

ORIGINAL RESEARCH**Identification of various maternal factors that lead to poor fetal outcome****¹Priyanka Patel, ²Ajit Anand Asati, ³Jitendra Singh Dangi**¹Assistant Professor, Department of Obstetrics and Gynecology, Bundelkhand Medical College, Sagar, Madhya Pradesh, India²Assistant Professor, Department of Pediatrics, Bundelkhand Medical College, Sagar, Madhya Pradesh, India³Assistant Professor, Department of Surgery, Bundelkhand Medical College, Sagar, Madhya Pradesh, India**Corresponding Author**

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Abstract**Background:** The present study was conducted for identification of various maternal factors that lead to poor fetal outcome.**Materials & methods:** 216 patients (108 control & 108 cases) admitted in BMC Sagar who were satisfying the inclusion and exclusion criteria of the study were enrolled conveniently after their written informed consent. For Cases, patients of High-risk pregnancy (PIH, Pre Eclampsia, Eclampsia, Severe Anaemia, Placenta Previa, Placenta Abruptio, Gestational Diabetes, Twin Pregnancy, Precious Pregnancy, Pregnancy with Thyroid disease) were enrolled. For controls, Primigravida & Multigravida subjects with no risk pregnancy were enrolled. Qualitative data was analyzed and explained as frequency and percentage. Bar charts and pie charts are used to explain frequency and percentage. Appropriate statistical tests were applied (Yate's Chi-Square test).**Results:** Out of 108 (high-risk) cases, 75 (34%) patients delivered healthy babies, 16 (7%) patients delivered preterm babies, 08 (3%) delivered IUGR babies, and 09 (4%) delivered IUFD. Out of 35 Anemic cases, 32 (91%) patients delivered healthy babies, 2 (5.7%) patients delivered preterm babies, none of the patients delivered an IUGR baby, and 01 (2.8%) delivered IUFD. Out of cases 6 gestational HTN, 6(100%) patients delivered healthy babies, none of the patients delivered preterm babies, none of the patients delivered IUGR babies, and none of the patients delivered IUFD. Out of 18 severe Pre Eclampsia cases, 9(50%) patients delivered healthy babies, 3(16%). patients delivered preterm babies, 04(22%) delivered IUGR babies, and 02(11.1%) delivered IUFD. Out of 8 Eclampsia cases, 3 (37%) patients delivered healthy babies, and 1 (12.5%) patient. delivered preterm babies, 2 (25%) delivered IUGR babies, and 2 (25%) had delivered IUFD. Out of 8 placenta previa cases, 06 (75%) patients delivered healthy babies, 1(12.5%) patient delivered a preterm baby, none of the patients delivered an IUGR baby, and 01 (12.5%) patient delivered an IUFD baby. Out of 06 Placenta Abruptio cases, 02 (33.3%) patients delivered healthy babies, 02 (33.3%) patients delivered preterm babies, none of the patients delivered an IUGR baby, and 02 (33.3%) had delivered IUFD.

Conclusion: There is a high correlation between high-risk pregnancies and poor perinatal outcomes. All the findings of our study show the importance of the identification of risk factors from the comprehensive medical history of women in early pregnancy. Based on the identification of risk factors, the screening should begin early to detect and treat the condition before it endangers the survival of the mother and fetus.

Key words: high-risk pregnancy, preterm birth, small newborns, term baby, low reservoir, stillbirth, early neonatal death, prenatal care

Introduction

A high-risk pregnancy (HRP) is a pregnancy in which the mother's environment or past reproductive performance poses a significant risk to the mother and fetus. High-risk pregnancy affects the well-being of the fetus, such as preterm birth, small newborns, term baby with a low reservoir or stillbirth, and early neonatal death. Identification of patients at risk of these complicated pregnancies with poor outcomes is the foundation of prenatal care.¹⁻³

