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A study on iatrogenic preterm deliveries

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Abstract
Aim: *The study was conducted to investigate the incidence, causes and delivery methods of iatrogenic preterm births.*
Material & Methods:*It was a one year retrospective study conducted in the Department of obstetrics and gynecology, IGMC Shimla, Himachal Pradesh from 1st August 2017 to 31st July 2018. All mothers who had iatrogenic preterm deliveries between 24 to 37 weeks were included in the study. The data was collected from the mother'scase sheet. Parametric and non-parametric test of significance were used to find the association between different quantitative and qualitative variable.*
Results:*There were 6533 deliveries in the hospital during study period of which 720 were preterm deliveries. Incidence of preterm deliveries in our institution was 11.4%. Out of720 deliveries 66 (1%) cases had iatrogenic preterm deliveries for some maternal and fetal indications. Most common indication was PIH. Other causes were APH, Fetal growth restriction and intrahepatic cholestasis of pregnancy. 47 cases were delivered by cesarean section and 19 cases had vaginal delivery.*
Conclusions: *PIH, fetal growth restriction and placental abruption, conditions associated with ischemic placental disease are most common causes for iatrogenic preterm deliveries. Cesarean delivery was the main delivery method among iatrogenic preterm births. Obstetricians should choose the delivery method strictly.*
Key words: *Cause, delivery method, iatrogenic preterm birth, incidence, preterm birth.*

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I. Introduction

Preterm birth is a major obstetric and paediatric challenge. It is devastating complication with substantial medical, emotional and social impacts[.1] In high-income countries, the incidence of preterm birth is between 5 and 12%.[2,3]Preterm birth has become the leading cause of neonatal death[4]. It has caused severe paediatric morbidity and disability in the world.[5–7]. The average hospital costs for preterm infants are 25 times higher and their average length of hospital stay is 11 days longer than those of uncomplicated births[1]. In India, incidence of preterm labour is 23.3% and of preterm delivery is 10-69%.[8] In addition to its contribution to mortality,preterm birth has lifelong effects on neurodevelopmental functioning of the new-borns such as increased risk of cerebral palsy, impaired learning and visual disorders and an increased risk of chronic disease in adulthood. The economic cost of preterm birth is high in terms of neonatal intensive care and ongoing health care and educational needs. The social cost is also high, with many families experiencing the sudden loss of a preterm baby or a stressful hospital stay, sometimes for months.[9]

There are three main causes of preterm birth: medically indicated (iatrogenic) preterm birth (25%; 18.7– 35.2%), preterm premature rupture of membranes (PPROM) (25%; 7.1–51.2%) and spontaneous preterm birth (50%; 23.2–64.1%).[10,11]Nowadays it has been seen that an increasing proportion of preterm births have resulted from medical interventions, and medically indicated preterm birth has become the leading cause of the preterm birth in many countries.[12,13]Therefore we conducted a retrospective study to review preterm birth records to learn the incidence, causes and delivery methods of the iatrogenic preterm births that occurred in a tertiary hospital of India.

II. Method

Medical records of preterm births were retrospectively reviewed in the Department of ObstetricsIGMC Shimla HP from 1st August 2017 to 31st July 2018.

The preterm birth is defined as a birth that occurs between >24 and <37 weeks of gestation. Iatrogenic preterm birth is a birth inductionoraprelaborcesarean formedicalreasons and in the absence of PPROM and spontaneous preterm birth at preterm gestation. The fetal death in utero, preterm deliveries for congenital malformation and induced delivery for unwanted pregnancy were excluded from preterm birth. Preterm births were divided on the basis of gestational age into:

- Late preterm births: between 34-36 weeks
- Early preterm birth: between 32-34 weeks.
- Very preterm birth: between 28-32 weeks.
- Extreme preterm birth: before 28 weeks.

Institutional ethical clearance was obtained prior to commencement of this study. Data collected was transformed into MS excel sheet for further processing and analysis. Appropriate statistical software and tools were used for analysing the data.

