

## STUDY OF ASSOCIATION OF RISK FACTORS WITH FETOMATERNAL OUTCOME

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### **ABSTRACT:**

**Introduction:** Preterm Birth and low birth weight are most important factors affecting life of neonate. Labour itself is considered re-birth for Mother. Many factors during labour affect life of mother like operative delivery, PPH, etc. We are dealing with two lives- Mother and the baby. If we know what are preventable and or treatable risk factors causing these complications, we can reduce the unfavorable outcomes. Teenage, adequate Antenatal care, anemia, thyroid disorder, gestational diabetes mellitus, PIH are some of these risk factors. Teenage pregnancy is known to have unfavorable/ bad outcomes<sup>5</sup>. They are more likely to experience complications like pregnancy-induced hypertension (PIH) and early labour onset. Premature birth and low birth weight (LBW) were more common in teenage mothers along with maternal anemia.<sup>4</sup> Adequate antenatal care is found to reduce risk in pregnancy. It can reduce the risk of stillbirths and pregnancy complications and give women a positive pregnancy experience.<sup>6</sup> Maternal anemia contributes to preterm birth and low birth weight and increases the risk of maternal mortality.<sup>7</sup> Adverse maternal health outcomes pertaining to maternal anemia were Fetal growth restriction, need for cesarean delivery, diabetes, hypertension and increased risk for maternal mortality. Hence, with this background, the present study is conducted in MGM MCHA, We have studied association of risk factors like teenage pregnancy, anemia, antenatal care, gestational diabetes mellitus, hypothyroidism and PIH with Preterm birth, low birth weight, PPH, operative delivery, maternal death, and stillbirth. **Method:** We enrolled 104 pregnant women when they came for labour room admission at MGM MCHA. Risk factors like teenage pregnancy, whether or not she has received adequate antenatal care, maternal anemia, hypothyroidism, GDM, PIH were noted. Pregnancy outcomes like, preterm labour, low birth weight, operative delivery, PPH, still birth and maternal death were studied. The association of risk factors with pregnancy outcomes with help of odds ratio was measured. **Result:** Positive correlation is noted with preterm birth, operative delivery and maternal death with teenage pregnancy. Positive correlation noted with PPH and operative delivery in patients who received Inadequate antenatal care. Patients who had anemia were more likely to have preterm births and PPH. No correlation noted with hypothyroidism with any of the feto-maternal outcomes. GDM has positive correlation with PPH and still birth. PIH has positive correlation with low birth weight and operative delivery. **Conclusion:** Preterm birth is associated with teenage pregnancy and maternal anemia. Low birth weight associated with PIH. PPH is associated with Inadequate antenatal care, maternal anemia and GDM. Operative delivery is associated with teenage pregnancy, Inadequate antenatal care and PIH. Maternal death can be associated with risk factor like early age of pregnancy i.e. teenage pregnancy. Still birth is associated with Gestational diabetes mellitus.

**Keywords:** Teenage Pregnancy, Feto-maternal Outcome, GDM, Anemia, PIH, LBW, PPH, Operative delivery and preterm births.

### **INTRODUCTION:**

Preterm Birth and low birth weight are most important factors affecting life of neonate. Labour itself is considered re-birth for Mother. Many factors during labour affect life of mother like operative delivery, PPH, etc. We are dealing with two lives- Mother and the baby.

If we know what are preventable and or treatable risk factors causing these complications, we can reduce the unfavorable outcomes. Teenage, adequate Antenatal care, anemia, thyroid disorder, gestational diabetes mellitus, PIH are some of these risk factors. Teenage pregnancy is known to have unfavorable/ bad outcomes<sup>5</sup>. They are more likely to experience complications like

pregnancy-induced hypertension (PIH) and early labour onset. Premature birth and low birth weight (LBW) were more common in teenage mothers along with maternal anemia.<sup>4</sup> Adequate antenatal care is found to reduce risk in pregnancy. It can reduce the risk of stillbirths and pregnancy complications and give women a positive pregnancy experience.<sup>6</sup> Maternal anemia contributes to preterm birth and low birth weight and increases the risk of maternal mortality.<sup>7</sup> Adverse maternal health outcomes pertaining to maternal anemia were Fetal growth restriction, need for cesarean delivery, diabetes, hypertension and increases risk for maternal mortality. Adverse birth outcomes considered pertaining to maternal anemia were low birth weight, stillbirths, early neonatal deaths, perinatal deaths, preterm birth, and prolonged labor. The main exposure variable was maternal anemia status.<sup>7</sup> Thyroid disorder such as hypothyroidism is found to be a risk factor which can lead to early abortions, Preterm birth, low birth weight, and respiratory difficulty in the newborn.<sup>8</sup> The importance of thyroxine in healthy embryonic brain development has been adequately demonstrated over the years.<sup>8</sup> Gestational diabetes mellitus and Pregnancy induced Hypertension are also few of the risk factors which are predictors associated with unfavorable outcomes of pregnancy. Hypertensive disorders of pregnancy are associated with a number of perinatal complications such as prevalence of preterm deliveries, low birth weights, increased need for NICU admissions and still births.<sup>9</sup> Furthermore, multivariate logistic studies done on populations of diabetic mothers have

concluded that women with diabetes have lower likelihood of vaginal deliveries and increased chances of development of co-morbidities like hypertensive disorders of pregnancy.<sup>10</sup> We have studied association of risk factors like teenage pregnancy, anemia, antenatal care, gestational diabetes mellitus, hypothyroidism and PIH with Preterm birth, low birth weight, PPH, operative delivery, maternal death, and stillbirth.

