Pregnancy outcome among high-risk pregnant women in the rural area of Belagavi

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ABSTRACT

Background: India has around 25% high-risk pregnant mothers, which leads to about 75% perinatal morbidities. The early prediction of a high-risk pregnancy and planning interventions can help in preventing complications and result in good pregnancy outcomes. Aims: To study the pregnancy outcome among the high-risk pregnant women of a rural area and to associate pregnancy outcomes of high-risk pregnant women with modified Coopland’s criteria. Material and Methods: Study design: 1-year Longitudinal study from 2016 to 2017, Study population: The high-risk pregnant women attending PMSMA camp, Study area: Kinaye, Primary Health Centre, Belagavi. Sample size: 147, Data collection was done using a pretested predesigned questionnaire after obtaining patient consent and ethical clearance. Chi-square test was used to study the association of variables and categorical data presented as percentages. Results: Among the participants, 40.4% of the pregnant women had low-risk scores; 45.9% had high-risk scores, and 13.7% had severe-risk scores according to Coopland’s high-risk pregnancy scoring. Nearly 29.5% high-risk pregnancies resulted in bad fetal outcomes. As Coopland’s score in the high-risk group increased, the chance of having good fetal outcomes decreased, and this association was found to be statistically significant. Conclusions: 70.5% of the high-risk mothers had good pregnancy outcomes. The scoring system can be used by health workers for the prediction of high-risk pregnancy and plan treatment and preventive measures.

Keywords: Belagavi, High risk, PMSMA, pregnancy outcome

Introduction

“High-risk pregnancy (HRP) is defined as one which is complicated by factor or factors that adversely affect the pregnancy outcome (maternal, perinatal or both)” Identification of such pregnancies which lead to poor outcome is the primary aim in antenatal care. A risk scoring system is very useful for the detection of HRP as it often results in a bad maternal and fetal outcome, and extra care should be given, especially in developing countries like India. Early prediction of such a state, severity, and planning interventions can help in preventing complications and thus reduce the maternal and infant mortality rates and the incidence of low birth weight babies. The Ministry of Health and Family Welfare of India launched the Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA) in 2016 to provide quality antenatal care services, free of cost, to all women in their 2nd or 3rd trimesters of pregnancy at certain government health facilities on the 9th of every month. This helps us in identifying and tracking high-risk pregnancies, monthly antenatal checkups by a specialist, and treatment of complicated cases at all the health centres, thereby making the antenatal services more approachable to all the pregnant women in all places, including the remote areas and rural places; thus helping every mother and child to have a safe delivery and healthy life by preventing
Objective of the study are: 1. To study the pregnancy outcome among high-risk pregnant women of a rural area. 2. To associate pregnancy outcomes of high-risk pregnant women with modified Coopland’s criteria.

Materials and Methods

A longitudinal study was conducted for a period of one year from 1st October 2016 to 31st December 2017 at Kinaye Primary Health Centre (PHC), Belagavi district, Karnataka. The study sample consisted of 147 high-risk pregnant women attending the PMSMA camp and was followed up every month till delivery. Inclusion criteria: pregnant women were attending the PMSMA camp at Kinaye rural PHC, with a present or past history of high-risk factors. Ethical clearance for this study was obtained from the Institutional Ethics Committee (Ref. No. MDC/DOME 434; dt. 21/09/2016). Data was collected using a predesigned and pretested questionnaire after taking written informed consent. The study subjects were interviewed, and information regarding the sociodemographic details, past and present obstetric, gynecological, medical, and surgical history was collected. General physical and antenatal examination along with anthropometry and laboratory tests was done on every visit. The patients were counselled and referred to a higher centre whenever needed, and appropriate treatment was prescribed. Coopland’s high-risk scoring for pregnancy was used to group the risk pregnancy according to its severity by adding the values of all the high-risk factors. The predictor variables were reproductive history consisting of age, parity, and previous bad obstetric history, the medical and surgical conditions of the mother, and the present pregnancy complications. The numerical values were assigned to each of the high-risk factors based on their severity. The summed up total score determined whether the pregnancy was “No risk”, “low risk”, or “high risk”, accordingly and was categorized as: Low risk with the score of 0 to 2, High risk with the score of 3 to 6 and Severe risk with the score ≥7. The outcome of pregnancy was assessed on the 8th post-natal day, and the information regarding maternal complications and perinatal morbidity and mortality were noted. Statistical analysis: Data was compiled and analysed using MS Excel and SPSS software (Trial version 22). The statistical test used was Chi-square, and a P value <0.05 was considered significant at a confidence interval of 95%. The categorical variables such as age, sociodemographic details, obstetric details, present and past high-risk characteristics, and their outcomes were all tabulated and expressed as percentages.

