

Risks a Mother Takes to Give Birth - A Cross-Sectional Study of High-Risk Pregnancies and Preparedness of Public Health Facilities in Rural Karnataka

Soniya Navroj Rupani¹, Srujan Goud Janagam²

ABSTRACT

Introduction: The world's second most populous country—India, witnesses 20-30% pregnancies that belong to the high-risk category out of the total pregnancies in the country. 12% of the global maternal deaths are attributed to India. The Rural areas of the country are further vulnerable to high maternal and infant mortality rates due to a rural-urban divide and unavailability of health resources. **Objectives:** The rationale of this paper is to understand and illustrate common High Risk Pregnancies (HRPs) in the rural area of Shorapur and to gauge the preparedness of the health facility in the area to help deliver safe child birth for the mother and the child. **Materials and Methods:** A cross-sectional study was conducted in pregnant women attending the Antenatal Care (ANC) clinic in sub-district hospital of northern Karnataka over a period of 03 months. **Results:** A total of 601 high risk conditions were identified in ANC women. Of the total ANC women with HRP 44.1% ($n=265$) had previous Caesarean Section, 15.1% ($n=91$) had RH incompatibility, 12.6% ($n=76$) were observed to be Short Primi, 9.7% ($n=58$) experienced Bad Obstetric History/Antepartum Haemorrhage, 8.2% ($n=49$) had Gestational Hypertension, 5.8% ($n=35$), were severely Anaemic, 4.2% ($n=25$) had Multiple pregnancy and the remaining 0.3% ($n=3$) had tumour, Gestational DM and Rheumatoid Arthritis. **Discussion:** As per the observed HRPs and respective health facility preparedness, two main barriers to safe pregnancy and childbirth emanated during the study - inadequate infrastructure and services for blood transfusion, dearth of trained health professionals. **Conclusion:** Direct referral of high risk cases to appropriate facilities that have the required capacity to support such cases must be made. Tele-medicine can be considered as an efficient alternative to connect the ANC women with the specialist doctor remotely for evaluation of HRPs. A blood storage unit must be established in all SDH hospitals as a minimum requirement.

Key words: High Risk Pregnancy, Antenatal Care, Maternal Mortality Rate, Maternal Health, Health Facility Preparedness.

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INTRODUCTION

Every day 810 women die due to complications during pregnancy and childbirth across the world. India contributes to 12% of the maternal deaths and 23 % of the infant deaths worldwide.¹ When a pregnant woman or her foetus or both are at a risk of developing complications during the antepartum period or delivery then such pregnancies are referred to as High Risk Pregnancies (HRPs). In India about 20-30% pregnancies belong to the high-risk category, which contribute for 75% of perinatal morbidity and mortality.² Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR) are declining in India, but the pace is not in line with the Millennium Development Goals 4 and 5.³ India has pledged to the latest United Nations (UN) target for the Sustainable Development Goals (SDGs) to reduce MMR from 130 per 1,00,000 to 70 per 1,00,000 live births by 2030.⁴

The challenge the country faces to achieve the SDG goals is twofold, on one hand there is shortage of specialist doctors in rural areas and on the other

hand there is lack of infrastructure and equipment.⁵ To achieve committed target of reduction in MMR for meeting SDGs the early identification of HRPs and their effective management is essential especially in rural areas where emergency medical services are usually far away.⁶ Early detection and effective management of high-risk pregnancy can contribute substantially to reduction of maternal and foetal adverse outcomes.⁷ Haemorrhage and Anaemia are major reasons for maternal mortality and morbidity along with maternal infections, unsafe abortion, hypertension-related disorders.⁸

To facilitate the early identification of high-risk pregnancies, the government of Karnataka introduced HRP factors in Thai cards. Thai card is a maternal and child protection card devised to track and manage pregnancies. In this paper we are focusing on the early identification of High-Risk Pregnancies, their prevalence and healthcare services available for their management.

