"Evaluation of Maternal Morbidity Score (MMS) app as a new Screening Tool to predict   Peripartum Maternal Morbidity."

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Study Protocol

Conflict of Interest: None

Abstract:

Background- Maternal mortality is a preventable cause of death in low- and middle-income economies. The enormous physiological drive and the associated physiological adaptations in pregnancy delay the recognition of early warning signs of sickness.Unrecognized deterioration of clinical status leads to worsening of illness in pregnant women. Early detection of high risk mothers reduces maternal morbidity and mortality. Through global and national programmes aim at reducing the maternal morbidity and mortality the rate in developing countries remains same. One of the important reason for same is inability of screening high risk mothers and early transfer to higher centre.

Objective-Inpresentstudyweaimtostudy and   evaluate   Maternal Morbidity Score (MMS) app as a new Screening Tool to predict Peripartum Maternal Morbidity.

Methodology - Anobservational study of peripartum women beyond the 28 weeks of gestation. Purposive sampling technique will be used to collect data. Collect the data through using MMS app and also collect data from MEOWS chart .According to scoring system provide the intervention to the peripartum woman. Comparing with the both such as MEOWS and MMS app.

Expected Outcomes   - Early identification of abnormal parameter will be significantly help to detect high risk factors in all trimesters and will get immediate management during perinatal period.MMS tool willbeuseful for reducing maternal morbidity.

Conclusion:Early identification of high risk factor will help to reduce maternal morbidity in order to improve the health outcome of antenatal and intranatal period.

Keywords: Maternal morbidity score, Application, screening tool, MEOWS chart

INTRODUCTION

Most of the obstetric morbidities and mortalities occur in developing and under privileged countries; the occurrence being unacceptably high. These occur mostly around the time of delivery and in the immediate post-partum period. The peripartum period is very crucial for the pregnant woman, as most of the morbidities and mortalities occur in peripartum period[1]. There is a vast change in the physiology of the body during peripartum time. The enormous physiological drive and the associated physiological adaptations in pregnancy delay the

recognition of early warning signs of sickness.[2] Early identification of high risk parturient and maternal physiological deterioration.[3,4] High obstetric morbidity and mortality remain a major challenge in developing countries despite of implementation of international and national health care schemes and programmes[3]. As per the WHO, obstetric morbidity/maternal morbidity is defined as "morbidity in a woman who has been pregnant (regardless of the site or duration of the pregnancy) from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes"[4]. Currently,our nation accounts for 15% of the world's maternal mortality[5].

India's maternal mortality ratio has been reduced from 167 deaths per 1 lakh live births in 2013 to 130 deaths in 2016 and Maharashtra's MMR has been reduced from 68 in 2013 to 61 in 2016[6]. Reduction in MMR is largely due to government interventions such as the JananiShishuSuraksha Karyakaram[7].

Despite of these initiatives, India has still missed the Millennium Development Goal (MDG) target of lowering the maternal mortality ratio (MMR). To further reduce the maternal mortality ratio, the focus has been shifted to the new indicators like obstetric morbidity and severe maternal morbidity to mortality ratio which have been advised in obstetrics. Despite of these initiatives, India has still missed the Millennium Development Goal (MDG) target of lowering the maternal mortality ratio (MMR). To further reduce the maternal mortality ratio, the focus has been shifted to the new indicators like obstetric morbidity and severe maternal morbidity to mortality ratio which have been advised in obstetrics. Failures in health delivery system will be understood well by these indicators [8,9]. Maternal Near Miss (MNM) or Severe acute maternal morbidity (SAMM) refers "to a woman who nearly died but survived a complication that occurred during pregnancy, childbirth or within 42 days of termination of pregnancy"[10]. Most of the adverse pregnancy outcomes have the following set of deteriorating events starting from healthy and normal pregnancy to morbidity to severe morbidity converting to near miss followed by mortality. Early recognition and treatment of disease entities leading to obstetric morbidity can be done by the "track and trigger" system of parameters on a chart,thus preventing the obstetric morbidity and mortality[11].

Early detection of high risk mothers reduces maternal morbidity and mortality. Though global and national programmes aim at reducing the maternal morbidity and mortality the rate in developing countries remains same. One of the important reason for same is inability of screening high risk mothers and early transfer to higher centre.[3]

AIM OF THE STUDY
Evaluation Of Maternal Morbidity Score (MMS) app as a new Screening Tool to predict Peripartum Maternal Morbidity .

OBJECTIVES
1. To study the occurrence of peripartum of obstetrical morbidity in MEOWS group.
2. To study and compare between obstetric morbidity in MMS app.