**AIM:**

- Study of association of risk factors with feto-maternal outcome.

**OBJECTIVES:**

1. To study proportion of risk factors with feto-maternal outcome.
2. To study association of risk factors with feto-maternal outcome.

**METHODOLOGY:**

We enrolled 104 pregnant women when they came for labour room admission. Risk factors like teenage pregnancy, whether or not she has received adequate antenatal care, maternal anemia, hypothyroidism, GDM, PIH were noted. Pregnancy outcomes like, preterm labour, low birth weight, operative delivery, PPH, still birth and maternal death were studied. The association of risk factors with pregnancy outcomes with help of odds ratio was measured.

**OBSERVATIONS:**

**Table No. 1 – Correlation of Teenage with Feto-maternal Outcome**

EXPOSURE	Preterm birth	Low birth weight	PPH	Operative delivery	Maternal Death	Still Birth
Teenage (52/104)	Odds ratio <b>1</b>	Odds Ratio 0.52	Odds Ratio 0.38	Odds Ratio <b>1.63</b>	Odds Ratio <b>1</b>	Odds Ratio 0.25

Positive correlation is noted with preterm birth, operative delivery and maternal death with teenage pregnancy.

**Table No. 2 – Correlation of Inadequate Antenatal care with Feto-maternal outcome**

EXPOSURE	Preterm birth	Low birth weight	PPH	Operative delivery	Maternal Death	Still Birth
Inadequate Antenatal care (28/104)	Odds Ratio 0.89	Odds Ratio 0.91	Odds Ratio <b>1.28</b>	Odds Ratio <b>1.04</b>	Odds Ratio Less than 1	Odds Ratio 0.09

Positive correlation noted with PPH, Operative delivery in patients who received Inadequate antenatal care.

**Table No. 3 – Correlation of Maternal anemia with Feto-maternal outcome**

EXPOSURE	Preterm birth	Low birth weight	PPH	Operative delivery	Maternal Death	Still Birth
Maternal Anemia (22/104)	Odds Ratio <b>1.01</b>	Odds Ratio 0.86	Odds Ratio <b>1.34</b>	Odds Ratio 0.26	Odds Ratio Less than 1	Odds Ratio 0.17

Patients who had anemia were more likely to have preterm births and PPH.

**Table no. 4 – Correlation of Hypothyroidism with Feto-maternal outcome**

EXPOSURE	Preterm birth	Low birth weight	PPH	Operative delivery	Maternal Death	Still Birth
Hypothyroidism (9/104)	Odds Ratio 0.66	Odds Ratio 0.41	Odds Ratio 0.47	Odds Ratio 0.91	Odds Ratio Less than 1	Odds Ratio Less than 1

No correlation noted with hypothyroidism with any of the feto-maternal outcomes.

**Table No. 5 – Correlation of GDM with Feto-maternal outcome**

EXPOSURE	Preterm birth	Low birth weight	PPH	Operative delivery	Maternal Death	Still Birth
GDM (26/104)	Odds Ratio 0.66	Odds Ratio 0.81	Odds Ratio <b>1.16</b>	Odds Ratio 0.11	Odds Ratio Less than 1	Odds Ratio <b>1.33</b>

GDM has positive correlation with PPH and still birth.

**Table No. 6 – Correlation of PIH with Feto-maternal outcome**

EXPOSURE	Preterm birth	Low birth weight	PPH	Operative delivery	Maternal Death	Still Birth
PIH (3/104)	Odds Ratio Less than 1	Odds Ratio <b>1.09</b>	Odds Ratio Less than 1	Odds Ratio <b>1.21</b>	Odds Ratio 0.03	Odds Ratio Less than 1

PIH has positive correlation with low birth weight and operative delivery.