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MATERIALS AND METHODS

A cross sectional study was conducted in pregnant women attending the Antenatal Care (ANC) clinic in sub-district hospital of northern Karnataka. Study questionnaire was prepared based on the high-risk pregnancy conditions mentioned in the mother and child protection card - Thai Card. Convenient sampling technique was used and the questionnaire was administered among 509 pregnant women attending the ANC clinic over a period of 3 months from August to October 2017. The purpose of the study and the research agenda was explained to the women to obtain a written consent from the participants. Only women who provided oral and written consent were surveyed. Confidential information was maintained by using de-identified data. The availability/non-availability of blood bank at Sub District Hospital (SDH) was noted by means of observation.

Women carrying Thai cards, with designated high-risk pregnancy factors indicated in the Thai card were included in the study. The collected data was cross-checked for data accuracy with the HRP factors mentioned in Thai card. The following HRP conditions were noted as per Thai card.⁹

1. Short Primigravida or maternal short stature increases the risk of obstetric complications such as Cephalopelvic Disproportion, arrest of labor, higher rates of Caesarean Sections, Intrauterine Asphyxia, Intrauterine Growth Restriction (IUGR) and low APGAR (Appearance, Pulse, Grimace, Activity and Respiration) scores.
2. Severe Anaemia can lead to serious maternal and foetal complications. Maternal complications of severe anaemia include Cardiac failure, susceptibility to infections, preterm labour, Post-Partum Haemorrhage (PPH), sub-involution, failing lactation and foetal complications including Prematurity, IUGR and Anaemia of new-born.
3. Pregnancy Induced hypertension/Pre-Eclampsia can result in Haemolysis, Elevated Liver Enzymes and Low Platelet count (HELLP) Syndrome, Acute Respiratory Distress Syndrome (ARDS), Renal Failure, pulmonary Edema, Disseminated Intravascular Coagulation (DIC) and foetal complications including IUGR, Intrauterine Death (IUD), Foetal Distress, Prematurity.
4. Previous Lower Segment Caesarean Section (LSCS) Pregnant women with prior Caesarean Section are at higher risk of uterine rupture which poses considerable risk of adverse maternal and perinatal outcomes
5. Multiple pregnancy can present maternal complications that include Anaemia, Hyperemesis, early onset Preterm Pre-Eclampsia, Acute Hydramnios, Atonic PPH, increased risk of operative delivery. Foetal complications including Prematurity, IUGR/IUD, congenital anomalies, malpresentations, Prelabour Rupture of Membranes (PROM), chord prolapse, Placenta Previa, placental insufficiency, twin to twin transfusion, stuck or conjoint twin.
6. Antepartum Haemorrhage is an important cause of perinatal mortality and maternal morbidity
7. Rh incompatibility can cause Haemolytic Anaemia in the baby
8. Pregnancy with tumours, Pregnancy with heart disease/Diabetes. Pregnant women with Gestational Diabetes Mellitus (GDM) are at an increased risk for foetal death in-utero and this risk is increased in pregnant women requiring medical management.¹⁰ Of these HRP conditions, Mal presentations, IUR were excluded as there was no diagnostic investigations available to identify the same in the government hospital.

Operational definition

- Short Primigravida: Pregnant women with height less than 140 cm were considered as Short Primigravida
- Anaemia: Haemoglobin levels less than 7 gm/dl were considered as severe Anaemia
- Pregnancy induced hypertension (PIH)/Preeclampsia: High Blood Pressure greater than 140 mmhg during pregnancy was considered as PIH
- Previous Caesarean Section: Pregnant women who had previously undergone one or more Lower Segment Caesarean Section (LSCS).
- Multiple Pregnancy: Pregnant women with more than one foetus were considered as multiple pregnancy
- Antepartum Haemorrhage: Bleeding from or in to the genital tract, occurring from 24+0 weeks of pregnancy and prior to the birth of the baby was considered as Antepartum Haemorrhage.
- Rh incompatibility: A condition where pregnant woman had Rh-negative blood and the baby in her womb had Rh-positive blood was considered as Rh incompatibility
- Pregnancy with tumours and Pregnancy with heart diseases/diabetes: ANC women with existing tumors or heart disease and raised sugar levels during pregnancy.

