Case Report

DOI: http://dx.doi.org/10.18203/2394-6040.ijcmph20204389

Early identification of high-risk pregnancies in rural areas of Karnataka through maternal obstetric monitoring program

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Received: 07 September 2020 **Revised:** 18 September 2020 **Accepted:** 21 September 2020

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ABSTRACT

Maternal mortality rate (MMR) has been one of India's key priority areas. Over the years, several national programs have addressed issues of accessibility and affordability of antenatal care. Major gaps in the system include shortage of trained human resource and technological infrastructure in providing essential diagnostic ante-natal care. High risk pregnancies (HRP) owing to various factors, account for 70-80% of maternal deaths. This case study describes the clinical and workflow process innovation in ante-natal care in Shorapur taluka, a rural region of Northern Karnataka. Maternal obstetric monitoring (MOM) through a defined protocol for high-risk pregnancy identification aided by ultrasound scans, was introduced at the sub-district hospital. In parallel, system strengthening was done through capacity building activities, installation of blood storage unit and provision of ultrasound services. The model demonstrates that process and technological innovations can be leveraged on to facilitate and make available specialist medical services in rural areas, which is key to identification and timely management of high-risk pregnancies.

Keywords: High risk pregnancies, Technology, Ultrasonography, Maternal mortality rate

INTRODUCTION

In rural India it was reported that as of 2015 there were 8% of 25,300 primary health centres in the country without a doctor, 38% were without a laboratory technician, and 22% had no pharmacist. Nearly 50% of posts for female health assistants and 61% for male health assistants remained vacant. The situation gets worse in community health centres that delivers specialist healthcare with lack of surgeons (83%), obstetricians and gynecologists (76%), physicians (83%), and pediatricians (82%). Even in health facilities where doctors, specialists, and paramedic staff have been posted, their availability remains in question because of high rates of absenteeism.² The physiological process of a developing fetus within the maternal body is termed as pregnancy or Gestation which is 280 days from the onset of Last menstrual period (LMP). High risk pregnancy (HRP) is a condition in which a mother, her fetus or both are at higher risk of developing complications during pregnancy or childbirth than in a normal pregnancy. HRP require special care to ensure positive outcomes.³

Maternal obstetric monitoring (MOM) program was envisaged by Narayana Health (NH) in collaboration with NHM and Phillips to address the shortage of specialist doctors (Radiologists) in delivering obstetric services at Shorapur, a taluka in Yadgir district of northern Karnataka. The sub-district Hospital (SDH) strengthening in delivering antenatal care was done through capacity building of Medical officers, staff nurses, Auxiliary Nurse Midwifes (ANM) and Accredited Social Health Activists (ASHA) and installation of two Ultrasonography (USG) machines and a blood storage unit for treating severe anemia among pregnant women. Program MOM created a clinical workflow along with the taluka health office to identify and mobilize pregnant women in third trimester for USG scans from their villages through ASHA and ANM to the Taluka Hospital for USG screening. The travel

cost of the pregnant women from their villages to the SDH was arranged from JSSK funds. The radiologists would visit twice every week from Bangalore for performing USG scans at SDH. The radiologists were paid per case basis by the NHM and the impressions from the scans were used to evaluate the HRP. A manual HRP form was developed to assess and grade the severity of HRP based on age, height, medical history, obstetric history and investigations.

CASE REPORT

The study outlines two specific cases, one as followed up for USG screening and one through HRP forms. The case report emphasis on the obstacles addressed by program MOM in delivering essential antenatal diagnostic services in rural India to avert maternal deaths.

Case 1

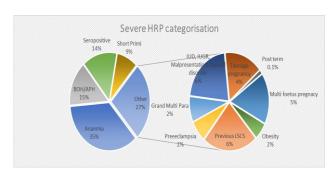
Fatima (name changed) an expecting-women with Thai card number 16169XXXX from a village in rural Shorapur taluka was scanned for USG by the radiologists from Bangalore at SDH on 21 January 2017. Fatima 21 years, primigravida hails from a barren dry village in Shorapur taluka. The family's main sustenance was farming in the arid drought-ridden land they owned. In her third trimester Fatima was approached by the ASHA worker encouraging her to get USG done to ensure safe delivery. Fatima was very reluctant as she had heard from her friends that scanning was very expensive and had no benefit as the result was almost always normal. She dismissed the ASHA worker citing that her husband and in-laws would not allow her. The ASHA worker spoke to the family, she informed them that the service was free and transport to the facility also would be provided, she shared anecdotes of women with high risk pregnancies and how scanning had benefitted both mother and new-borne. After much convincing Fatima half-heartedly agreed to accompany the ASHA worker for the scan. ASHA worker planned the logistics and fixed a date that suited the radiologist coming in from Bangalore as well as the pregnant women. One Friday morning they all boarded the bus and set off to the SDH. Fatima's scan was completed, the result was interpreted by the radiologists as 'transverse lie with right flank. This could result in a number of fatal outcomes; umbilical cord prolapse, birth trauma, premature birth, uterine rupture, maternal injury or death from hemorrhage, still birth, birth asphyxia or even septicemia. Fatima was counselled regarding her condition and the same was shared with the concerning medical officer at the PHC. The ASHA workers kept in touch with her to ensure that no complications developed. She was referred to the district hospital for delivery three days prior to her due date, however as there was no gynecologist, she had to be transferred to the Gulbarga district hospital which was 150 km away. She underwent Lower segment cesarean section (LSCS) and delivered a healthy baby boy weighing 2.4 kgs. Timely intervention with early identification of HRP averted MMR and now the baby and mother are both healthy.