A high-risk pregnancy threatens the health or life of the mother or her fetus. For most women, early and regular prenatal care supports a healthy pregnancy and birth without complications.² Perinatal mortality varies widely and can be as low as 10/1000 in some developed countries and more than 10 times higher in developing countries. Premature birth, intrapartum complications (birth asphyxia or inability to breathe), infection, and birth defects are the main causes of most newborn deaths.^{3, 4} Nearly 5,29,000 women worldwide die each year from pregnancy-related causes; for every death, nearly 118 women suffer life-threatening events or severe acute morbidity. While the main causes of most newborn deaths are infections and birth defects. Infants who die within the first 28 days after birth suffers from conditions and diseases associated with a lack of quality care at birth or immediately after birth and in the first days of life.⁴⁻⁶

Criteria for high-risk pregnancy include the following: teenage pregnancy and women over 35 years of age, preeclampsia, eclampsia, gestational hypertension, height less than 140 cm, parity above 4, twin pregnancy, placenta previa, placenta abruptio, rare pregnancy, chronic hypertension in pregnancy and a history of chronic medical conditions such as severe anemia, diabetes, and thyroid disorders. With proper care, healthy and viable babies are born from up to 95% of high-risk pregnancies. The earlier the problem is detected, the greater the chance that both the mother and the newborn will remain healthy. Access to perinatal care, early detection of high-risk pregnancies, close monitoring, and appropriate treatment are essential elements for good fetal outcomes and prevention of perinatal morbidity and mortality. For unknowing or undiagnosed patients who are present, we can screen, diagnose and treat all high-risk pregnancies early together with the proper follow-up to help reduce maternal and perinatal mortality due to high-risk pregnancies.⁵⁻⁸ Hence; the present study was conducted for identification of various maternal factors that lead to poor fetal outcome.

Materials & methods

The present study was conducted for analyzing various Maternal factors that lead to poor Fetal outcome. 216 patients (108 control & 108 cases) admitted in BMC Sagar who were satisfying the inclusion and exclusion criteria of the study were enrolled conveniently after their written informed consent. For Cases, patients of High-risk pregnancy (PIH, Pre Eclampsia, Eclampsia, Severe Anaemia, Placenta Previa, Placenta Abruptio, Gestational Diabetes, Twin Pregnancy, Precious Pregnancy, Pregnancy with Thyroid disease) were enrolled. For controls, Primigravida & Multigravida subjects with no risk pregnancy were enrolled. All the IPD patients were examined in the labour room. Apgar at one minute after birth was noted and any complications like preterm delivery, low birth weight, NICU

admission, stillbirth, and intrauterine death were studied. All the information was recorded in a pre-structured proforma, entered in an MS Excel spreadsheet and analyzed by appropriate statistical method. Qualitative data was analyzed and explained as frequency and percentage. Bar charts and pie charts are used to explain frequency and percentage. Appropriate statistical tests were applied (Yate's Chi-Square test).

Results

Out of 108 control, 100% had no history of high risk in the present pregnancy. Out of 108 (high-risk) cases 35 cases (32.4%) had Anemia, 18(high-risk) cases(16.6%) had Pre-Eclampsia, 8(high-risk) cases(7%) had eclampsia, 6(high-risk) cases (5%) had gestational HTN, 8(high-risk) cases (7.4%) had Placenta Previa, 6(high-risk) cases (5.5%) had placenta abruptio, 7 (high-risk) cases (6.4%) had oligohydramnios, 4 (high-risk) cases (3.7%) had polyhydramnios 6(high-risk) cases (5.5%) had TWIN, 3 (high-risk) cases(2.7%) had precious pregnancy, 4 (high-risk) cases (3.7%) had GDM, 3 (high-risk) cases (2.7%) had pregnancy with thyroid disease. Out of 108 control, 94(43%) patients delivered healthy babies, 08(3%) patients delivered preterm babies, 4 (1%) delivered IUGR babies, and 2 (0.9%) had delivered IUFD. Out of 108 (high-risk) cases, 75 (34%) patients delivered healthy babies, 16 (7%) patients delivered preterm babies, 08 (3%) delivered IUGR babies, and 09 (4%) delivered IUFD. Out of 35 Anemic cases, 32 (91%) patients delivered healthy babies, 2 (5.7%) patients delivered preterm babies, none of the patients delivered an IUGR baby, and 01 (2.8%) delivered IUFD. Out of cases 6 gestational HTN, 6(100%) patients delivered healthy babies, none of the patients delivered preterm babies, none of the patients delivered IUGR babies, and none of the patients delivered IUFD. Out of 18 severe Pre Eclampsia cases, 9(50%) patients delivered healthy babies, 3(16%). patients delivered preterm babies, 04(22%) delivered IUGR babies, and 02(11.1%) delivered IUFD. Out of 8 Eclampsia cases, 3 (37%) patients delivered healthy babies, and 1 (12.5%) patient. delivered preterm babies, 2 (25%) delivered IUGR babies, and 2 (25%) had delivered IUFD. Out of 8 placenta previa cases, 06 (75%) patients delivered healthy babies, 1(12.5%) patient delivered a preterm baby, none of the patients delivered an IUGR baby, and 01 (12.5%) patient delivered an IUFD baby. Out of 06 Placenta Abruptio cases, 02 (33.3%) patients delivered healthy babies, 02 (33.3%) patients delivered preterm babies, none of the patients delivered an IUGR baby, and 02 (33.3%) had delivered IUFD.