RESULTS

A total of 509 high risk pregnant women were surveyed in the study through questionnaire and cross referencing with Thai card. (Figure 2 and 3) The average age of the pregnant women who participated in the study was 24 years. 52% ANC women in the study population had no prior education and were unable to read and write while 48% were literate. 21.6% ($n=110$) of the ANC were primigravida while the 78.2% ($n=368$) were multigravida and among the multigravida it was observed that 6% ($n=31$) were Grand multipara. (Table 1)

Among the 509 pregnant women 601 HRP conditions were identified. 54 ANC women were identified with more than 1 HRP condition. Of the total pregnant women with HRP, 44.1% ($n= 265$) had previous Caesarean Section, 15.1% ($n=91$) had RH incompatibility, 12.6% ($n=76$) were observed to have Short Primi, 9.7% ($n=58$) has experienced Bad Obstetric History/Antepartum Haemorrhage, 8.2% ($n=49$) had Gestational Hypertension, 5.8% ($n=35$), were severely anaemic, 4.2% ($n= 25$) had Multiple pregnancy and the remaining 0.3% ($n=3$) were tumour, GDM and Rheumatoid arthritis. (Figure 1)

DISCUSSION

The most common HRP condition was previous LSCS contributing to 44.1% of the ANC in study population. As mentioned, this condition could result in maternal mortality and morbidity and requires delivery at Comprehensive Emergency Obstetric Care (CEmOC) facility that is equipped with blood storage unit, for blood transfusion as mandated by the government of India. In the study 5.8% of the pregnant women were severely Anaemic and their delivery required the First Referral Unit (FRU) to be equipped with blood transfusion facilities and blood storage unit. In India anaemia contributes to 16% of the total maternal deaths.¹¹ A total of 50% ($n=254$) (Figure 1) of the ANC women in the study population required a FRU that had blood transfusion facilities to deliver their babies. It was observed (Table 2) that, at the time of study, the FRU did not have blood bank or blood storage unit. Rural areas in India are at a similar condition in terms of unavailability of blood transfusion facilities. There are more than 6000 facilities such as District Hospital (DH), Sub-District Hospital (SDH) and Community Health

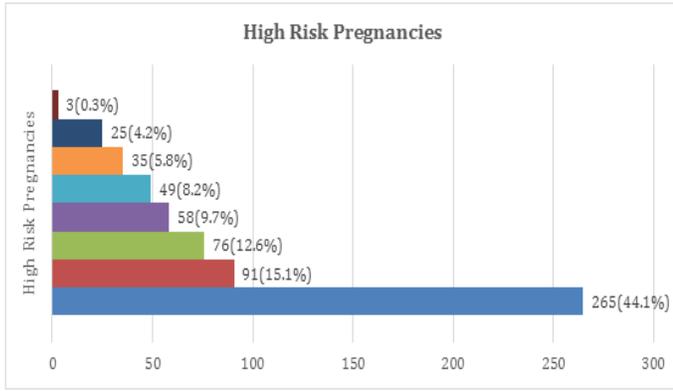


Figure 1: Distribution of High-Risk Pregnancy factors among ANC visiting ANC clinic.



Figure 2: ANC clinic.



Figure 3: Data Collection.

Centre (CHC) present across India, excluding medical colleges and more than 80% of these facilities lack blood storage facilities.¹²

In India the health sector has made outstanding accomplishments in the past few decades, but it has not reflected sufficiently to fulfil the country’s objective on blood transfusion facilities that address the major maternal health high risk pregnancies of Anaemia and LSCS. Blood transfusion as a treatment modality for postpartum haemorrhage and severe anaemia is well-known but still more than one-third of maternal death is due to these conditions in India and the situation of rural India is even worse.¹³ Strengthening of these facilities by equipping with blood storage units would significantly decrease the HRP and increase the qualitative antenatal care.

