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Analysis of Risk Factors in preterm Births

KEYWORDS

Preterm birth, preterm premature rupture of membranes, perinatal mortality, preeclampsia.

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ABSTRACT

Objective *There is an increasing trend of preterm births. The present study identifies incidence and risk factors for spontaneous preterm births as well as iatrogenically induced preterm births. Their fetal outcome is evaluated.*

Material and methods *Descriptive study carried out in a span of two years. Cases of spontaneous preterm birth as well as iatrogenically induced cases are evaluated based on history, examination for risk factors and their outcome is studied.*

Results *Incidence of preterm birth during the period of study is 10.29%. Incidence was higher in age group of 20-24years (50%), low socioeconomic group (61.8%), nulliparous women (42.3%). Preterm premature rupture of membranes seen in 18% of cases. History of previous miscarriages seen in 23.6% cases and 15.9% cases had previous preterm deliveries and 9.7% cases had previous intrauterine death. Infective focus found in 38.2% cases. Iatrogenic preterm births constitute 66% of all cases of preterm birth. Perinatal mortality was 7.63%. As gestational age advances neonatal mortality reduced.*

Conclusion *The incidence of preterm births is rising mainly due to increase in the number of medically indicated preterm births. The main cause of the iatrogenic preterm birth in this study is preeclampsia. The spontaneous preterm birth rate is plateauing due to better antenatal care.*

Introduction

Preterm birth is the leading cause of neonatal morbidity and mortality worldwide. In 2010, an estimated 14·9 million babies were born preterm, 11.1% of all live births worldwide, ranging from about 5% in several European countries to 18% in some African countries. More than 60% of preterm babies were born in south Asia and sub-Saharan Africa[1]. India is the biggest contributor to the world's prematurity burden, with almost 3.6 million premature births - accounting for 23.6% of the around 15 million global pre-term births reported each year. Of these, 13% are live pre-term births[2].

Increasing incidence worldwide is attributed to the raise in multiple gestations from assisted reproductive techniques, better dating scans and iatrogenic deliveries[3]. Nowadays preterm delivery rate due to medically indicated causes is on the rise. The iatrogenic preterm delivery rate changed drastically from around 25 – 30% ten years back to 70 – 80 % most recently[5]. Preterm babies suffer not only from immediate complications of prematurity like respiratory distress syndrome, apnea etc., but also from long term neurodevelopmental disabilities, thus increasing emotional and economic burden to the families as well as to the society.

The present study is done, to identify the various risk factors for preterm births, focusing mainly on the causes leading to the rise of iatrogenic preterm births. The incidence of spontaneous preterm deliveries and various causes for Iatrogenic / medically indicated preterm labour were studied and fetal outcome is evaluated.

Materials and methods

This descriptive study is carried out from October, 2013 to September 2015 at Alluri Sitaramaraju Academy of Medical Sciences, Eluru. All the pregnant women who had preterm births were studied. Cases of preterm labour as well as iatrogenically induced cases of preterm birth were included in the study. Patients with intrauterine demise and those who haven't given consent for the study have been excluded.

Detailed history was obtained regarding age, occupation, socioeconomic status, antenatal care, stress, antenatal care, past obstetric history, any premature preterm rupture of membranes on admission. General and systemic examination was done to detect anemia, edema, jaundice, pyrexia, cardiovascular, renal and other systemic diseases. Obstetric examination and speculum examination was done to note the presence of premature rupture of membranes. An endocervical swab was taken simultaneously. Vaginal examination was done to study the cervical status, presence or absence of membranes and station of the presenting part. Sonographic evaluation was done for gestational age, well being of the fetus, number of fetuses, presentation, congenital anomalies, placental localization and for liquor amount.

All the patients were followed up until delivery. The mode of delivery and period of gestation at delivery was noted. The condition of the baby including birth weight, APGAR score and gestational age and evidence of intrauterine growth retardation or congenital anomalies was recorded. The babies were followed up till discharge and the various causes of neonatal mortality and morbidity were ascertained and the outcome of the babies with preterm birth was evaluated.

Results

The incidence of preterm births in our institution during the time period from October 2013 to September 2015 is calculated as 10.29 % (n=144). Among total (n=144) preterm deliveries, a maximum of 50% (n=72) occurred in 20-24 years age group, 23.7% (n=34) in <20yrs,15.2 % (n=22) in 25-29years age and only 11.1% (n=16) occurred in 30 – 34 yrs age group. Preterm births occurred maximum of 61.8% (n=89) in low socio-economic status, 29.9%(n=43) in middle class and remaining 8.3%(n=12) occurred in high socio-economic status. Among the 144 cases, 61.1% (n=88) were employed and 38.9% (n=56) were unemployed. Out of these 88 cases of employed women, 68 women i.e., 77.3 % had risk factor of stress. And the remaining 20 cases were stress free. And out of the 56 unemployed women, 47 women i.e., 84 % had risk factor of stress, while the remaining had no stress. Risk factor of preterm premature rupture of membranes present in 18% (n=26) cases. Among the cases, 22.2% (n=32) were booked and 77.8% (n=112) were unbooked cases.

