawar.*

***Materials & Methods:*** *A cross-sectional descriptive study was conducted in the neonatology unit of Khyber Teaching Hospital Peshawar from 1st January 2016 to 31 Dec 2016. Congenitally malformed babies were excluded and those babies with a gestational age of 24 to 37 completed weeks were included in the study. Data were analysed using SPSS version 20.0.*

***Results:*** *Out of 4000 babies, 1200 (30%) were premature. 749 (62.4%), of mothers having premature babies, were in age group of 20-30 years, multiparous 872 (72.4%), 1094 (91.14%) of them were healthy having no medical problems, 642 (53.5%) of them have consensual marriages. 465 (38.77%) of the babies had a gestational age of 34-36 weeks, and 521 (43.38%) had birth weight 2000-2500g. The most frequent complication associated with these premature babies was respiratory distress affecting about 645 (53.74%).*

***Conclusion:*** *Risk factors for premature babies were young mothers, those suffering from any systemic disease, consensual marriages, or previous history of premature births.*

***Key Words:*** *Premature birth, Small for age, consanguinity, Complications, gestational age, low birth weight*

## Introduction

According to WHO, any birth that occurs before 37 weeks is considered premature birth (PMB)[1]. Normally a delivery date is estimated 280 days after last menstrual period but only 4% delivered at 280 days while 70% delivered within ten days of estimated date of delivery[2]. The chance of survival in babies born at fewer than 23 weeks is 0%, at 23 weeks 15%, at 24 weeks 55% and at 25 weeks 80%[3].

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The global estimate of preterm births is 11.1 per cent[4]. Every year 15 million babies (5 to 18%) are born too early making it, the leading cause of death in children under the age of 5 years and also a major reason for morbidity and childhood disabilities[4,5]. Despite major preventive measure, premature births are on the rise globally[5]. 12% of babies are born premature in developing countries as compared to 9% in developed countries. In developing countries, fifty per cent of the babies born at or below 32 weeks die due to a lack of affordable and cost-effective care, such as prevention of hypothermia, early initiation and maintenance of breastfeeding support, and basic care for infections and breathing difficulties. Also, lack of technology, lack of awareness of general

danger signs causes an increased burden of disability among preterm babies who survive the neonatal period.

Within countries, families with low income are at higher risk[6] In the United States where most of the infections and other causes of neonatal death have been markedly reduced, but still, prematurity is the leading cause of neonatal mortality, i.e. 25% of babies die on the first day[14]. Pakistan is ranked 4th with 78,000 per annum of PMB registration, [7]. While percentage-wise Pakistan is listed on the eighth position with the annual average of 15.8 per cent preterm births[6].

Reasons of prematurity consist of a complex phenomenon, which comprises fetal, placental, and maternal factors. Premature infants whose low birth weight is appropriate for their preterm gestational age is mostly resulting of certain conditions characterized by a uterine inability to retain fetus like premature rupture of amniotic membranes or premature separation of the placenta, multiple gestations, or uterine contraction of unknown origin before term[8,9].

As 75% of premature births analysis shows no reason but several etiological risk factors have been identified. Non-obstetric risk factors include low income, maternal malnutrition, illiteracy, anaemia, maternal age less than 20 years and more the 35 years, heavy manual work, obstetric history, present pregnancy, cigarette smoking and trauma, especially to the abdomen. Obstetric risk factors associated with premature births include uterine malformations, placenta previa, abruption placenta, cervical incompetence, multiple parities, short birth intervals, abortion, male to female ratio of premature neonates, pre-labour premature rupture of membrane and previous positive preterm birth history[10].

Low birth weight LBW (birth weight of 2500g or less) is a consequence of prematurity, intrauterine growth restriction(IUGR) or both[12]. A strong positive correlation exists between both preterm birth and low socioeconomic status[13]. The increase in mortality and morbidity is associated with a decrease in gestational age hence with low birth weight. Moreover, the rate of premature babies has increased in Pakistan probably because of an increase in early marriages, multiple pregnancies, poor maternal health, and consensual marriages[15].

As large number of premature babies born to consensual couples, and mothers having a positive history of premature births and suffering from various systemic diseases give birth to premature babies. The objective of the study was to assess the frequency and factors leading to prematurity in neonatology unit of Khyber teaching hospital Peshawar.

## Materials and Methods

A cross-sectional descriptive record-based study was conducted in the neonatology unit of Khyber Teaching Hospital. All the premature babies admitted in the neonatology unit of Khyber Teaching Hospital Peshawar from 1st January 2016 to 31st December 2016 were studied from the previous admission records.

Previous records of those babies having a gestational age of 24 to 37 complete weeks were included while all those babies with congenital malformation were excluded from the study.