Out of 07 oligohydramnios cases, 03 (42.8%) patients delivered healthy babies, 02 (28.5%) patients delivered preterm babies, 01 (14.2%) patient delivered an IUGR baby, and 01(14.2%) patient delivered an IUFD baby. Out of 04 polyhydramnios cases, 02(50%) patients delivered healthy babies, 02(50%) patients delivered preterm babies, none of the patients delivered an IUGR baby and none of the patients delivered IUFD babies. Out of 06 TWIN cases, 04(66.6%) patients delivered healthy babies, 02(33.3%) patients delivered preterm babies, none of the patients delivered an IUGR baby, and none of the patients delivered an IUFD baby. Out of 03 GDM cases, 02(66.6%) patients delivered healthy babies, 01(33.3%) patient delivered preterm babies, none of the patients delivered an IUGR baby, and none of the patients delivered an IUFD baby. Out of 03 precious pregnancy cases, 03(100%) patients delivered healthy babies, none of the patients delivered a preterm baby, none of the patients delivered an IUGR baby and, None of the patients delivered an IUFD baby. Out of 03 cases, 03(100%) patients delivered healthy babies, none of the patients delivered preterm babies, none of the patients delivered IUGR babies and none of the patients delivered IUFD babies.

Table 1: HIGH-RISK IN PRESENT PREGNANCY

S. No.	HIGH RISK IN PRESENT PREG	Control		High Risk Pregnancy	
		No.	Percentage	No.	Percentage
1	ANEMIA	0	0	35	32.407
2	SEVERE PREECLAMPSIA	0	0	18	16.666
3	ECLAMPSIA	0	0	8	7.407
4	GESTATIONAL HTN	0	0	6	5.555
5	PLACENTA PREVIA	0	0	8	7.407
6	PLACENTA ABRUPTIO	0	0	6	5.555
7	OLIGOHYDROAMNIOS	0	0	7	6.481
8	POLYHYDROAMNIOS	0	0	4	3.703
9	TWIN	0	0	6	5.555
10	PRECIOUS PREGNANCY	0	0	3	2.777
11	GESTATIONAL DIABETES MELLITUS	0	0	4	3.703
12	PREGNANCY WITH THYROID DISEASE	0	0	3	2.777
13	TOTAL	108	0	108	100

Discussion

A high-risk pregnancy is any pregnancy-related condition that poses an actual or potential risk to the mother or fetus. Women with risk factors for high-risk pregnancies are four times more likely to develop complications than women with low-risk pregnancies, and women are about one-tenth as likely. A high-risk pregnancy is any condition associated with a pregnancy where there is an actual or potential risk to the mother or fetus. Women with risk factors for high-risk pregnancies have a one-fourth chance of developing one-tenth. The central focus of maternal and childcare programs has been detecting at-risk pregnancies to prevent women from developing obstetric complications in childbirth. Risk assessment is a key component of antenatal care (ANC) and has demonstrated benefits in improving maternal and perinatal outcomes.⁹⁻¹³ Hence; the present study was conducted for identification of various maternal factors that lead to poor fetal outcome.