Table 1: Characteristics of age, literacy and parity of ANC in the study population.

Age of the pregnant women		
Age	No. of HRP Women	Percentage
<20 years	25	8%
20-30 years	471	86.50%
>30 years	13	5.10%
Literacy rate of Pregnant women		
Literacy Status	No. of HRP Women	Percentage
Literate	265	52%
Illiterate	244	48%
Gravida of Pregnant women		
Pregnancy Category	No. of HRP Women	Percentage
Gravida Primi (Single Pregnancy)	110	21.6%
Multigravida (Less than 4 pregnancies)	368	72.2%
Multigravida (>4 pregnancies)	31	06%

Table 2: Availability of essential Maternal healthcare services at Sub District Hospital.

Essential services for HRP identification and Management as per IPHS standards	Mandatory positions as per IPHS standard	Available at the SDH/ FRU
OBGYN	1	0
Radiologist	1	0
Blood storage unit	1	0
USG	1	0

The results from Figure 1 shows that 15.1% of the pregnant women had found to be RH compatible and require RH immunoglobulin for treatment.¹⁴ It was observed that the Sub District hospital and the PHCs are having the RH immunoglobulins to treat the RH incompatibility. All the HRP conditions need frequent antenatal visits and specialist antenatal and postnatal care but the dearth of trained professionals in the rural areas is impeding the pace to achieve the goals of MMR and IMR. In India as of 2019, out of total 29799 PHCs, 9.6% were operating without a doctor and the remaining facilities where doctors are present their availability remain questionable due to high absenteeism. In rural India 64% of the community health centres lack obstetricians and gynaecologists to provide maternal healthcare services and 25.3% of the doctors’ posts are vacant at the PHCs.¹⁵ An important aspect of obstetric care is the management of High-Risk Pregnancies and the shortage of healthcare professionals in rural areas is denying 20-30% of the high-risk pregnant women a safe delivery.

CONCLUSION

India has made significant progress in addressing maternal mortality and morbidity in the past few decades. However, there are structural and operational challenges that exist in management of High Risk Pregnancies, especially in rural areas. Although the government has introduced several programs that lead to early identification of HRP, management of HRP is hindered by three main factors in context of this paper. First is availability of health facilities equipped with blood

transfusion and storage capacity. Second is continued availability of trained doctors and staff to support such pregnancies. Finally, direct referral of high risk cases to appropriate facilities that have the required capacity to support such cases.

Addressing early identification of HRPs, ensuring availability of blood banks and storage units, continued support of trained specialist staff for HRP management at the facility and appropriate direct referrals have been a challenge owing to lack of amenities in rural areas.

A blood storage unit must be established in all SDH hospitals as a minimum requirement. Relevant blood type must be made available for assigned HRP delivery as per their expected delivery dates proactively.

Tele-medicine can be considered as an efficient alternative to connect the HRP cases with the specialist doctor remotely. This can bridge the gap of dearth of specialists at the facility.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ABBREVIATIONS

ANC: Antenatal Care; **APGAR:** Appearance, Pulse, Grimace, Activity and Respiration; **CeMO:** Comprehensive Emergency Obstetric Care **CHC:** Community Health Centre; **DH:** District Hospital; **DIC:** Disseminated Intravascular Coagulation; **GDM:** Gestational Diabetes Mellitus; **HELPP Syndrome:** Hemolysis, Elevated Liver Enzymes and Low Platelet Count; **HRPs:** High Risk Pregnancies; **IMR:** Infant Mortality Rate; **IUD:** Intrauterine Death; **LSCS:** Lower Segment Caesarean Section; **MMR:** Maternal Mortality Rate; **PET:** Preterm Pre-Eclampsia; **PIH:** Pregnancy induced hypertension; **SDGs:** Sustainable Development Goals; **SDH:** Sub District Hospital.

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