Results

The population of the study area was 70,000, the birth rate 20/1000 live birth, and the prevalence rate of HRP 15.0%. So, the expected number of pregnancies and high-risk mothers was 1400 and 210, respectively. But the women attending the monthly PMSMA camps were 147 (10.5%) of the HRP. Therefore, 63 (4.5%) of mothers may be missing the camp. Although the PMSMA camp approach wants to identify HRP as early as possible, 71 (48.3%) of the study participants, when interviewed and examined initially, were in the 3rd trimester, 58 (39.5%) in the 2nd trimester, and 18 (12.2%) in the 1st trimester. The mean ± SD months of amenorrhea was 6 ± 2 months.

The study participants were in the reproductive age group of 16 to 45 years, most of them (89 (60.5%) belonging to 20 to 25 years’ group; 31 (21.1%) in the age group of 26 to 29 years, >30 years were 17 (11.6%) pregnant women and ≤19 years were 10 (6.8%). The mean ± SD age of pregnant women was 24 ± 4 years. About 5 (3.4%) of the study participants had child marriage, and most of them 100 (68.0%) had their 1st pregnancy in the age group of 20 to 25 years. The mean ± SD age at marriage and first pregnancy was 20 ± 2 years and 21.4 ± 2 years, respectively. Nearly 34 (23.1%) study subjects were pregnant for the first time with age <19 years, and one (0.7%) of the participant was the elderly primigravida. The pregnant women had attained their menarche between 12 to 17 years of age, and most 99 (67.3%) of them, at 13 years of age. The mean ± SD age of menarche was 13 ± 1 years. The majority of the pregnant women (132 (89.8%)) belonged to the Hindu religion, and 15 (10.2%) followed the Muslim religion. Most of them (82 (55.8%)) lived in a joint family, and 65 (44.2%) of the women belonged to nuclear families. The family size was >4 members for 77 (52.4%) mothers. The socioeconomic status according to modified BG Prasad classification, 49 (33.4%) of the study participant belonged to class IV, 44 (29.9%) to class III,
According to the Asian population cut off values for Body Mass Index (BMI), 70 (47.6%) of the women had normal BMI, though 17 (11.6%) were underweight; 25 (17.0%) overweight, 28 (19.0%) preobese, and 7 (4.8%) of the study participants were obese. Nearly 52 (35.4%) of pregnant women were primigravida, and 5 (3.5%) were grand multigravida. Around 47 (31.9%) were second gravida; 24 (16.3%) were third gravida, and 19 (12.9%) were fourth gravida. With regards to parity among multigravida, 57 (60%) were para one; 23 (24.2%) para two; 13 (13.7%) para three; and 1 (1.1%) each were para four and five. Around 25 (17.0%) pregnant women had a previous history of abortion; among them, 20 (80.0%) had a history of one abortion; 5 (12.0%) had two abortions, 1 (4.0%) each had a history of three and four abortions. In relation to living children, 50 (64.1%) of them had one child; 18 (23.1%) had two children; and 10 (12.8%) of them had three children. Nearly 22 (14.9%) of the pregnant women had a previous history of neonatal or child death; among them, 19 (86.4%) of the mothers had a history of one child death, and 3 (13.6%) of them had three child or neonatal deaths.

Regarding anaemia, 8 (5.4%) of the pregnant women had severe anaemia with haemoglobin value less than 8 g/dl, 66 (44.9%) of them had mild to moderate anaemia with a haemoglobin level between 8.1 to 10.9 g/dl and 73 (49.7%) of the mothers had normal haemoglobin level ≥11 g/dl. The prevalence of anaemia in our study was 50.3%. Neither of the participants was reactive for Human Immuno-Deficiency Virus infection, nor were they positive for surface antigen. None of them had their random blood sugar level outside the normal range. Peripheral smear for malarial parasite was negative among all the mothers. With regards to blood group and Rh typing, 127 (86.4%) were Rh positive, and 20 (13.6%) were Rh negative. The main blood group noted in our study was O 58 (39.5%), followed by A 41 (27.9%), B 33 (22.4%), and least being AB group in 15 (10.2%) mothers. About 4 (2.7%) of the mothers had an abnormal thyroid test in the present pregnancy; another four pregnant women known cases of thyroid disorders and under treatment. None of the mothers required a chest X-ray/CT scan. Ultrasonography was found to have abnormal findings among 8 (5.4%) of the mothers. The findings were: congenital anomaly, malpresentation, placenta previa, and amniotic abnormally. Only one (0.7%) mother required additional investigation of toxoplasmosis, rubella cytomegalovirus, herpes simplex, and HIV infections (TORCH) and was positive for it.