Maximum incidence of preterm births occurred in nulliparous women - 42.3% (n=61), followed by 32% (n=46) in primiparous women and 25.7% (n=37) of preterm births occurred in women of higher parity. Among the cases, 23.6% had history of previous abortions, either spontaneous or induced, 15.9 % had history of previous preterm deliveries, and 9.7 % had history of IUD while the remaining 8.3 % had no relevant history. Among the cases, 42.3% had a BMI less than 18, 31.9% had a BMI of 19 to 30 and 25.6% had a BMI greater than 30.Majority of the cases had BMI less than18kg/m^2.

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Among the cases, about 38.2%(n=55) had infectious origin, in which 26.3 % (n=38) were due to urinary infections , 9%(n=13) cases were due to vaginal infections and 2.7%(n=4) were due to infective focus in some other site. In the 38 cases of urinary infection causing preterm labor, commonest infective organism isolated was *Escheresia coli* in 52.7% (n=20) cases. *Klebsiella* was found in 26.4% (n=10). *Coagulase positive staphylococci* was seen in 15.7% (n=6) cases and Proteus in 5.2% (n=2) cases. Among the cases of vaginal infections, *Coagulase positive Staph aureus* was found in 38.4% of cases. *Escheresia coli* and B-*haemolytic* streptococci in 23.1% of cases each and *Klebsiella* found in 15.4% of cases.

Out of the total cases of preterm birth, 66 % (n=95) of cases were medically indicated for maternal or fetal conditions. Out of 95 cases of medically indicated cases of preterm birth, 39 cases were indicated due to preeclampsia or *eclampsia,* 26 cases due to fetal distress, 17 cases due to IUGR, 6 cases due to placenta *previa,* 4 due to diabetes mellitus, 2 cases due to *abruptio* placenta and one case due to chronic hypertension. Out of 100 cases of preterm deliveries studied, 66 % (n=95) delivered preterm due to iatrogenic or medically indicated causes. Among them, most common indication was preeclampsia, accounting to about 41 % (n=39). Next common cause was fetal distress about 27.3% (n-=26). IUGR accounted to about 18% (n=17). Next in order were placenta previa - 6.3%, diabetes mellitus- 4.2%, placenta previa - 2.1% and chronic hypertension - 1.1%.

A total of 152 babies (8 twins) were born preterm. Their prematurity is further graded as late, early or extreme preterm with respective to gestational age. The perinatal mortality was 7.63 % (n=11). Out of 152 preterm births, 91.4 %(n=139) were late preterm, 6.6% (n=10) were early preterm and 3% (n=3) were extremely preterm. In extremely preterm babies, there was 100% mortality (3 neonatal deaths), in early preterm there was 60% mortality (6 deaths) and in late preterm there was 14.3% mortality (2 deaths). Hence as gestational age advances, neonatal mortality reduces. Various causes of death are extreme prematurity, respiratory distress, hypoxia, intraventricular hemorrahage, etc. Among the surviving babies, 25 % faced several morbidities for which they needed admission in the NICU for several days. Various causes of admission are prematurity, respiratory distress, transient tachypnoea of newborn, sepsis, etc.

Discussion

Various changes have occurred in the causative factors for preterm mortality over years. This study is helpful in understanding this change and helps to focus on the new causes that are really contributing to the increased number of preterm deaths. India is ranked first in number of preterm births with approximately 3.5 million preterm births, accounting for 13% of all live births in India(WHO,2015)5. In the present study 2015, the incidence of preterm labor was 10.29%. This is the slightly lesser than average incidence of India and worldwide. This can be attributed to good antenatal care and better follow up of high risk cases.

In the present study, 34% of cases were spontaneous preterm and 66% were induced due to medical disorders. As present study was conducted in tertiary referral centre, there is greater incidence of iatrogenic preterm births compared to other studies. The causes identified in iatrogenic preterm births in this study are preeclampsia - 40.09% (n=27), fetal distress - 27.2% (n=18), intrauterine growth retardation - 18.1% (n=12), Placenta previa - 6% (n=4), Diabetes mellitus – 4.5% (n=3), Abruption placenta – 1.5% (n=1), Chronic hypertension – 1.5% (n=1). These results are exactly following the current raising trend of iatrogenic preterm births world-wide.

Yang et al (2011) conducted a retrospective study to review a cohort of 828 cases of iatrogenic preterm births and found that the incidence of iatrogenic preterm births was 49.8% of total recorded preterm births4. Avraham sarit et al., in June 2014, found in her study that about 80% of all preterm births in developed countries are attributed to iatrogenic late preterm births[5].

Among singleton pregnancies, the increase in the overall preterm birth rate is largely driven by a concurrent temporal increase in the medically indicated preterm births. Thus it is very clear that the iatrogenic preterm birth is the most important danger for increased preterm birth as well as increased perinatal mortality rate in days to come.

Conclusion

The incidence of preterm births is rising mainly due to increase in the number of medically indicated preterm births. The main cause of the iatrogenic preterm birth in this study is preeclampsia. The spontaneous preterm birth rate is plateauing due to better antenatal care. The number of premature babies adding up is mainly due to medically indicated causes. The rise in perinatal mortality is due to complications of prematurity. To reduce this perinatal mortality more and more studies are required in the area of iatrogenic preterm births for better fetal outcome.

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