III. Results

The incidence rate of iatrogenic preterm birth

There were 6533 deliveries in the hospital during one year of study period of which 720 were preterm deliveries, giving incidence of 11.4%. Of these 720 preterm births, 66 (1%) were medically indicated. These accounted for 9.1% of the total preterm births.

The causes of iatrogenic preterm birth

The causes necessitating iatrogenic preterm birth included the following four causes:

1. PIH: Hypertensive disorder complicating pregnancy. There were 25 (37.9%) deliveries indicated for resolution of a hypertensive disorder complicating pregnancy. Among these were 17 cases of severe pre-eclampsia (the diagnostic criteria of which were BP ≥160/110 mm Hg, proteinuria 2.0 g/24 h or ≥2+dipstick,serum creatinine >12 mg/L unless known to be previously elevated, platelets $<100\times10^9$/L, increased lactate dehydrogenase, elevated alanine transaminase or aspartate transaminase, persistent headache or other cerebral or visual disturbance, persistent epigastric pain), 3 cases of eclampsia (which was defined as seizures that cannot be attributed to other causes in a woman with pre-eclampsia),3cases of HELLP syndrome (hemolysis,elevatedliver enzymes, and low platelets syndrome) and 2 cases of pre-eclampsia superimposed upon chronic hypertension.

2. Ante partum haemorrhage (APH): 20(30.3%) cases had APH in which 16 cases had placenta previa and 4 cases had abruptio placenta.

3) Fetal growth restriction: Fetal weight <10th centile was seen in 19 cases (28.8%). These cases were delivered prematurely as continuing the pregnancy till term could cause fetal demise.

4).Intrahepatic cholestasis of pregnancy was seen in 2 (3.0%) cases where induction was done in view of fetal affection.

Delivery methods

Of the 66 iatrogenic preterm births, 19 (29%) were vaginal deliveries and 47 (71%) underwent cesarean section. Of the other preterm births (including PPROM, and spontaneous preterm birth), 585 (89%) were vaginal deliveries and the other 69(11%) underwent cesarean section. The incidences of vaginal and cesarean deliveries among the iatrogenic preterm births were significantly different from those of the other group.

IV. Discussion

The incidence of preterm birth worldwide is alltime high and increasing in frequency. It is reported that the medical indications have played important roles in the increase of preterm birth. The concept of separating preterm birth on the basis of their underlying clinical subtypes to understand etiologies is not new[14-16] It has been recognised that preterm birth is heterogeneous end pointwith two major subtypes, namely spontaneous and medically indicated preterm birth.[17] Much of the attentionhas been focused on its origins as well as the predictionand prevention of spontaneous preterm birth. However, 20% to 35% of all preterm births are iatrogenic(medically indicated), and data with regard to the originsof medically indicated preterm births are virtuallynonexistent[18].

In our study we identify the 3 major etiologies for preterm birth: 1. Pregnancy induced hypertension (37.9%).2 antepartum heamorrhage (30.3%). 3 Fetal growth restriction (28.8%). We believe that these observationsoffer new insights toward understanding the origins ofiatrogenic preterm births. In a similar study

in singleton gestations noted that preeclampsia (43%), fetalgrowth restriction or fetal distress (37%), and placentalabruption (7%) to be implicated in 87% of all medicallyindicated preterm births at less than 37 weeks.[18]

The delivery method should be decided with the least possible trauma to both mother and fetus. In our study, we observed that cesarean delivery was the main delivery route of medically-induced preterm birth. The result was the same in other studies also.However in a similar study it was seen that cesarean was not associated with either reduced mortality or neuro-disability at 2 years of age. Also, cesarean delivery may be hazardous for the mother, with risks including anaesthesia, trauma to the adjacent structures, hemorrhage, pelvic infection, and uterine rupture during subsequent pregnancies[19]. Therefore the method of delivery of premature infants should be based on obstetric or maternal indications.

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