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A STUDY OF HIGH RISK PREGNANCY AND ITS OUTCOME AMONG ANTENATAL WOMEN ATTENDING A TERTIARY CARE CENTRE IN INDORE

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ABSTRACT **Background:** High-risk pregnancies are associated with adverse perinatal and maternal outcomes. In India, 20-30% of the pregnant patients contribute to high-risk group. As a result, identification of high-risk pregnancy at earliest stage will be useful in directing appropriate intervention. Hence, this study was undertaken to determine the prevalence and outcome of different high-risk factors in antenatal women in Indore, MP. **Material & Method:** A record based retrospective study was undertaken for a period of 1 year from April 2022 to March 2023 among all antenatal women who have attended health center of tertiary care institute. Data of all antenatal high-risk patients attending OPD during one year of study period was taken from hospital records. The parameters considered for diagnosis of high-risk pregnancy were defined as per the guidelines provided by PMSMA Maternal characteristics such as age, gravida/parity, gestational age, and gestational age at the time of first visit were noted. High risk factors were identified and outcome assessment based on the obstetric and neonatal outcomes was done. **Results:** Among 1138 antenatal case record reviewed, 630 (55.3%) were in the age group of 20–25 years and majority (926, 81.4%) belonged to below poverty line families; 820 (74.3%) registered their current pregnancy within the first trimester. The prevalence of high-risk pregnancy among study participants was 13.09%. Majority (81.9%) had term delivery.Parity, socioeconomic status, and unfavorable outcomes such as low-birth weight, preterm, and post term delivery were associated with high-risk pregnancy.**Conclusion:** Antenatal surveillance for the high-risk factors complicating pregnancy may prevent or treat most of the complications. Strategies for early screening of high-risk pregnancy cases should be developed to prevent maternal and perinatal mortality and to improve the maternal and perinatal outcome

KEYWORDS : High-risk pregnancy, low birth weight, cesarean, neonatal outcomes

INTRODUCTION

Pregnancy is a critical period in women's lives in which the women experience different physical, mental, and social changes.[1] Although pregnancy is a physiologic phenomenon, some conditions may endanger maternal or fetal health and thereby, turn pregnancy into a high-risk pregnancy (HRP) and cause women to experience stressful conditions.[2]

Almost 15% of all the pregnant women can develop potentially life-threatening maternal and fetal complications which might require skilled care with some requiring major intervention for survival.[3] Complications can occur anytime during the course of the pregnancy and childbirth, which in turn can affect the health and the overall survival of mother and the fetus.[4]This condition develops as a result of risk factors which may develop during the antenatal period or are already present before the conception. Although, the percentage of pregnancies which can be classified as high risk are only 10-30% of the antenatal women, but these high-risk pregnant women accounts for 70-80% of perinatal mortality and morbidity.[5]

According to World Health Organization (WHO), 800 women per day die due to pregnancy related complications, which may either be present during antenatal period or complications during childbirth.[6] According to NITI AOYOG, MMR (maternal mortality rate) of India has declined from 167 (2011-2013) to 145 (2020-2023). Among southern states, MMR has declined from 93 to 77 (in Kerala, it declined from 61 to 46) but in Madhya Pradesh it is still the 3rd highest with 173/100000 live births.[7]

There are five main reasons for death of pregnant women such as severe hemorrhage, maternal infections, unsafe abortion, hypertension-related disorders of pregnancy such as preeclampsia and eclampsia, and medical complications such as cardiac conditions, HIV/AIDS, or diabetes complicating or complicated by pregnancy.[6] Hence, all the pregnancies need to be evaluated for high-risk pregnancy through routine antenatal care provided by the health-care professionals.

Early identification of high-risk pregnancy, causes, and its complications through quality antenatal care helps in achieving favorable maternal, obstetric, and neonatal outcome.[8,9] In addition, women identified to be at high risk need to be followed up at regular intervals through routine care by the health workers at health facility and home visits to prevent the development of any maternal or fetal complications. Apart from follow-up care, appropriate laboratory investigations and referral services also required to improve the outcome of pregnancy. Prognosis of the outcome also depends on the type of high-risk pregnancy among pregnant mothers.[10] Hence, identification of type of high-risk pregnancy at earliest stage will be useful in directing the appropriate intervention measures for pregnant women.

Although many anecdotal studies have determined the prevalence of high-risk pregnancy in India, fewer studies were done to determine the outcome of high-risk pregnancy in Madhya Pradesh especially in Indore. Hence, the current study was done to determine the prevalence and outcome of high-risk pregnancy and factors associated with it among antenatal women attending the tertiary care Center at MGM medical college & MYH Hospital, Indore.

