Maternal Factors in Preterm Babies Requiring Intensive Care in a Tertiary Care Center in Navi Mumbai

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Abstract: *In a study done at NICU of MGM Hospital Kalamboli Navi Mumbai, maternal factors were studied in 100 preterm babies admitted in the NICU from August 2020 to August 2022. Risk factors and antenatal complications were evaluated. Mothers of 15 babies did not have any identifiable antenatal problems. In 34 babies the mothers had at least 1 condition known to affect the baby and mothers of 50 babies had more than one medical condition. 14% of the mothers had diabetes/ gestational diabetes mellitus, 25% had hypertension/ Pregnancy induced hypertension, 11% had preeclampsia, 42% had preterm premature rupture of membrane, and 42% received antenatal steroids, 10% had miscellaneous conditions such as placenta previa, hypothyroidism, cervical incompetence, invitro fertilization and anemia. 52% belong to lower middle class (III) and 41% belong to upper lower class (IV) according to the modified kuppuswamy scale 2020.*

Keywords: Preterm birth, prematurity, maternal complications, antenatal factors, india, NICU

1. Introduction

Preterm birth (premature birth) is a significant public health problem across the world because of associated neonatal (first 28 days of life) mortality and short-and long-term morbidity and disability in later life. Complications of preterm birth are the leading cause of death among children under 5 years of age.

2. Aim and objectives

To study the maternal factors associated with preterm births requiring NICU care.

3. Material and Methods

Place of study: NICU**,** MGM institute of health sciences, Kalamboli, Navi Mumbai.

Duration: Two years

Study design: Descriptive observational study

4. Results

The maternal factors were studied in 100 preterm babies admitted in the NICU from August 2020 to August 2022. Mothers of 15 babies did not have any identifiable antenatal problems. In 34 babies the mothers had at least 1 condition known to affect the baby and mothers of 50 babies had more than one medical condition.14% of the mothers had diabetes/gestational diabetes mellitus, 25% had hypertension/Pregnancy induced hypertension, 11% had pre-eclampsia, 42% had preterm premature rupture of membrane, and 42% received antenatal steroids, 10% had miscellaneous conditions such as placenta previa, hypothyroidism, cervical incompetence, invitro fertilization and anemia.52% belong to lower middle class (III) and 41% belong to upper lower class (IV) according to the modified kuppuswamy scale 2020.
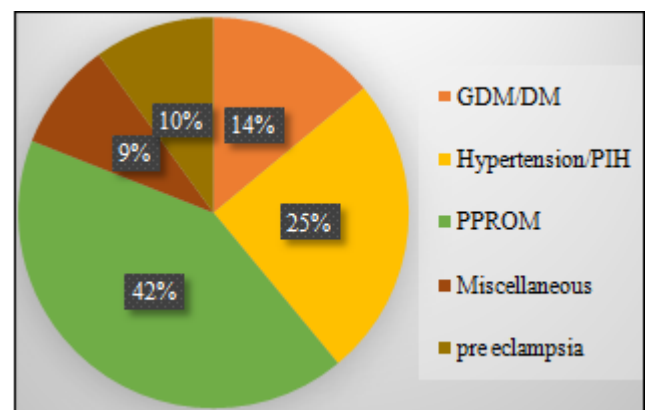
Figures

Figure A: Antenatal complications in pregnant females with premature delivery
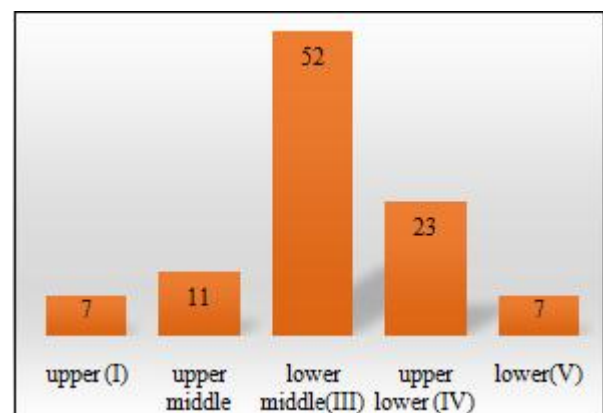

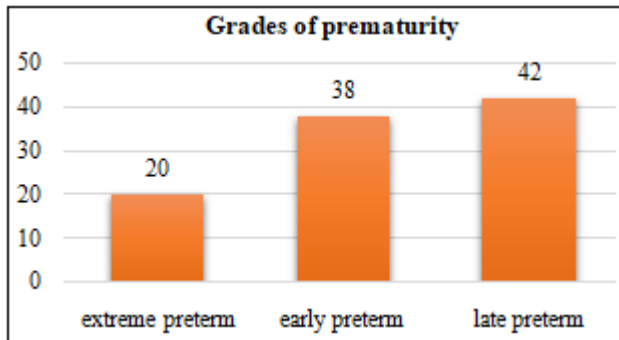**Figure B:** Socio-Economic Distribution

Figure C: Grades of Prematurity

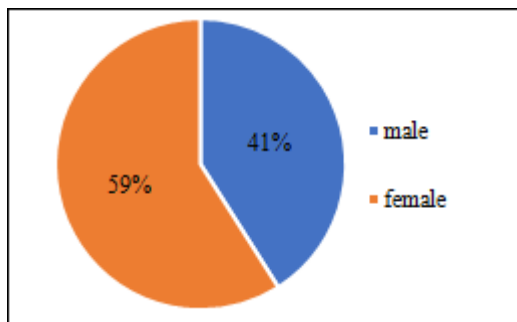**Figure D:** Distribution of fetal sex

5. Discussion

Preterm birth (premature birth) is a significant public health problem across the world because of associated neonatal (first 28 days of life) mortality and short-and long-term morbidity and disability in later life. Preterm is defined by World Health Organization (WHO) as babies born alive before 37 completed weeks of gestation or less than 259 days of gestation since the first day of a woman's last menstrual period (LMP).

