



**ORIGINAL RESEARCH PAPER**

**Paediatrics**

**A STUDY OF CLINICAL PROFILE AND OUTCOME OF PRETERM BABIES AND ASSOCIATED ANTENATAL RISK FACTORS**

**KEY WORDS:** Respiratory distress, hyperbilirubinemia, late preterm

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**ABSTRACT**

The present study was a prospective analysis of neonatal outcome (mortality and morbidity) of preterm babies and analysis of antenatal risk factors of the mothers of the preterm babies. All preterm babies born between 28 weeks to 36 weeks + 6 days were included in the study. Sample size was taken as 200. Preterm babies born in labour ward and operation theatres between 28 weeks to 36 weeks + 6 days delivered were taken into study. The incidence of preterm birth in this study is 7.4%. Most of the babies in this study are in the late preterm group (61%). Among 200 babies, the most common morbidity is icterus (79.5%). Pregnancy induced hypertension, anaemia, urinary tract infection are the major maternal risk factors for preterm birth. There is association with previous history of preterm births and abortions. Respiratory distress and sepsis are the major causes of mortality in this study.

**I. INTRODUCTION:**

The World Health Organization (WHO) defines preterm birth as any live birth before 37 completed weeks of gestation or fewer than 259 days since the first day of woman's last menstrual period (LMP)<sup>1</sup>. Preterm birth (PTB) is the leading cause of infant morbidity and mortality in the world. Based on data from 184 countries, the global average preterm birth rate in 2010 was 11.1%. Preterm birth rates varied widely between countries. At the national level, the estimated preterm birth rate ranged from about 5% to 18%. The highest rates of preterm birth were in south-eastern Asia and sub-Saharan Africa (13.5% and 12.3% of all live births, respectively). Studies revealed incidence to be higher in developing countries than in developed countries<sup>2</sup>. Incidence of preterm birth in India is around 21%. Complications of preterm birth are the single largest direct cause of neonatal deaths, responsible for 35% of the world's 3.1 million deaths a year, and the second most common cause of under-5 deaths constituting 18%, after pneumonia which contributes to 24% of deaths. In almost all high- and middle-income countries of the world, preterm birth is the leading cause of child death<sup>4</sup>. Being born preterm also increases a baby's risk of dying due to other causes, especially from neonatal infections with preterm birth estimated to be a risk factor in at least 50% of all neonatal deaths. Defining risk factors for prediction of preterm birth is a reasonable goal for several reasons. The identification of modifiable causal factors is an essential first step in any primary prevention programme. First, identification of at-risk women allows initiation of risk-specific treatment. Second, the risk factors might define a population useful for studying specific interventions. Finally, identification of risk factors might provide important insights into mechanisms leading to preterm birth. Addressing preterm birth is essential for accelerating progress towards Millennium Development Goal 4 (MDG4)<sup>5,6</sup>. In addition to its significant contribution to mortality, the effect of preterm birth amongst some survivors may continue throughout life, impairing neurodevelopmental functioning through increasing the risk of cerebral palsy, learning impairment,

visual disorders and affecting long-term physical health with a higher risk of non-communicable diseases<sup>7</sup>. These effects exert a heavy burden on families, society and the health systems<sup>3, 8</sup>. Hence, preterm birth is one of the largest single conditions in the Global Burden of Disease analysis responsible for high mortality and also has considerable risk of lifelong impairment<sup>9</sup>. However during the last two decades, the survival of the premature infants has significantly increased due to advances in perinatal and neonatal treatment expertise and improvement in the care of high risk mother. The survival rate has increased from 10% to 50-60%<sup>10</sup>. It is a time felt need to ascertain maternal antenatal factors contributing to preterm birth and need for improvement of perinatal care to increase the neonatal survival. Hence, this prospective study of the maternal risks factors, clinical profile and outcome of preterm babies till discharge.

**II. METHODOLOGY**

Preterm babies born in labour ward and operation theatres between 28 weeks to 36 weeks + 6 days delivered were taken into study. Gestational age was calculated from mothers LMP and new Ballard score. Babies were weighed using electronic weighing machine with standard error of ± 50 grams. Babies were categorized into SGA (<10th percentile), AGA (10-90th percentile), LGA (>90th percentile) by plotting on a chart based on Indian standards common for both the sexes. Babies were analysed for morbidity patterns, mortality of babies and its causes. Detailed maternal history was taken and maternal records were referred for further evaluation of maternal risk factors.