Out of the 147 mothers studied, 71 (48.3%) and 76 (51.7%) had high-risk characteristics during the present and past pregnancy, respectively. Among them, 37 (32.7%) had a risk factor in the present pregnancy only, 42 (37.2%) in the past pregnancy only, and 34 (30.1%) mothers in both pregnancies. In the present pregnancy, 82 (55.8%) risk factors were contributed from 71 study subjects, and 11 (15.5%) of them had two risk characteristics [Table 1].

Similarly, in the past pregnancy, 102 (69.4%) risk factors were contributed from 76 study participants, and 23 (30.3%) of them had ≥2 risk characteristics [Table 2].

| Characteristic                     | Number | Percentage |
|-----------------------------------|--------|------------|
| Rh negative pregnancy             | 20     | 24.4       |
| Teenage pregnancy                 | 10     | 12.2       |
| Short stature                     | 9      | 10.9       |
| Severe Anemia                     | 8      | 9.8        |
| Pregnancy induced Hypertension    | 7      | 8.6        |
| Obesity                           | 7      | 8.6        |
| Grand Multigravida                | 5      | 6.1        |
| Thyroid disorder                  | 4      | 4.9        |
| Twin pregnancy                    | 3      | 3.7        |
| Polyhydramnios                    | 2      | 2.4        |
| Oligohydramnios                   | 2      | 2.4        |
| Congenital fetal anomaly          | 2      | 2.4        |
| Breach presentation               | 1      | 1.2        |
| Antepartum hemorrhage             | 1      | 1.2        |
| Elderly primigravida              | 1      | 1.2        |
| Total                             | 82*    | 55.8       |

*multiple response

| Characteristic                     | Number | Percentage |
|-----------------------------------|--------|------------|
| Previous caesarean                | 30     | 29.4       |
| Previous h/o abortion             | 25     | 24.5       |
| Previous h/o neonatal or child death | 22   | 21.6       |
| Renal disorder                    | 4      | 3.9        |
| Previous gynae surgery            | 3      | 2.9        |
| Previous Pregnancy Induced Hypertension | 3   | 2.9        |
| Known case of hypothyroidism      | 3      | 2.9        |
| Known case of hypothyroidism      | 1      | 0.9        |
| h/o Congenital fetal anomaly      | 2      | 1.9        |
| Heart disease                     | 1      | 0.9        |
| h/o Sexual Transmitted Infection  | 1      | 0.9        |
| Previous Twin pregnancy           | 1      | 0.9        |
| Previous malpresentation          | 1      | 0.9        |
| Thalassemia                       | 1      | 0.9        |
| Lung disease                      | 1      | 0.9        |
| Allergic illness                  | 1      | 0.9        |
| Previous Postpartum Hemorrhage    | 1      | 0.9        |
| Previous Premature Rupture of Membrane | 1  | 0.9        |
| Total                             | 102*   | 69.4       |

*multiple response
Regarding pregnancy outcome, there were total of 145 newborns (three abortions and two twin deliveries), among whom 77 (53.1%) were male, and 68 (46.9%) were female. The mode of delivery was normal vaginal for 95 (65.1%) pregnant women and Cesarean for 51 (34.9%). Most (93 (63.7%)) of the mothers preferred private hospitals for delivery, whereas 52 (35.6%) preferred Government hospitals, and one (0.7%) of them had home delivery.

Comparison of pregnancy outcome, 103 (70.5%) of the high risk pregnancies had good a fetal outcome, and 43 (29.5%) had bad outcomes.

Full-term vaginal delivery with single live birth with an immediate cry and normal weight, without complications was considered a good outcome. There were 43 total bad fetal outcomes as shown in Figure 2.

The majority of the good fetal outcomes (48 (81.4%)) were seen in the low-risk group, followed by the high-risk 44 (65.7%). The association between the pregnancy risk group and the fetal outcome was found to be statistically significant ($P = 0.04$). [Table 3]

Various steps were taken by the health workers to identify at-risk pregnant mothers and provide timely, adequate treatment affecting the overall pregnancy outcome. Some of the preventive practices are as shown in Figure 3.