MATERIAL & METHOD

After approval from the institutional ethical committee the present retrospective study was conducted on all antenatal high-risk patients who visited OPD of Department of Obstetrics & Gynecology at MGM Medical College & MY Hospital, Indore for a period of 1 year i.e., April 2022 to March 2023. The records of the maternal and child health (MCH) register maintained in the antenatal clinic were reviewed. The parameters considered for diagnosis of high-risk pregnancy were also defined as per the guidelines provided by PMSMA.[4]

Inclusion Criteria: All the women suffering from high-risk pregnancy with complete records were included in the study.

Exclusion Criteria: Patients with incomplete records & pregnant women with uneventful pregnancy were excluded from the study.

Method

Data of all antenatal high-risk patients during one year (1st April 2022 to 31st March 2023) was taken from hospital record registers. Each antenatal woman has a comprehensive case record which is updated during every visit by the health care workers. Confidentiality of information for all pregnant women was maintained during the study. The health workers updated the blood pressure during the visit, recent blood investigation reports, and also regarding specific advice given to

pregnant women in that case record. High-risk pregnancy was classified based on the guidelines provided by Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA) for identification of high-risk pregnancy by health-care workers.[4]

Antenatal women with the following conditions were categorized under high-risk pregnancy:

a. Severe anemia with hemoglobin level <7 g/dl
b. Hypertensive disorder in pregnancy blood pressure >140/90mmHg
c. Pregnant women positive for HIV/syphilis
d. Hypothyroidism thyroid-stimulating hormone values – first trimester: 0.1–2.5 mIU/L, second trimester: 0.2–3 mIU/L, and third trimester: 0.3–3 mIU/L
e. Gestational diabetes mellitus glucose challenge test ≥140 mg/dl
f. Twin pregnancy or multiple pregnancy
g. Previous history of lower segment cesarean section
h. Younger primi age <20 years or elderly gravida age >35 years
I. Malpresentation
j. Bad obstetric history of congenital malformation, stillbirth, abortion, premature birth, and obstructed labor
k. Rh incompatibility
l. Low-lying placenta or placenta previa.

Outcome of pregnancy was categorized based on the following domains:

Obstetric outcome

a. Type of delivery – preterm <37 weeks of pregnancy, term 37–42 weeks of pregnancy, and post term delivery >42 weeks of pregnancy
b. Mode of delivery – spontaneous vaginal delivery, assisted vaginal delivery, and lower segment cesarean section.

Neonatal outcome

a. Birth weight of child – low-birth weight baby birth weight <2.5 kg, normal baby birth weight ≥2.5 kg
b. Status of birth – live birth, stillbirth, and abortion.

Statistical Analysis

Statistical analysis was done by SPSS statistical software. Continuous variables, such as age, were summarized as mean standard deviation [SD]. Outcome variables such as high risk pregnancy and outcome of pregnancy were expressed as proportion with 95% confidence interval (CI). Bivariate analysis using Chi square test was done to assess the association of sociodemographic characteristics and outcome of pregnancy with high risk pregnancy. Variables with $P < 0.05$ were considered to be statistically significant.

Result

In this record based study, we reviewed MCH register for the prevalence and outcome of high risk pregnancy among antenatal mothers registered between April 2022 and March 2023. A total of 9211 females were enrolled for the study. Out of these, 1206 were found to be high risk thus making the prevalence of 13.09%. Since 68 records had more missing data, they were removed, and 1138 (94.4%) were included in the final analysis.

The mean (SD) age of the study participants was 25+3.7years. Table 1 describes the sociodemographic characteristics and obstetric index of the study participants. Majority of the pregnant females were in 20-25 years age group i.e.,630 (55.3%) with only 5% was adolescent pregnancy; majority of the pregnant females i.e.,463 (81.4%) belonged to below poverty line families; more than half (662, 58.4%) were multigravida pregnancy; about 612 (57.1%) were multiparous woman. Almost three fourth of the antenatal mothers i.e.,820 (74.3%) registered their current pregnancy within 12 weeks from last menstrual period. Only 6 antenatal women had three or more abortion (recurrent abortions). The prevalence of high risk pregnancy among the study participants was found to be 13.09%.

Major cause for high risk pregnancy was related to maternal age in which 70 (6.2%) belonged to either younger primigravida (age 35 years). Other causes were as follows: 36 (3.1%) had hypertension disorder in pregnancy (≥140/90 mmHg), 22 (1.9%) had gestational diabetes mellitus, 20 (1.7%) had severe anemia, 18 (1.6%) had previous history of lower segment cesarean section, 16 (1.4%) had twin or multiple pregnancy, 16 (1.4%) had hypothyroidism, 12 (1.0%) had Rh incompatibility, and 6 (0.5%) had bad obstetric history.