Various factors leading to prematurity and complications associated with prematurity were studied. The questionnaire, contained close-ended questions with yes and no options, regarding place of delivery (home, private clinics, hospital), gestational age ( number of weeks), birth weight (grams) gender of the baby, mode of delivery (normal vaginal, instrumental, c-section), consanguinity, parity (primiparous, multiparous), mother age (years), any medical illness (diabetes, hypertension), history of previous premature births, and outcomes of preterm birth (number of babies discharge, expired, discharge on their own will (DOW), left against medical advice (LAMA)).

Data were collected retrospectively through a review of hospital record. The collected data was analyzed in MS office Excel 2007. Results were presented in the form of tables and bar charts.

## Results

Almost 4000 babies admitted in the neonatology unit of Khyber Teaching Hospital in 2016. Out of which 1200 were found premature (gestational age below 37 complete weeks of gestation).

About n:780 (65.02%) premature births were taken place in hospitals, n:207 (17.6%) premature babies were born in homes and n:213 (17.68%) were born in private clinics.

Babies having gestational age 24-28 weeks (ex-

treme premature) accounts n:76 out of 1200 (6.29%), while those born at 29-32 weeks of gestation ( severe premature) accounts n:314 (26.14%) and those having gestational age of 33-34 weeks (moderately severe premature) accounts n:345 (28.74 %) and those having gestational age of 35-36 weeks (late premature ) accounts n:465 (38.77%).

Hospital record showed that n:41(3.416%) out of 1200 premature babies were having birth weight below 1000g, about n:291 (24.29%) were having birth weight of 1001-1500g, about n:347 (28.91 %) babies were having birth weight of 1501-2000g and n:521 (43.38%) premature babies were having birth weight of 2001-2500g.

Gender wise distribution of premature births, n:650 (54.16%) were males and n:550(45.84). were female Great number of preterm birth, i.e. n:976 (81.3%) were delivered through normal vaginal delivery while n:24 (1.96%) were born through assisted delivery and about n:200 were born through cesarean section.

Consensual marriages were observed in n:642 (53.5%)of cases.

Multiparous accounted n:872(72.7%) and about n:328(27.36%) were primiparous, i.e. it was their first baby.

Age wise distribution of mothers having premature babies was as follow out of 1200 mothers n:749 (62.7%) mothers have age between 20-30 years. N:305(25.5%) were below 20 years and n:142 (11.8%) were above 30 years.

Distribution of mothers, on the basis, whether they have any previous medical history of any disease or not, n:1094 (91.14%) were found healthy having no clinical problems. About n:82 mothers (6.9%) were hypertensive and about n:24 mothers (1.96%) had diabetes.

Previous premature delivery history was positive in the only n:450 (37.55%) See Fig 1.

Out of 1200 premature babies n:788 (65.68%) were discharged, n:317 (26.4%) were expired, about n:50 (4.14%) discharged on their own well (DOW) and about n:45 (3.74%) left against medical advice (LAMA).

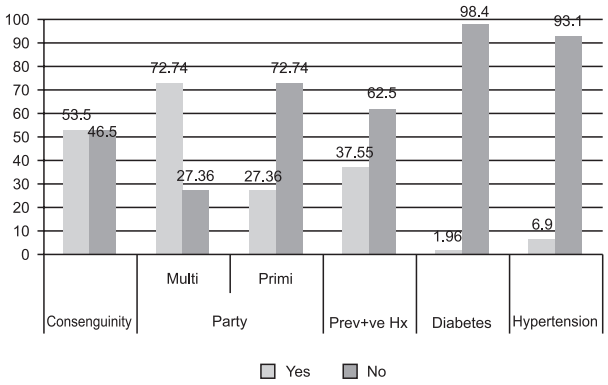


**Fig: 1 Frequency of prematurity in various obstetrical and non-obstetrical conditions**

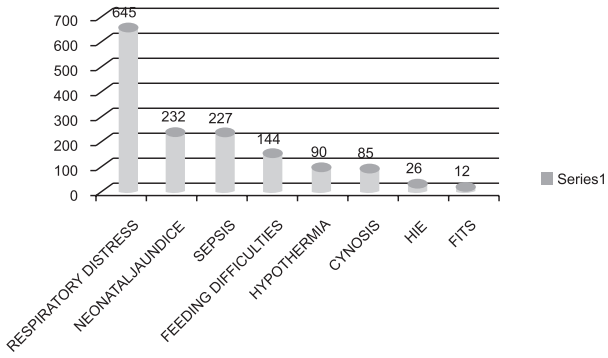


**Fig: 2 Distribution According to Complication of Prematurity**

## Discussion

Although Pakistan ranked 4th, with 18.5% in premature births[17]. But in our study, which was conducted in Khyber Teaching Hospital, a tertiary care hospital in Peshawar, the frequency was 30% in the neonatology ward, where babies were admitted for the different clinical problem. This increase in hospital admission for prematurity is because of technological advancements and widespread use of steroids, mechanical ventilation and improve antenatal care. The other reason may be the gender of the babies, as due culture reason in case of male child parents tends to seek medical advice for their male babies as compared to females. This Sequelae of prematurity can be reduced to some extent by using drugs to accelerate maturation of the fetus[18] and provision of comprehensive emergency obstetrical care at the primary health care facilities to a greater extent by preventing preterm birth.