### Discussion

In the present study, the majority (81.6%) of the mothers were in the age group of 20 to 29 years, <19 years were 6.8%, 1 (0.7%) of the participant was the elderly primigravida. In a similar study conducted in central India, among 415 women, the majority of the mothers were in the age group of 19 to 34 years (97.4%), while the remaining 2.6% were in the age group of <18 or >35 years.[1] In another study done in Nagpur, 141 (65.89%) were in the age group of 21 to 25 years, and 14 (6.54%) were teenagers.[5] In our study, 3.4% of the study participants had child marriage, and nearly 23% of the mothers were aged below 19 years at the time of the 1st pregnancy. In a similar study of Belagavi, more than 50% of the participants had child marriage, and 27% of their age at first pregnancy was <19 years.[1] According to the National Family Health Survey (NFHS) 4 (2015-2016), 26.8% of the women population have child marriage, and 7.9% of the pregnancies are <19 years.[6] In this study, 33.4% of the study participant belonged to the class IV socioeconomic status, followed by 29.9% class III, and only 2.7% belonged to the class I, whereas in another study conducted in Kinaye, about 40% belonged to IV socioeconomic class followed by III 39.66%, and least belonged to class I 3.66%, according to modified B.G. Prasad's classification[1] In the present study, around 97.3% of the mothers were literate. A similar study done in a rural area of Nagpur showed that (96.73%) were literate.[5]

In our study, 47.6% of the women had a normal BMI, 17 (11.6%) were underweight, 25 (17.0%) overweight, 28 (19.0%) preobese,

### Table 3: Coopland’s risk scoring and pregnancy outcome

| Risk group | Bad outcome | Good outcome | Total |
|------------|-------------|--------------|-------|
| Low        | 11 (18.6%)  | 48 (81.4%)   | 59 (100%) |
| High       | 23 (34.3%)  | 44 (65.7%)   | 67 (100%) |
| Severe     | 9 (45.0%)   | 11 (55.0%)   | 20 (100%) |
| Total      | 43 (29.5%)  | 103 (70.5%)  | 146 (100%) |

*Chi-square: χ²=6.4106, df=2, P=0.04

[Figure 1: Distribution of mothers based on modified Coopland’s high risk pregnancy scoring]

[Figure 2: Distribution of newborns based on bad pregnancy outcome]

[Figure 3: Preventive practies by Health care workers using Coopland’s criteria for High risk pregnant mothers]
and 7 (4.8%) of the study participants were obese.[8] According to the NFHS 4, 22.9% of the women are underweight with BMI <18.5 kg/m², and 20.7% of them are overweight, preobese, and obese with BMI >25 kg/m². In the present study, 52 (35.4%) of the women were primigravida compared to another study which consisted of 110 (51.4%) primigravida.[9] Most of the high risk participants had more than one contributing high risk factor, as high risk pregnancy is multifactorial. The leading risk factors noted in the present pregnancy were: 20 (24.4%) Rh negative pregnancy; 10 (12.2%) teenage pregnancy; 9 (10.9%) short stature; 8 (9.8%) severe anemia; 7 (8.6%) each pregnancy-induced hypertension and obesity; 5 (6.1%) grand multigravida. Risk factors of the past pregnancy known to affect the fetal outcome noted were: previous caesarean section in 30 (29.4%); 25 (24.5%) with a history of abortion; 22 (21.6%) with a history of neonatal or child death; 4 (3.9%) each with renal and thyroid disorders. The most important risk factors were bad obstetric history (75.5%) and underlying medical illness (12.2%).

In another Belagavi study, out of the 30.7% high-risk pregnancy cases, 59.8% had bad obstetric history, 4% had pregnancy-induced hypertension, 5.5% were elderly primigravida, 3.2% were Rh negative, and 22.3% had other risk factors.[10] Another south Indian study revealed pregnancy-induced hypertension (16.6%), anaemia (9.6%), and incidence of medical disease (10.3%) as major causes for high-risk pregnancy.[11] In Nagpur rural study, history of caesarean section 31 (14.4%), malpresentation 17 (7.94%), teenage pregnancy 14 (6.54%); pregnancy-induced hypertension, oligohydramnios, height less than or equal to 140 cm and weight less than or equal to 40 kg (2.80%) each and history of stillbirth and associated diseases was 4 (1.87%) each. Gestational diabetes, age more than 30 years in primigravida, history of congenital anomalies, prolonged pregnancy, and history of more than or equal to two abortions was 2 (0.93%) each. The sistory of ectopic pregnancy and severe anemia was one each (0.47%).[12] Around 7 to 10% of the general population have Rh negative blood group.[13]