Out of 07 oligohydramnios cases, 03 (42.8%) patients delivered healthy babies, 02 (28.5%) patients delivered preterm babies, 01 (14.2%) patient delivered an IUGR baby, and 01(14.2%) patient delivered an IUFD baby. Out of 04 polyhydramnios cases, 02(50%) patients delivered healthy babies, 02(50%) patients delivered preterm babies, none of the patients delivered an IUGR baby and none of the patients delivered IUFD babies. Narendra Vaghela et al 2019, this study showed pregnancy complications and related perinatal morbidity as risk factors impacting neonatal outcomes. If mothers had access to appropriate and timely healthcare during pregnancy majority of maternal morbidities could be prevented. Hence proper care and timely referral can have a positive impact on lowering perinatal mortality and morbidity and possibly better maternal outcomes.¹⁴

As compared to normal pregnancy High-risk pregnancy is one of greater risk to the mother or her fetus. In High Risk (at-risk) pregnancy cases there is an increased risk of morbidity or mortality before or after delivery where the mother, fetus, or neonate. At the time of pregnancy, a high-risk pregnancy is grouped in which past reproductive performance or maternal environment presents a significant risk to the fetus such as premature birth, small for date infant, full term with low reservoir stillbirth, and early neonatal death. Marie Gilbert Majella et al 2019 from this study we conclude that almost one-fifth of pregnant women in rural areas have a high-risk pregnancy.¹⁵

Out of 06 TWIN cases, 04(66.6%) patients delivered healthy babies, 02(33.3%) patients delivered preterm babies, none of the patients delivered an IUGR baby, and none of the patients Delivered an IUFD baby. Out of 03 GDM cases, 02(66.6%) patients delivered healthy babies, 01(33.3%) patient delivered preterm babies, none of the patients delivered an IUGR baby, and none of the patients delivered an IUFD baby. Out of 03 precious pregnancy cases, 03(100%) patients delivered healthy babies, none of the patients delivered a preterm baby, none of the patients delivered an IUGR baby and, None of the patients delivered an IUFD baby. Out of 03 cases, 03(100%) patients delivered healthy babies, none of the patients delivered preterm babies, none of the patients delivered IUGR babies and none of the patients delivered IUFD babies. High-risk pregnancy was classified based on the guidelines from Pradhan Mantri Surakshit Matritva Abhiyan and outcome assessment based on the obstetric and neonatal outcomes. Unfavorable obstetric and neonatal outcomes were common among high-risk cases. Hence, early detection of high-risk pregnancies needs to be done at the primary healthcare level to improve maternal, obstetric, and neonatal outcomes. Imdad et al 2011 found the effectiveness of fetal movement monitoring and Doppler velocimetry for the detection and surveillance of high-risk pregnancies, and their effect on the prevention of stillbirth. In this study, Doppler velocimetry of umbilical and fetal arteries in high-risk pregnancies leads to a reduction of 29% in perinatal mortality compared with no Doppler velocimetry. These results are in agreement with our findings.¹⁶⁻¹⁷

Conclusion

There is a high correlation between high-risk pregnancies and poor perinatal outcomes. All the findings of our study show the importance of the identification of risk factors from the comprehensive medical history of women in early pregnancy. Based on the identification of risk factors, the screening should begin early to detect and treat the condition before it endangers the survival of the mother and fetus. This study underscores the significance of identifying and managing high-risk pregnancies, emphasizing the impact on both maternal and fetal outcomes. The maternal factors examined in this research play a crucial role in predicting and mitigating potential complications during pregnancy, offering valuable insights into the complexities of high-risk pregnancies.

Limitations

Several limitations should be considered when interpreting the findings of this study. Firstly, the study's retrospective design may introduce recall bias, affecting the accuracy of reported data. Prospective studies with real-time data collection could provide more reliable information.

Secondly, the study's single-center nature limits the generalizability of the results to a broader population. Healthcare practices, demographics, and risk factors can vary across different regions, necessitating caution in applying these findings universally.

Moreover, the sample size, while sufficient for the conducted analysis, might restrict the study's ability to detect more nuanced associations or rare outcomes. A larger and more diverse sample could enhance the study's statistical power.

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