Table 2 shows the obstetric and neonatal outcome of pregnancy among the study participants. Obstetric outcomes were assessed based on the type and mode of delivery. Majority i.e.,904 (81.9%) had term delivery. Most common mode of delivery was spontaneous vaginal delivery in 74.8% patients followed by lower segment cesarean section i.e.,25.2%. Neonatal outcomes were assessed based on the status of child and birth weight. About 112 (10.4%) gave birth to low birth weight baby and only 20 (1.7%) had stillbirth. (Table 2)

Table 1: Sociodemographic characteristics and obstetric index of the study participants

Sociodemographic and obstetric index	Frequency, n (%)
Age category (years)	
<20	60 (5.3%)
20-25	630 (55.3)
26-30	352 (31.1)
31-35	84 (7.4)
36-40	10 (0.9)
Socioeconomic status	
Below poverty line	926 (81.4)
Above poverty line	212 (18.6)
Gravida (n=1134)	
Primi	472 (41.6)
Multi (2 or more pregnancy)	662 (58.4)
Parity (n=1072)	
Nulliparous	460 (42.9)
Multiparous (parity - 1,2 and 3)	612 (57.1)
Time of registration (n=1104)	
Early (<12 weeks)	820 (74.3)
Late (12 weeks and more)	284 (25.7)
Number of living child (n=1100)	
0	544 (49.4)
1	500 (45.5)
2	56 (5.1)
Abortion (n=1102)	
0	914 (82.9)
1	164 (14.9)
2	18 (1.6
3 or more	6 (0.5)

Table 2: Obstetric and neonatal outcome of pregnancy among antenatal women

Outcome of pregnancy	Frequency, n (%)
Obstetric outcome	
Type of delivery (n=1104)	
Preterm (<37 weeks)	138 (12.5)
Term (37-42 weeks)	904 (81.9)
Postterm (>42)	62 (5.6)
Mode of delivery (n=1080)	
Spontaneous vaginal delivery	798 (73.9)
Lower segment cesarean section	272 (25.2)
Assisted vaginal delivery	10 (0.9)
Neonatal outcome	
Birth weight of the child (kg) (n=539)	
Low (<2.5) 56 (10.4)	112 (10.4)
Normal (≥2.5) 483 (89.6)	966 (89.6)
Status of birth (n=569)	
Live birth	1080 (94.9)
Abortion	38 (33.4)
Stillbirth	20 (1.7)

Table 3: Sociodemographic and obstetric factors associated with high-risk pregnancy among antenatal women

Sociodemographic characteristics and obstetric factors	High-risk pregnancy frequency, n (%)	Prevalence ratio	95% C	P
Socioeconomic status				
Below poverty line	93 (20.1)	1.94	1.07-3.49	0.02

Above poverty line	11 (10.4)	Reference	Reference	-
Gravida (n=567)				
Primi	48 (20.3)	1.20	0.85-1.70	0.29
Multi	56 (16.9)	Reference	Reference	-
Parity (n=536)				
Nulliparous	52 (22.6)	1.41	1.01-2.00	0.05
Multiparous	49 (16.0)	Reference	Reference	-
Time of registration				
Early	77 (18.8)	1.03	0.69-1.53	0.90
Late	26 (18.3)	Reference	Reference	-

Table 4: Association of outcome of pregnancy with high-risk status among antenatal women

	Normal pregnancy frequency, n (%)	High-risk pregnancy frequency, n (%)	χ2	P
Obstetric outcome				
Type of delivery (n=1104)				
Preterm (<37 weeks)	100 (11.0)	38 (19.4)	10.90	0.004
Term (37-42 weeks)	766 (84.4)	138 (70.4)		
Postterm (>42)	42 (4.6)	20 (10.2)		
Mode of delivery (n=1080)				
Spontaneous vaginal delivery	668 (75.4)	130 (67.0)	3.95	0.14
Lower segment cesarean section	212 (23.9)	60 (30.9)		
Assisted vaginal delivery	6 (0.7)	4 (2.1)		
Neonatal outcome				
Birth weight of the child (kg) (n=1078)				
Low (<2.5) 56 (10.4)	76 (8.6)	36 (18.4)	8.19	0.004
Normal (≥2.5) 483 (89.6)	806 (91.4)	160 (81.6)		
Status of birth (n=1138)				
Live birth	886 (95.3)	194 (93.3)	0.70	0.40
Abortion/ Stillbirth	44 (4.7)	14 (6.7)		

DISCUSSION

Recognition and diagnosis of all high-risk factors should be the first step to improve morbidity and prevent mortality of pregnant women. This study was done to determine the factors associated with high-risk pregnancy and its outcome through longitudinal review of case records in a tertiary care health-care center. The prevalence of high-risk pregnancy was found to be 13.09%. Socioeconomic status and parity were found to be independently associated with high-risk pregnancy.