In the present study, 45.9% of the pregnant women had high-risk scores; 40.4% low-risk scores, and 13.7% had severe-risk of adverse pregnancy outcomes, according to Coopland’s high risk pregnancy scoring. Among 146 pregnant women, 70.5% of the high-risk pregnancies had good outcomes, and 29.5% had bad fetal outcomes. Most of the good outcomes (81.4%) were mainly seen in the low-risk group and in the high-risk group 65.7%. The bad fetal outcome was seen more among the high risk group 45.0% and least in the low-risk group (18.6%). In a similar prospective study done among 415 pregnant women of central India, 59% of them had high risk, 46% had low risk, and 31% had no risk. In the high-risk group, perinatal deaths were 59 with a high perinatal mortality rate (614 per 1000 live births).[14]

In another study conducted at Khammam, the incidence of perinatal morbidity and all the perinatal deaths (4 cases) occurred in the high-risk group, with none in low-risk group that showed an association of increased perinatal mortality with an increased maternal high-risk score.[9] Another Belagavi study done among 428 mothers using Coopland’s criteria showed that 40.2% had high risk and 59.8% cases were low risk. None of the women were of the extreme risk category. The most commonly reported risk factors were thyroid disorders (27.3%), hypothyroidism 17.3%; hyperthyroidism 10%, gestational diabetes (16.1%), bad obstetric history (12.6%), and anaemia (10.7%).[15] Similar were results of Jain S et al.[16] study, that showed low-risk group mothers had a 50% lower incidence of high-risk neonates (41.3%) when compared to high-risk group mothers, who had 84.4% of high-risk neonates. In a Nagpur rural study, there were 142 (66.3%) study subjects with low-risk pregnancy, and the prevalence of high-risk pregnancy observed was 33.64% and was significantly associated with caesarean section and low birth weight.[17]

A similar Pokhara study among 700 participants using modified high-risk scoring method showed 67.3% of mothers in low-risk, 20% in high-risk, and 12.7% of them in severe high-risk groups and showed that identifying high-risk pregnancy using a scoring system is useful to identify women at risk of developing maternal and perinatal complications as caesarean deliveries, maternal complications, low birth weight, and NICU admissions were mostly seen in severe high-risk (60%) and high-risk pregnancies (26%) than in low-risk pregnancies (15%).[18]

A Nepal hospital-based prospective cohort study done among 346 participants using the Malaysian antenatal risk stratification approach based on maternal high-risk pregnancy factors using four colour codes (red and yellow) high-risk, and (green and white) low-risk showed that the prevalence of high-risk pregnancies was 14.4%.(red 7.5%, 6.9% yellow, 72% green, 13.6% white). The WHO criterion was used for women with severe maternal morbidities, and it was found that the high risk pregnant women were 4.2 times at risk of developing severe maternal morbidities as compared to low-risk pregnant women. This risk scoring approach showed its benefits of detecting severe maternal complications if implemented in antenatal care services routinely for screening.[19]

A retrospective Saudi Arabian cohort study of 533 pregnant women using a similar scoring system showed that their risk scores were 55.9% low, 34.7% moderate, and 9.4% high. Maternal and neonatal complications were significantly increased in high-risk mothers, which suggested the use of a risk assessment method to prevent adverse pregnancy outcomes by early detection and treatment of HRP.[20]

The present study showed that the general health workers’ practices such as supplementation of folic acid, iron, calcium during the regular checkup at ANC visits of the HRP mothers and early ANC registration have probably ensured good pregnancy outcome by preventing adverse outcomes in the study area, as seen in another Canadian (KAP) study that emphasises the physician’s role in promoting folic acid intake to prevent adverse pregnancy outcome.[21]
Due to post-covid digitalisation of healthcare services, the Coopland's criteria can also be conveniently used on similar lines as seen in another Pregnancy induced hypertension (PIH)-related recent qualitative study conducted in the Netherlands to assess the doctor-patient relationship.[14]

A New York study conducted among physicians showed that the need for intentional pregnancy screening, especially of contraception and preconception care counselling at the primary care level, is of utmost importance, which supports our study’s purpose.[15]