3. To compare between the MEOWS chart with the MMS app to predict obstetric morbidity.

Rationale:

Deterioration of maternal health can occur at a very rapid rate, with catastrophic consequences therefore early recognition of signs and symptoms is essential. For maternal monitoring, MMS app tool (modified maternal scoring chart) is a simple and useful tool to record and predict the obstetric morbidity. By doing this study aimed to test the effectiveness of MMS app in diagnosing and predicting early peripartum obstetric morbidity before patient becomes critical.

RESEARCH GAP ANALYSIS

- Most of the obstetric morbidities and mortality occur in developing and under privileged countries; the occurrence being unacceptably high. These occurrence mostly around the time of delivery peripartum period.
- These occurrence mostly around the time of delivery peripartum period.
- Early detection of high risk mothers reduce maternal morbidity and mortality.
- Screening high risk patients in peripartum period plays important role in reducing risk of morbidity.
- Presently amongst various screening tool available in peripartum obstetric morbidity MEOWS chart is widely used screening tool which helps in prediction of maternal morbidity and mortality.
- As per the present evidence as a screening tool ,MEOWS chart has very good negative predictive value compared to its positive predictive value, the possible reason could be that it takes into account only general examination parameters taken at the time of admission in early labor.
- Developing a screening modality which has a better positive predictive value which will help standardize the referral of high risk patients to tertiary centers or triaging the patients to high risk units in tertiary hospitals will improve peripartum care and reduce morbidity.
- Peripartum morbidities are dependent upon many other high risk factors which could be found in antenatal history and also in abnormalities found in routine antenatal testing which can also be graded in scoring system.
- We propose a comprehensive screening tool app (score) for prediction of maternal morbidity and hypothesize that its predictive values will be significantly different (better) than the traditional MEOWS chart tool.

DESCRIPTION OF TOOL

The tool consist of 2 sections. A has structured questionnaire to assess demographic descriptions and section B will be standardized modified maternal mortality score .

➢ **The 3 zones in MMS app tool under which patient was categorised were:**

• **White zone** implied that value of the parameters was within the normal range.

• **Yellow zone** implied that the value of the parameter was moderately abnormal as per the MMS   app scoring.

• **Red zone** implied that the value of the parameter was severely abnormal as per the MMS app scoring.

➢ **Defining a trigger -**

In MMS app scoring, trigger wasdefined as either:

• **One red zone** - Any oneparameter that was markedly abnormal, with values in red zone as shown in table A

'OR'

• **Two yellow zones** - When simultaneously any two parameterswere moderatelyderanged with values in yellow zones as shown in table A

➢ While monitoring, the patients were divided into two groups – triggered and non-triggered group according to the parameters as explained above.

➢ **Triggered group** - Patients were classified into triggered group when any one parameter was in red zone or at least two parameters were in yellow zone on MMS app scoring.

➢ **Non-triggered group** - Patients were classified into non-triggered group when all parameters were in white zone amongst all parameters, or only one parameter was in yellow zone on MMS app scoring .

DATA COLLECTION

1.   Prior, ethical approval will be   obtained from Institutional Ethical Committee (IEC) for this study.

2.   At the time of recruitment of all patients, an informed written consent will be   taken in the language they understood.

3. A detailed history will be   taken including associated obstetric and medical history, whether or not they received any antenatal care or not, treatment taken before admission to the hospital, any delay in reaching hospital. At the time of admission, a detailed general physical and obstetrical examination will be carried out by a principal investigator in all recruited subjects. Antenatal profile investigations will be done at the time of admission and results will be noted.

4. The a new MMS apps monitoring will be done as per the standard protocol by principle investigator..

RESEARCH METHODOLOGY

Setting: The study will be conducted in the Department of Obstetrics and Gynaecology ofAcharya Vinoba Bhave Rural Hospital (AVBRH),Datta Meghe Institute of Medical Science (DMIMS) Sawangi (M), Wardha.

Research design: Observational study

Sampling procedure: Non probability convenient sampling

Independent Variable – In this study, independent variables is a new screening maternal mortality score tool.

Dependent Variable – In this study, dependent variable is mothers.

Samplesize:

- **Sample Size formula:**

$$n = \frac{Z_{\frac{\alpha}{2}}^2 \widehat{Se}(1 - \widehat{Se})}{d^2 \times \text{Prev}}$$

n – sample size

$Z_{\alpha/2}$ – level of significance at 5% i.e. 95% confidence interval = 1.96%

$\widehat{Se}$ – predetermined sensitivity from predetermined study

d^2 – precision of estimate

Prevalence – morbidity prevalence

- Minimum required sample size – 964
- A total of 1000 patients were enrolled into the study.

CRITERIA FOR SAMPLE SELECTION

Inclusion Criteria Antenatal women beyond 28 weeks gestation who were in labour and who delivered in next 24 hours

Exclusion criteria:

- Cases in whom pregnancy continued and did not terminate in next 24 hrs.
- Patients who did not give consent.