## **DISCUSSION:**

In our study, **Positive correlation is noted with preterm birth, operative delivery and maternal death with teenage pregnancy.** There are debates on the manner of birth in young mothers; some studies have found that vaginal deliveries are more common, may be because of the small size of the baby. Furthermore, some researchers have suggested that Cephalopelvic disproportion is the reason of a higher caesarean section rate, which is attributable to the biological immaturity of the adolescent pelvis. As discussed by **Omole-Ohonsi A, Attah RA et al<sup>1</sup>** Maternal death rates are greater among adolescent mothers, according to studies by **Kwast et al<sup>16</sup> and Harrison et al<sup>17</sup>**. Preterm birth was the most common newborn problem, which is similar to previous studies such as **Gazala Yasmin et al and Dr Rupakala B M et al**. Teenage pregnancies may not be avoided as a whole due to deep seated traditions or cultures in Indian setting but with adequate antenatal check ups, i.e. adequate antenatal booking- risk of pregnancy and its outcome may differ positively. In our study, **Positive correlation is noted with PPH and Operative delivery in patients who received Inadequate antenatal care.** There are various studies that support the fact that inadequate antenatal care contributes to various adverse feto-maternal outcomes. Maternal anemia leading to preterm birth, low birth weight and PPH in mothers, specially early age group pregnancies. **Xi-Kuan Chen- Shi Wu Wen et al<sup>3</sup>** discusses these associations along with various other factors. When a patient is inadequately booked during

ANC, her pregnancy outcome is adversely affected.<sup>5,7</sup> In our study, **Patients who had anemia were more likely to have preterm births and PPH.** This is supported by a study- **Beckert, R.H., Baer, R.J., Anderson, J.G. et al<sup>11</sup>** Anemic mothers were more likely to be diagnosed with hypertension, diabetes, placental abruption, or chorioamnionitis, or require a blood transfusion. Also Infants born to anemic mothers were more likely to be born preterm but not more likely to suffer morbidities associated with prematurity. the diagnosis of anemia in pregnancy carries a higher risk of peri-partum, intra-partum, and post-partum complications for the mother, and a higher risk of preterm birth for the infant.<sup>11</sup> Anemia is becoming more common due to a lack of proper antenatal care, low socioeconomic status, nutritional deficiencies due to a lack of awareness about the importance of taking folic acid and iron prophylaxis, as well as decreased intake of iron-rich foods and improper iron absorption during the antenatal period. The government has started some schemes such as the Integrated Child Developmental Services Scheme, which provides six types of services: supplemental nutrition, immunization, health checkups, referral services, preschool non formal education, nutrition and health education, with a focus on girl children aged 11 to 18 years old, through -Anganwadi workers at a village center called “Anganwadi”. Even with these programs and some NGO services, there is still an increase in the frequency of anemia in rural regions, which should be targeted. **Anemia contributes to preterm birth and preterm delivery is justified by findings in our study.**

In our study, **No correlation noted with hypothyroidism with any of the feto-maternal outcomes.** There are various studies like study by **Rakesh Kumar Sahay et al<sup>14</sup> and Rodica TUDOSA et al<sup>12</sup>** that have found that untreated maternal hypothyroidism can lead to preterm birth, low birth weight, and respiratory distress in the neonate. Enough evidence has accumulated over the years about the role of thyroxine in normal development of the fetal brain.

In our study, **GDM has positive correlation with PPH and still birth.** Patients with gestational diabetes mellitus are more likely to have post partum hemorrhage and have still birth. GDM has been associated to have adverse feto-maternal outcomes. It can be noted from a study conducted by **Miroslava Gojnic et al<sup>10</sup>** that multiple adverse feto-maternal outcomes can be associated with GDM like chances of having still birth, suden IUFD, macrosomia, need for NICU admission for baby, maternal hyperglycemia and later developing medical disorders like diabetes mellitus II in mothers.

In our study, **PIH has positive correlation with low birth weight and operative delivery.** Over the years, extensive research has been carried out for pre-eclampsia, PIH which has only proved that Hypertensive disorders of pregnancy are associated with a number of perinatal complications such as prevalence of preterm deliveries, low birth weights, increased need for NICU admissions and still births.<sup>9</sup> in our study it is noted that need for operative delivery and low birth weight are most associated with patient having PIH. In a study conducted by **Mekoya D. Mengistu et al<sup>9</sup>**, It is noted that Teenage age and low hemoglobin levels were predictors of maternal complication.

### **SUMMARY:**

- Positive correlation is noted with preterm birth, operative delivery and maternal death with teenage pregnancy.
- Positive correlation noted with PPH, Operative delivery in patients who received Inadequate antenatal care.
- Patients who had anemia were more likely to have preterm births and PPH
- No correlation noted with hypothyroidism with any of the feto-maternal outcomes.
- GDM has positive correlation with PPH and still birth.
- PIH has positive correlation with low birth weight and operative delivery.

### **CONCLUSION:**

- Preterm birth is associated with teenage pregnancy and maternal anemia.

- Low birth weight associated with PIH.
- PPH is associated with Inadequate antenatal care, maternal anemia and GDM
- Operative delivery is associated with teenage pregnancy, Inadequate antenatal care and PIH.
- Maternal death can be associated with risk factor like early age of pregnancy i.e. teenage pregnancy.

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