**Conclusion**

The major past HRP characteristics were Caesaran section and bad obstetric history, whereas surprisingly, the present HRP mainly were Rh negative and teenage pregnancies, followed by anaemia and PIH. The study of pregnancy outcomes among HRP women in rural Belagavi was found to be good among 103 (70.5%) and bad among 43 (29.5%) mothers. Coopland’s high-risk pregnancy scoring used as a screening tool to predict the HRP outcome showed that 40.4% of the pregnant women had low-risk scores; 45.9% had high-risk scores, and 13.7% had severe-risk scores. The overall mean ± SD Coopland’s pregnancy score was 3.5 ± 2.3 among our study population. The low-risk group showed 80% good outcomes compared to 45% bad outcomes among severe-risk mothers. As Coopland’s score in the high-risk group increased, the chance of having a good fetal outcome decreased, and this association between HRP outcome with modified Coopland’s criteria was found to be statistically significant. This study helps to identify HRP by health workers in the community and to predict adverse outcomes and take necessary actions to prevent them from progressing into the severe category. The low-risk cases may end up with bad outcomes if not taken care of properly, though the good outcome is more than the bad, the severe-risk cases had almost the same bad outcomes as those of low risk. This shows that early detection and proper treatment of HRP will prevent adverse outcomes in the risk group. The scoring system can be used by health workers/general practitioners, especially at the periphery where obstetricians may not be available, and appropriate interventions can be planned depending on the area of study. The current practices of early Antenatal care (ANC) registration (1.5 to 5 months) and regular ANC visits (2 to 6) along with regular medicine consumption of iron, calcium, and folic acid has helped to ensure adequate care to all HRP, thus resulting in overall good pregnancy outcome (70.5%) in the study area.

**Recommendation**

This study is of Public health importance as it helps us to prevent bad pregnancy outcomes and take necessary precautions among high-risk pregnant women by early detection of adverse outcomes. It helps us to know the functioning of the PMSMA camps in the region of it and the knowledge, attitude, and utilization of the National Health Programmes. The scoring system is a very simple, cost-effective, and non-invasive tool to help many pregnant mothers and can be used not only for high risk but all pregnant mothers. Nowadays in this digitalised world, the Coopland’s screening tool also can be used in patient’s mobile, thereby utilising technology (as seen in other studies) wherein the patient and caregiver both save time, maintain privacy, and become aware of the HRP status as well as enhance pregnancy outcome prediction and thus further reducing the complications, cost of treatment and help community effectively.[14]

**Limitation of the study**

The study included all the high-risk pregnant women attending the PMSMA camps in the entire rural area (9 subcentres), which forms a small percentage of the population, and thereby the generalization of the results to the entire population could be a limitation.

**Relevance of the study**

This study adds to the current knowledge regarding high-risk pregnancy adverse outcome prevalence in a rural setup, health-seeking behaviour (PMSMA), treatment facilities in Primary health centre (PHCs), the role of health workers in early identification, prevention of high-risk pregnancy complications using a simple tool such as the modified Coopland’s criteria so that appropriate interventions can be planned accordingly. The Belagavi study area has many Rh negative, teenage pregnancies compared to usual anaemia and PIH HRP, which needs to be tackled and has a great scope for future research pertaining to the association of various high-risk characteristics with the sociodemographic details, fetal outcome, which can enhance the prediction use of the screening tool as well as preventive practices used by the area-specific general practitioner and help the entire community. Coopland’s criterion is easy to train the health workers and thereby utilise their services easily to identify HRP and prevent bad outcomes in rural areas. The study is thus relevant to the practice of primary care physicians as they are the first point of contact with any patient in an emergency (especially obstetrics) and usually know all the family medical history of a particular area and can help in timely treatment and referral to the concerned specialist only with a cost-effective screening tool. Now they can also use it conveniently with digitalisation of healthcare.

**Key message**

Early detection and treatment of high-risk pregnancy prevents adverse outcomes which are determined by the prevalence of present and past pregnancy high-risk characteristics. The modified Coopland’s risk scoring system can be used as a simple and cost-effective screening tool for identifying high-risk pregnancies by easily training the general health workers at the periphery to predict the pregnancy outcome (which has a strong association statistically) and take appropriate planned interventions accordingly, using the knowledge from this study.

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Nil.
Conflicts of interest

There are no conflicts of interest.

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