Regarding the outcome of the pregnancy, most of the pregnant women had favorable obstetric and neonatal outcome. However, among obstetric outcome, unfavorable outcome such as preterm and post term delivery was found to be more common among high-risk pregnancy when compared to normal pregnancy and found to be statistically significant.

Similarly, in neonatal outcome, low-birth weight child was more prevalent among high-risk pregnant women and found to be statistically significant. Mode of delivery and status of child were not associated with high-risk pregnancy in the current study.

Studies around India have reported higher proportion of high-risk pregnancy in contrast to current study findings. Studies done by Mehta B et al10, Jadhao AR et al11 & Jaideep KC et al12 in Nagpur, Haryana, and Karnataka respectively have reported that almost one-third of antenatal women had high-risk pregnancy when compared to the current study finding of 13%.10-12 A study conducted by Mufti et al13 found 15% prevalence of high-risk pregnancy in Kashmir. Bharti et al14 found 31.4% of prevalence of high-risk pregnancy at Chiri block (Rohtak). In rural South India, prevalence of high-risk pregnancy was found to be 18.3%.15 More than half (662, 58.4%) were multigravida pregnancy and Majority of the pregnant females were in 20-25 years age group i.e.,630 (55.3%) in the present study. This can be explained on the basis of early age of marriage in Indian women. A rural hospital-based study conducted by Bharti et al16 in 2011-12 in rural Haryana found that 85.3% antenatal women were in the age group of 21-30 years, only 3.4% antenatal women were between 30-34 years and 0.8% women were more than 35 years of age. Sachdeva et al17 found that 17.2% of study women were of more than 30 years of age.

Majority of the high-risk pregnancy in the present study is contributed by maternal age (teenage and elderly pregnancy) followed by pregnancy-induced hypertension (PIH). Studies done by Jadhao AR et al11 in Haryana and Kumar MP et al17 in Dharwad also reported that maternal age-related factor and PIH are major contributing factors for high-risk pregnancy. Parity and socioeconomic status were found to be independently associated with high-risk pregnancy. Similar findings were found in study done by Jaideep KC et al12 in Karnataka. However, we could not assess the other factors influencing the high-risk pregnancy such as education, age at marriage, and age at first pregnancy which were reported by other studies.

Outcome of the pregnancy was also found to be unfavorable among the high-risk cases in the current study, which is comparable to the studies done in other parts of India. Limited evidence available on birth outcomes reported significant association between low-birth weight and high-risk pregnancy which is comparable to the current study finding. A study done by Mehta B et al10 in Nagpur also reported that high-risk pregnancy had significant association with lower segment cesarean section which is contrast to the current study. However, the current study found that preterm and post term delivery is more common among high-risk pregnant women.

Major strength of the study is the use of standard guidelines for the diagnosis of high-risk pregnancy which will help to compare the current study findings across various studies from India. All the records were included in the study which represents the reality of the status of pregnant women in rural setting. The current study adds to the limited literature available regarding outcome of high-risk pregnancy in a primary care setting.

However, the study has its own limitations. Since the study is record based and we relied on the data recorded in the case record, there could be errors in entering the data of the pregnant women by the stakeholders. We could not gather data on various possible factors influencing high-risk pregnancy such as education, employment status, spousal support, age at marriage, and age at first pregnancy. Causal outcome for factors related to high-risk pregnancy and outcomes cannot be inferred as the data on time of exposure cannot be retrieved from the case records. Further cohort studies can be done to focus on factors influencing the high-risk pregnancy and outcome of pregnancy.

High-risk pregnancy can have serious maternal, obstetric, and neonatal complications if left undetected. The Government of India has introduced several schemes for early detection of high-risk pregnancy with recent one being “PMSMA” which aims to provide quality antenatal care for pregnant women throughout the country.

Even though several measures are taken to tackle the problems, frequent monitoring by the relevant stakeholders for success and quality of the schemes needs to be done. This can be done by surveying the reduction in the trend of high-risk pregnancy and increase in the trend of favorable maternal and neonatal outcomes. This can help in improving the quality-of-service delivery and strengthen the interventions already in place.

CONCLUSION

Antenatal surveillance may prevent and treat most of the complications that leads to increased burden of maternal morbidity

and mortality in our country. The most important drawback in our study population is lack of antenatal visit in first trimester. Awareness of first trimester registration has to be increased in our population by various health care professionals. Antenatal women with high risk factors should be advised more frequent visits to hospitals and early admission. Early referral to tertiary care center also plays a very important role in timely management of high-risk pregnant women. Effective communication, early detection and timely management are important tools to minimize the risks to mother and fetus and thus, will contribute a lot for decreasing maternal and perinatal morbidity and mortality.

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