In our study for risk evaluation, the age of the mother was found to have some effect on preterm birth which was between 20-30 years in 62.7% of the mothers. This may be indicative of unfavourable socio-economic situations[19] as women at this age

group are under a lot of social, economic and cultural pressure to produce a male child which make them more vulnerable for preterm births. In some studies, advanced maternal age is related to premature births[19] which is contradictory to our study. Therefore, we recommend the early initiation of prenatal care, especially among adolescents, the most vulnerable group.

In our observation, consensual marriages came out as another risk factor. Consensual marriages constituted 53.5% of premature births in our study. Consanguinity is a greater risk for developing various hereditary complications mainly due to genetic disorders. Congenital anomalies are present in approximately 3-7% of infants[20].

Increase incidence was also observed in multiparous (72.7%) as compared to primiparous. Although, some studies didn't find any association between parity and premature births. But some studies have found an association between multiple gestations and preterm births[21]. The reason could be anaemia in mothers or malnutrition associated with increased parity. In some studies, Women whose first births were delivered before term were considered at increased risk for recurrent preterm delivery. In our study, about 450 (37.5%) mothers encountered previous premature births making it a risk factor for preterm births[9]. Premature births associated with mother medical illness seem to be affected more by hypertensive disorders as seen in our study. Other studies also mention the possible association of prematurity with hypertension and diabetes[22]. Renzo *et al.* reported 2.6 times greater risk of preterm birth among women with chronic hypertension[23] which is in accordance with our study. In this regard, hypertension was seemed to contribute more to preterm births as compared to diabetes, i.e. 1.96% of our study population mothers were diabetic while 6.9% were hypertensive. Improving maternal hypertension, through proper and timely diagnosis and treatment will improve placental perfusion and so will fetal outcomes.

In our study, 65.2% of preterm births took place in a hospital and 7.68% in private clinics, which altogether form about 72.9% of all the score. Male babies account for about 650(54.16%) while female accounts 550 (45.84%) showing an association between the gender of the babies. Usually, prematurity is high among males than females, and also there are better outcomes in females premature infants this association is also documented in certain other studies where increase prevalence of prematurity is noted in male babies[20].

Neonatal mortality is inversely related to gestational age and birth weight. If both of them are large, then neonatal mortality will be reduced, and if small then there are increased chances of mortality. Many countries show an increase in the premature babies possibly due to improved methods of measurement. The chance of survival is different depending on the gestational age, birth weight, and availability of neonatal care facilities. Neonatal mortality is very high among the very extreme premature babies (24-28 weeks of gestational age) in developing countries, but accounts for only 10% in developed countries[24].

The percentage of our study population according to gestational age were 24-28 weeks (extremely premature) 6.29%, while 29-32 weeks of gestation ( severe premature) 26.14% and of 33-34 weeks (moderately severe premature) accounts 28.74 %and of gestational age of 35-36 weeks (late premature ) accounts 38.77%. As 35-37 week gestational age is considered near to term making the chances of the baby to live long.

According to WHO, 2.5 g is labelled as low birth weight[25]. In our study, Hospital record showed that 41 out of 1200 premature babies (3.416%) were having birth weight below 1000g, about 291 (24.29%) were having birth weight of 1001-1500g, about 347 (28.91 %) babies were having birth weight of 1501-2000g and 521 (43.38%) premature babies were having birth weight of 2001-2500g. The increase in late prematurity was due to advances in interventional technologies in obstetrical and neonatal care. This also means that birth weight 2001-2500 g is a good indicator of child survival with an increase in the percentage of hospital admission rate. .In the developed world overall survival is about 90% while in low-income countries survival rates are about 10%[9]. A long-term study demonstrated that the risks of medical and social disabilities extend into adulthood and are higher with decreasing gestational age at birth and include cerebral palsy, intellectual disability, disorders of psychological development, behaviour, and emotion, disabilities of vision and hearing, and epilepsy. Throughout life, they are more likely to require services provided by physical thera-

pists, occupational therapists, or speech therapists[26].

The data for variables collected on the medical records of the subjects; there might be a potential risk for the quality of recorded data. Other limitations of the study were Time, Incomplete record, Finance, Resources, and Tough routine to follow up.

## Conclusion

History of preterm birth, consanguinity, multiparity, hypertension and gender of the baby were identified as the most important risk factors for preterm birth. As all the risk factors are to some extent modifiable. Therefore identifying pregnant women at the risk of preterm delivery and providing them with quality healthcare may decrease the rate of preterm birth and its consequences

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