**Inclusion Criteria:**

- Preterm babies born between 28 weeks to 36 weeks + 6 days
- Preterm babies with birth weight – SGA (small for gestational age), AGA (appropriate for gestational age), LGA (large for gestational age)

**Exclusion Criteria:**

Preterm babies who were stillborn

### III. Statistical Analysis

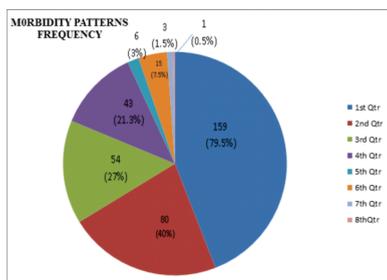
Data were analysed using the SPSS software package, version 17.0 (SPSS Inc., Chicago, Illinois, USA). A 'p' value less than 0.05 denotes significant relationship. A 'p' value more than 0.05 denotes absence of relationship between the two variables, hence not significant.

### IV. Ethical Concern

Ethical clearance was obtained from the Ethical committee meeting conducted at Meenakshi Medical College and Research Institute, Kanchipuram, Tamil Nadu, India.

### V. RESULTS

The incidence of preterm birth in this study is 7.4% with a male preponderance of 61.5% and girls (38.5%). Most of the babies in this study are in the late preterm group (61%). 66% of babies are appropriate for gestational age and 28.5% of babies are in the SGA group. The most common morbidity in this study is found to be hyperbilirubinemia (79.5%), respiratory distress accounted for 40% of babies, sepsis in 27% of babies, metabolic abnormalities (21.5%). 62.5% of babies are delivered electively through L.S.C.S. Respiratory distress as seen in most cases in this study could be accounted for more number of caesarean births as the late preterm have pulmonary immaturity and lack the beneficial effects of normal labour when compared to term counterparts.



The major cause of mortality in this study is due to respiratory distress and sepsis. About 68% of babies required NICU admission increasing the length of stay in the hospital because of clinical morbidities like icterus and respiratory distress and sepsis. Mothers enrolled in this study are in the reproductive age group (59%) with the mean age group being 25.3 years. 95% of mothers received antenatal care. Most of the women enrolled in the study belong to socioeconomic class III and IV. About 62% had a weight gain between 6 to 12 kg which could be attributed to regular antenatal care received by the mothers. SGA babies are seen in the mothers who had inadequate weight gain during pregnancy denoting there is a direct relationship between maternal weight gain and gestational weight of the babies. The most common maternal medical illness in this study are PIH (41%), anaemia (24%), diabetes (15.5%), UTI (22%). SGA babies are seen born to the mothers with anaemia and PIH, the reasons could be inadequate supply of nutrients and oxygen to the developing foetus in case of anaemia and uterine placental insufficiency leading to IUGR and SGA babies in case of PIH respectively. 9% of cases had a history of prior preterm delivery. 8.5% of cases had a prior bad obstetric history. The causes of preterm birth are a complex interplay of biological, socioeconomic and environmental factors that contribute to women's risk of delivering a preterm baby. Medical conditions like hypertension during pregnancy, anaemia, infection, prior history of preterm birth, prior bad obstetric history are other factors that can contribute to preterm delivery. Most of the factors are modifiable with adequate antenatal care and educating the mothers as any significant gains could be obtained in this area of preterm birth is by prevention.

### CONCLUSION

Incidence of preterm delivery in this study is 7.4%. AGA

babies born are more when compared to SGA and LGA babies. Babies born in advanced gestational ages (late preterm) are more when compared to lower gestational ages. Incidence of male babies is more compared to female babies. Neonatal hyperbilirubinemia, respiratory distress, metabolic abnormalities are the common neonatal morbidities.

Better socio-economic status of the mothers, antenatal care of the mothers, maternal weight gain of the mothers during pregnancy, age of the mother has influences over the birth weight of the babies. Pregnancy induced hypertension, anaemia, urinary tract infection are the major maternal risk factors for preterm birth. There is association with previous history of preterm births and abortions.

The various clinical morbidities like icterus, respiratory distress, sepsis has an impact over the outcome in the late preterm babies as seen in this study, as these conditions increased the length of stay in hospital requiring NICU admission. Respiratory distress and sepsis are the major causes of mortality in this study. Some of these risk factors are remediable if adequate antenatal care and timely intervention are done.

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