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Original Research Article

A case control study to elicit fetal outcome in high-risk pregnancies and to study the various maternal parameters associated with fetal outcomes

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ABSTRACT

Background: High risk pregnancies (HRP) threaten the health or life of the mother or her fetus. Perinatal mortality varies widely in some developed countries and more than 10 times higher in developing countries. For most women, early and regular prenatal care promotes a healthy pregnancy and delivery without complication.
Methods: It is a prospective study conducted in BMC, Sagar of duration one year, keeping in mind the inclusion and exclusion criteria with 216 (108 control and 108 cases) patients included in our study.
Results: study shows that there is a significantly high incidence of IUGR delivery and preterm delivery in HRP as compared to control.
Conclusions: In our study we conclude that there is a high correlation between HRP and poor perinatal outcome thus identifying HRP is important because it is the first step towards prevention perinatal mortality and morbidity.

Keywords: Blood pressure, Hypertension, Pregnancy, Maternal outcome, Perinatal outcome

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. HRP 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]

A HRP 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] Although only 10-30% of mothers observed in the prenatal period can be classified as HRP, they account for 70-80% of perinatal mortality and morbidity.[4]

A HRP is identified as a pregnancy in which the risk of an adverse outcome for the mother and/or baby is greater than the incidence of that outcome in the general population.[6]

Incidence of HRP varies from-region to region and country to country, socio-economic status, environmental factor and literacy. HRP among urban slums, rural areas, and illiterate mothers. Incidence is also high in the largest care facilities. The prevalence of HRP is 5-40%.[7]

A HRP is any condition associated with a pregnancy where there is an actual or potential risk to mother/fetus.[8] Women with risk factors for HRP have 1/4th chance of developing one-tenth.[9] Central focus of maternal and childcare programs has been detecting at risk pregnancies to prevent women from developing obstetric complications in

childbirth.[10,11] Risk assessment is key component of antenatal care (ANC) and has demonstrated benefits in improving maternal and perinatal outcomes.[12-14]

The present study is undertaken with the view of determining the perinatal outcome in HRP and studying the various maternal and fetal parameters associated with fetal outcomes in tertiary care hospitals in Bundelkhand medical college, Sagar (M.P.).

METHODS

Study centre

Study carried out at Bundelkhand medical college, Sagar (M.P.).

Duration of study

The study conducted from the August 2021 to August 2022.

Study design

Prospective observational study design was used in this study.

Selection of the patient

All the IPD patients who delivered in the obstetrics and gynaecology department of BMC Sagar were included in the study population.

Sample size

The two hundred and sixteen (216) patients (108 control and 108 cases) admitted in the BMC Sagar who were satisfy in the inclusion and exclusion criteria of the study were enrolled conveniently after their written informed consent.

Inclusion criteria

For case: In the patient department of obstetrics and gynaecology, primigravida and multigravida, HRP (i.e. PIH, pre-eclampsia, eclampsia, severe anaemia, placenta previa, placenta abruptio, gestational diabetes, twin pregnancy, precious pregnancy, pregnancy with thyroid disease), period of gestation of more than 28 weeks were included.

For control: In the patient department of obstetrics and gynaecology, primigravida and multigravida, pregnancy with no risk were included.

Exclusion criteria

Out-patient department ANC, ANC less than 28 weeks were excluded from study.

Method of collection of data

All the IPD patients were examined in the labour room. These patients were followed during the labour and maternal and perinatal outcome was noted. General physical examination and systemic, abdominal, and pelvic examinations were carried out.

Investigations like complete blood count, sugar, liver function test including SGOT (AST), SGPT (ALT), alkaline phosphatase, renal function tests including serum urea, creatinine, uric acid, coagulation profile, serum TSH, LDH, obstetric USG, and routine microscopy were studied.

Obstetric management was carried out as per department protocol, patients were delivered either by vaginal route or cesarean section. The patients with uncontrolled hypertension were managed in collaboration with physicians and anesthetists.

Maternal outcome on the basis of mode of delivery and any associated complications like acute renal failure, HELLP syndrome, multiorgan failure, retinopathies, preeclampsia, ARDS, PRESS, intraventricular hemorrhage, preeclampsia converted to eclampsia and death was studied.

Ethical consideration

The study was ethically approved by the institutional ethical committee. After the ethical approval study was started and patients were enrolled after their written informed consent. Confidentiality and privacy of participants were maintained. All data was kept in strict confidentiality with access to only the researcher and mentor.

Statistical analysis

Qualitative data was analyzed and explained as frequency and percentage. Bar charts are used to explain frequency and percentage. Appropriate statistical tests were applied (Yate's chi square test).