DESCRIPTION OF TOOL

The tool consist of 2 sections. A has structured questionnaire to assess demographic descriptions and section B will be standardized   maternal mortality scoring.

DATA COLLECTION

Prior, ethical approval will be   obtained from Institutional Ethical Committee (IEC) for this study.At the time of recruitment of all patients, an informed written consent will be   taken in the language they understood.A detailed history will be   taken including associated obstetric and medical history, whether or not they received any antenatal care or not, treatment taken before admission to the hospital, any delay in reaching hospital. At the time of admission, a detailed general physical and obstetrical examination will be   carried out by a principal investigatorin all recruited subjects. Antenatal profile investigations will be done at the time of admission and results will be noted. The a new MMS apps monitoring will be done as per the standard protocol by principle investigator.

STATISTICS:

Data will be entered in a predesigned proforma. Statistical analysis will be done by using descriptive and inferential statistics using chi square test. The software's used in the analysis will be SPSS 17.0 and Graph pad Prism 5.0 a value less than 0.05 for P will be considered as Level of significance.

Ethics and Disseminations:

This study is approved by the Institutional Ethics Committee from DMIMS (DMIMS (DU)/IEC/2020- 2021/9155).

Results This study is planned to Evaluate the MMS app scoring in peripartum woman for early detection of predictive morbidity tool and according to scoring system provide the appropriate intervention .

DISCUSSION

The reduction in the incidence of critical events is challenging for all the obstetric care providers. It has been clinically established that documented deterioration of physiological parameters precedes the catastrophic deterioration of patients in the hospital.Most of the health care systems are not following the assessment and monitoring charts for early detection of high-risk factors which can later on become a morbidity. Monitoring systems give a definite range of parameters and guidelines which are simple to follow and help to reduce the subjective bias in screening and diagnosing high risk cases and thereby morbidity.[3]WHO says "There is a story behind every maternal death or life threatening complication. Understanding the lessons to be learnt can help to avoid such outcomes."In order to obtain a clear picture, we need to integrate and analyse the maternalmorbidity and mortality data simultaneously so that we can provide the best care onour part to all the pregnant women. An adverse pregnancy outcome can be seen as a continuum of deteriorating events from normal state to death.

Most of the obstetric morbidities and mortality occur in developing and under privileged countries; the occurrence being unacceptably high.These occurrence mostly around the time of delivery peripartum period.Early detection of high risk mothers reduce maternal morbidity and mortality.Screening high risk patients in peripartum period plays important role in reducing risk of morbidity.[5]

Presently amongst various screening tool available in   peripartum obstetric morbidity MEOWS chart is widely used screening tool which helps in prediction of maternal morbidity and mortality. To prevent unnecessary economic losses and to optimize the use of Intensive Care Unit (ICU) resources for the patients who actually need it, different scoring systems are being used. Prognostic scoring systems aid in making distinction among cases that requires ICU admissions from those who can be safely monitored in intermediary care and obstetric units.These following tests have been used in various studies regarding their ability to assess the severity of illness & predict outcome in obstetric patients admitted to ICU.

As per the present evidence as a screening tool ,MEOWS chart has very good negative predictive value compared to its positive predictive value, the possible reason could be that it takes into account only general examination parameters taken at the time of admission in early labour.[6]There is need to develop a uniform measure of maternal morbidity. This need is underscored by the increased maternal death rate as a whole. Yet, maternal death, although clearly important to track on a national level, occurs so uncommonly that it cannot be used in an individual institution for quality of care surveillance. However, there is no uniform agreement about which is best to use, and each has its own limitations.

Developing a screening modality which has a better positive predictive value which will help standardize the referral of high risk patients to tertiary centers or triaging the patients to high risk units in tertiary hospitals will improve peripartum care and reduce morbidity.[7]

Peripartum morbidities are dependent upon many other high risk factors which could be found in antenatal history and also in abnormalities found in routine antenatal testing which can also be graded in scoring system. Many studies related to perinatal maternal health have been reported[12-14]. Kshirsagaret. al. conducted evaluation of serum ferritin level in anaemic and nonanemic pregnant women & its correlation with maternal and perinatal outcome[15]. Interesting studies were also reported by Memonet. al.[16] and Reddy et. al. [17].Patel et. al. evaluated the effect of care around labor and delivery practices on early neonatal mortality in the global network's maternal and newborn health registry[18]. Bausermanet. al. reported on maternal mortality in six low and lower-middle income countries [19]. A study on validation of similar app on neonatal health was reported by Patel et. al. [20].

We propose a comprehensive screening tool app (score) for prediction of maternal morbidity and hypothesize that its predictive values will be significantly different (better) than the traditional MEOWS chart tool.

CONCLUSION: Conclusion will be drawn after the statistical analysis of result.

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