Figure 1: Radiologist performing USG scan at subdistrict hospital.



Figure 2: ASHA and MOM program coordinator visiting Shankaramma.



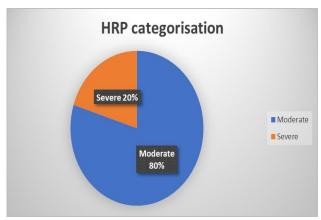


Figure 3: Severe HRP categorization from HRP forms.

Case 2

Anemia during gestation is a common problem that goes unattended. Pregnant women receive iron and folic acid tablets from ASHA workers, but in case of an emergency most FRUs do not have a blood storage unit. As part of Program MOM a blood storage unit was installed at the FRU and this proved to be life-saving. Shankaramma (name changed) aged 23 years with Thai card 16164XXXX was attending ANC clinic in Kaldevanahalli PHC on 20 February 2018 and her HRP form was filled. It was found that the ANC was severely anemic and was referred to the SDH immediately and her travel cost was borne from the program. She received two units of blood on 22 February 2018 and 24 February 2018. This resulted in increase of HB from 3 to 5.4 gm/dl. She had also undergone USG which revealed that the intrauterine growth was symmetrical. She was admitted into the Kakkera PHC on 20 March 2018 and gave birth to a healthy male baby 2.55 kgs on 23 March 2018. The timely intervention with blood transfusion averted the maternal death. Anemia is the most prevalent form of HRP in the taluka and the system strengthening with the blood storage unit resulted in treating the severe anemic ANC with blood transfusion.

Table 1: Outcomes of MOM program intervention in comparison of the baseline data of preintervention.

| Indicator | Baseline data (Shorapur Taluka) | MOM program data (Shorapur taluka) |
|--|--|---|
| Total number of pregnant women | 12567 | 5212 |
| Total number of ANC identified as HRP through Thai card | 754 (5.9%) | 1198 (23%) (including moderate (80% and severe 20%) |
| Total number of USG scans done | 0 | 5815 |
| Total number of HRP identified through USG | 0 | 1022 (19.6%) |
| HRP referred to higher centers | 154 (20.4%) | 2788 (53.5%) |
| No of blood transfusions done | 0 | 359 |

DISCUSSION

India contributes to 1/5th of the global burden of maternal deaths which is 254 per 100000 in 2005 and there has been a 4.7% annual decline in the maternal mortality rate which reduced to 212 per 100000 live births in 2010.⁴ Despite considerable progress India failed to achieve the MDG goal 5 (MMR <87) in 2015 with MMR standing at 167.⁵ There is a wide disparity between the states in India owing

to the systemic issues such as infrastructural capabilities and shortage of physicians in providing effective antenatal care services.⁶ The shortages in antenatal care delivery requires new innovations in technology and process to reach out to the rural population that can be achieved through Corporate Social Responsibility. Through Program MOM every week 500 pregnant women in their 3rd trimester utilized the free scan which would otherwise cost them 700-1000 rupees. MOM program was started in March 2016 and came to end in March 2018. During the program, a total of 5815 pregnant women utilized the USG screening of which 5200 women received at least 1 scan. Of the total women screened 17.5% (1022) were identified as HRPs based on the clinical impression by the radiologist and 53.5% (2788) were referred to higher center for safe delivery. During the two years of the program a total of 1200 HRP forms were collected of which 20% were categorized as severe HRP and the other 80% as moderate HRP. The severe HRP. It was found that among severe HRP, severe anemia (35%) is the major contributor for HRP followed by Bad obstetric history (BOH) (15%), seropositive (14%) and short primi (9%). HRP form was able to assess the severity of HRP and create a referral pathway to reduce intra partem complications.

CONCLUSION

The case study shows that the shortage of specialist doctors in rural areas can be addressed through workflow innovation and collaboration to ensure that the pregnant women receive qualitative antenatal care which is essential in reducing maternal mortality rate. We suggest that the government medical officers should be trained to perform the USG scans and using the advances in telemedicine the scans be evaluated remotely to address the shortage of radiologists in rural areas.

ACKNOWLEDGEMENTS

We would like to thank all the stakeholders of the program without whom the outcomes would not have been possible.

Funding: No funding sources Conflict of interest: None declared Ethical approval: Not required

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Cite this article as: Janagam SG, Kaniyampady ST, Shetty AN. Early identification of high-risk pregnancies in rural areas of Karnataka through maternal obstetric monitoring program. Int J Community Med Public Health 2020;7:4153-6.