RESULTS

This study was conducted on 216 patients, out of them 108 were in the control group and 108 were in the cases group, pregnancy outcomes in 216 antenatal patients i.e. fetal outcomes in the control group and in the HRP group. Among 216 patients, the majority of our patients were primipara 57.6%. Around 65.2% were belongs to 18-25 years of age, 56.9% were booked either in our hospital or some other hospital. 42.9% were unbooked but immunized. The majority of them had no significant family history but in high-risk cases, 5.05% had a family history of hypertension and twin pregnancies. The percentage of LSCS is more in HRP as compared to control. In our study, out of 216 patients, the majority of

patients had no maternal complications, but in 3.7% of control had PPH and 9.2% of cases had PPH.

In high-risk cases, 13.8% had a history of anaemia, 10.18% had PIH, and 2.77% had twin pregnancies in a past pregnancy. Our study reveals that in HRP perinatal morbidity and mortality are high, 11 babies (5.08%) were IUD in our study as the majority of the cases were unbooked and presented late in labour with IUD. The incidence of IUGR in control was 1.85% and in cases was 7.4%. The incidence of preterm delivery in control was 7% and in cases was 14%. Our study shows that there is a significantly high incidence of IUGR delivery and preterm delivery in HRP as compared to control.

Table 1: Age distribution.

Age group (in years)	Control		HRP	
	N	%	N	%
18-25	74	34.259	67	31.018
26-30	30	13.888	34	15.74
31-35	4	1.851	6	2.777
36-40	0	0	1	0.462

Table 2: Parity.

Parity	Control		HRP		P value
	N	%	N	%	
Primi	69	31.944	57	26.388	0.09769
Multi	39	18.055	51	23.611	

Table 3: ANC care.

ANC care	Control		HRP		P value
	N	%	N	%	
Booked	75	34.722	48	22.222	0.000207
Unbooked	33	15.277	60	27.777	

Table 4: History of high-risk in past pregnancy.

History of high-risk in past pregnancy	Control		HRP	
	N	%	N	%
Anemia	0	0	15	13.88
PIH	0	0	11	10.18
Twin	0	0	3	2.77
Total	108	0	108	73.2

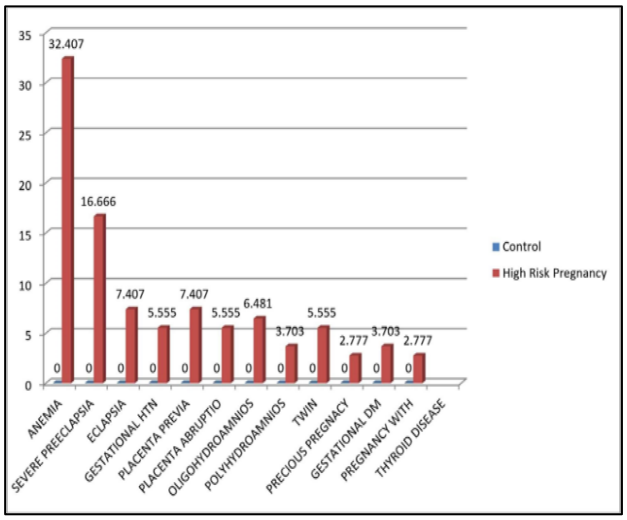

Figure 1: High risk in present pregnancy.

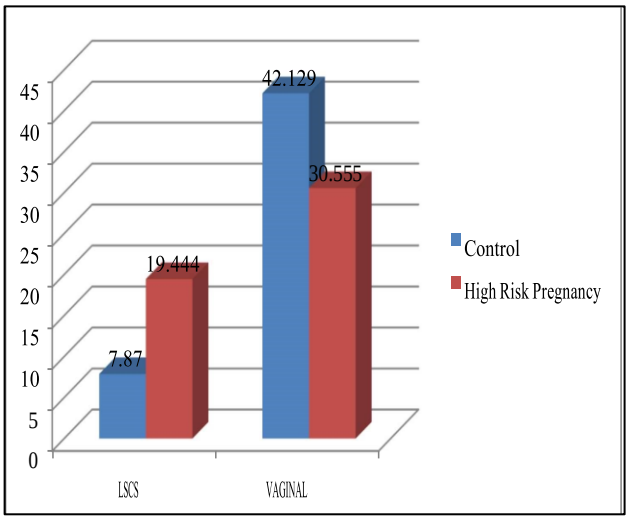

Figure 2: Mode of delivery.

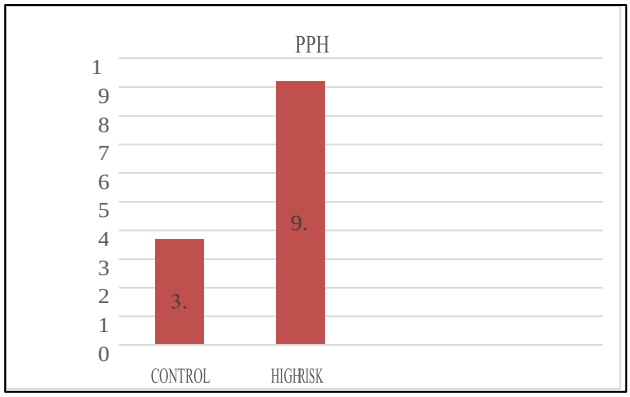

Figure 3: Maternal complications.