Preterm birth is a crucial global health issue, which must be addressed to reduce neonatal and child mortality globally and reach the Sustainable Development Goals

Etiology of Pre-term:

Etiology is unknown in most cases. Preterm and/or LBW delivery is associated with the following conditions;

1) **Low socioeconomic status**[1]There are major variations in preterm birth rates by geographic region and level of income of a country. When countries are grouped by their World Bank income categories, it is found that approximately 90% of all preterm births occur in low- and middle-income countries. The average preterm birth rate for low-income countries is close to 12%, compared to 9.4% and 9.3% for middle- and high-income countries, respectively. [2]A multi-country systematic review of 106 observational studies done by Saifon Chawanpaiboon et al on the Global, regional, and national estimates of levels of preterm birth in 2014 revealed that low socioeconomic status relates to adverse outcomes, such as preterm and low birth weight.

2) **Maternal age:** Women younger than16 or older than 35yearsare more likely to deliver preterm or LBW infants. Extreme of maternal age is an established risk factor for preterm delivery. [3]In a case control study done by Ming Jiang et al it was found that young and advanced maternal age, were associated with preterm birth risk overall. Women who were < 20 years old had 6.63 fold increased risk of preterm births as compared to those who were 25-29 years old. Advanced maternal age was associated with a 4.47-fold increased risk of preterm birth.

3) **Non-hispanic black women** are more than three times as likely to deliver an extremely preterm infant

4) **Maternal activity** requiring long periods of standing or substantial amounts of physical stress may be associated with IUGR and preterm birth. [4]In a case control study conducted by Kittikhun Tanpradit et al it was found that maternal perceived stress during pregnancy was significantly greater in preterm birth compared with term birth. The occurrence of preterm birth was significantly correlated with prenatal perceived stress scores

5) **Acute or chronic maternal illness** is associated with early delivery. The onset of labour is either spontaneous or, not infrequently, induced.

6) **Multiple-gestation births** frequently deliver preterm (57% of twins and 93% of triplets in the United States in 2013). In such births, the higher rate of neonatal mortality is primarily due to preterm birth.

7) **Prior poor birth outcome** is the single strongest predictor of poor birth outcome. A preterm first birth is the best predictor of a second preterm birth. One preterm birth increases the risk for a second fourfold. [5]In a prospective cohort study conducted by Olugbenga et al previous history of pre-term delivery was significantly associated with pre-term delivery. This may be due to the persistence of unidentified factors in some women precipitating pre-term delivery. [6]Shingairai A Feresu et al reported that parous women with a prior history of abortion had a 1.21-fold increased risk of preterm birth when compared with parous women who did not have a history of abortion

8) **Obstetric factors** such as uterine malformations, uterine trauma, placenta previa, abruptio placentae, hypertensive disorders, preterm membranes, and chorioamnionitis also contribute to preterm birth. [7]Peter Wagura et al concluded that antenatal factors such as preeclampsia, Antepartum haemorrhage, Preterm rupture of membrane, Urinary tract infection contributed to preterm delivery

9) **Fetal conditions** such as non-reassuring testing of fetal well-being IUGR, or severe hydrops may require preterm delivery.

10) **Sex of the child:** male sex has proven greater predilection for preterm births when compared to female sex. The risk of mortality and long term morbidity is high with males

[3]Ming jiang et al observed that male babies are known to have a significantly higher risk of being preterm than female babies

[8]In a systematic analysis of preterm birth rates done between 1990-2010, It was found that preterm birth is more common in boys than girls, with about 55% of all preterm births being

boys, and is associated with a higher risk of fetal and neonatal mortality and of long-term impairment in boys than in girls born at a similar gestation

[3]In a case control study conducted by Min Giang et al in a tertiary care hospital at Yangzhou Jiangsu, China, maternal age, prior history of pregnancy and abortion, prenatal care, complications of pregnancy (includes hypertension, intrahepatic cholestasis of pregnancy (ICP), fetal growth restriction (FGR), premature rupture of the membranes (PROM), placenta previa, abnormal presentation, abnormal S/D ratio were significantly associated with preterm birth. Several factors emerged as being statistically significant risk factors for preterm birth, such as prior history of pregnancy, hypertension, ICP, FGR, PROM, placenta previa and abnormal presentation.

[9]In a descriptive cross-sectional study with data from women who gave birth in Spain during 2015 extracted from the Statistical Bulletin of birth, preterm birth rate in Spain was 6.7%. Socio-demographic factors associated with preterm births were young mothers, with level of education $\leq$ secondary studies, immigrant mothers and women living in large cities.

6. Conclusion

In this study, lower socioeconomic class and PPROM majorly contributed preterm births. High level care is required for the betterment of the outcome of mother and baby.

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