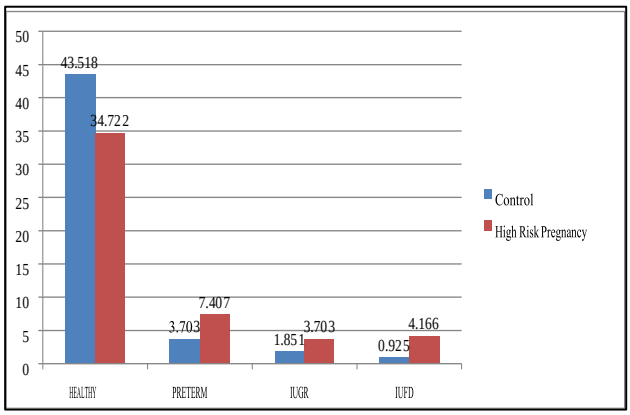

Figure 4: Fetal outcome.

DISCUSSION

In the present study, the maximum number of HRP women were found in the range of age group 18-25 years which is similar to the Ali et al maximum high-risk pregnant women are between 26-30 years and were around 50% of total high-risk pregnant females.[15] Primipara women and multipara have an almost similar incidence of HRP in our study and the findings are contradictory to the study conducted by Chimmel et al shows that primiparous has more adverse maternal and neonatal outcomes than younger women.[16] Present study shows that in control maximum patients were booked and immunized where as in high risk patients less no of booked cases were found, had similar finding with Danish et al study reporting that the incidence of complications in unbooked cases was much higher than the booked cases.[17] Above study conclude that patient who had family history were at more risk which is according to Bezerra et al study reported the risk of preeclampsia was also higher for women who had both a mother and sister with a history of hypertension.[18] Some high risk pregnant women had a history of high risk in the previous pregnancy in present pregnancy which is similar to study conducted by Direkvand-Moghadam et al showed that there is a significant association between preeclampsia and a history of preeclampsia, and considered it the most important variable to predict preeclampsia.[19] Above study shows that the most common cause of HRP is severe anaemia and PIH i.e. (severe pre-eclampsia and eclampsia). A similar study, by Akhtar Ali et al found that the most common cause of HRP is severe anemia followed by bad obstetric history.[15] The percentage of LSCS is more in HRP compared to control. Hamad et al reported a significantly higher rate of C/S in the diabetic patient.[20] Present study conclude that maternal complication is higher in HRP which is similar to Moshood et al it indicated that severe prenatal anemia increases the risk of PPH and PPH-related mortality.[21]

Above study shows that there is a significantly high incidence of IUGR delivery and preterm delivery in HRP as compared to control which was similar to comparative study conducted by Zareen et al. Perinatal mortality was twice as high in the high-risk group compared to the low-risk group.[22] In our study, anaemic patients had preterm and IUD babies. Smith et al found that Anemia was associated with preterm birth, SGA, neonatal death, and perinatal death.[23] Higher rate of adverse perinatal outcome found in women having hypertensive disorder of pregnancy in our study. Vidyadhar et al found that high perinatal mortality in eclampsia followed by pre-eclampsia and gestational HTN.[24] Women with placenta previa and abruptio placenta had preterm and IUD babies more as compare to control. In Katheryne et al study, abruption was associated with elevated risk of preterm birth, intrauterine growth restriction or low birth weight, perinatal mortality, cesarean delivery, postpartum hemorrhage, and transfusion.[25]Above study shows women with oligohydramnios, polyhydramnios, diabetes had more preterm, IUGR and IUFD. The perinatal mortality in twins in present study was more as compared to singletons.[26] Diabetes during pregnancy is associated with higher maternal and fetal morbidity. No comparison was made from the above study due to less no. of cases in our study.

CONCLUSION

There is a high correlation between HRP and poor perinatal outcomes. All the findings of present study show the importance of the identification of risk factors from the comprehensive medical history of women in early pregnancy. In our study we conclude that as the number of risk factors increased maternal and perinatal outcomes have severely deteriorated. Prevention, the screening should begin early to identify risk factors before it endangers the survival of the mother and fetus, and timely management of all HRP by implementing essential interventions, targeting risk factors, and provision of quality health services in the areas of maternal health are recommended. Identifying HRP is important because it is the first step toward the prevention of maternal and perinatal morbidity. The aim is to increase awareness among pregnant women, regarding high-risk factors and their impact on pregnancy outcomes so that they have proper compliance with ANC provided by health system.

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