Original Article

Obstetric morbidity and mortality: Exploration of the use of Maternal Early Warning Scores (M-EWS) for recognition and escalated timely interventions in acute obstetric emergencies in Nigeria

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ABSTRACT

Severe Obstetric Emergencies: Use of Maternal Early Warning Scores (M-EWS) in Nigeria. Maternal Early Warning Scores (M-EWS) is a patient illness severity scoring system that aids tracking and timely escalation of acutely deteriorating obstetric patients. M-EWS has been demonstrated to reduce substandard care, obstetric complications, and maternal mortality in the United Kingdom and a number of other countries.

Background: Successes in the prevention of maternal mortality attributed to this tool in the United Kingdom where it is in established use coupled with high potential for its usefulness in other countries prompted the inclusion of the M-EWS in the post 2015 United Nations Sustainable Development Goals for the 193 member nations.

Aims: We set out to explore the availability of M-EWS for the recognition and escalated timely interventions in obstetric emergencies in Nigeria and a desire for its application.

Methods: A combination of SurveyMonkey (online) and paper-based questionnaires distributed to clinicians of all teams and grades involved in obstetric care was used.

Results: In all, 76 responses (17 online and 59 paper-based questionnaire) were received out of 30 e-mails and 70 paper-based questionnaires. Nineteen (25%) clinicians reported use of a physician-specific calling system but none had the M-EWS in use. Three respondents (4%) were not certain whether M-EWS would be welcomed in their service, but 73 (96%) welcomed the introduction of the M-EWS.

Conclusion: This survey shows the lack of M-EWS in obstetric practice in Nigeria and strong desire for its introduction. Consequently, some collaborative work aimed at refining this tool for the Nigerian obstetric environment has commenced.

Key words: Emergency obstetric care; Maternal Early Warning Scores; maternal mortality; patient safety in Nigeria.

Introduction

Many in-hospital deaths appear preventable;[1-3] frequently, deaths follow failure to recognize or respond to patient deterioration.[4] Improving the recognition of acute deterioration and preventing mortality require a step-wise

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Access this article online	
Website: www.tjogonline.com	Quick Response Code
DOI: 10.4103/TJOG.TJOG_6_19	

How to cite this article: Isemede AO, Unuigbe JA. Obstetric morbidity and mortality: Exploration of the use of Maternal Early Warning Scores (M-EWS) for recognition and escalated timely interventions in acute obstetric emergencies in Nigeria. Trop J Obstet Gynaecol 2019;36:165-9.

solution involving *staff education*, *patient monitoring*, *recognition of patient deterioration*, *a system to call for help*, *and an effective clinical response*.[5] This five-ringed "chain of prevention" can provide a structure for hospitals to design care processes to prevent and detect patient deterioration and death. The Maternal Early Warning Scores (M-EWS), a patient observation and illness severity scoring system, provides solutions to many of these and can set the foundation for team approach to emergency obstetric care (EMOC) based on Unuigbe's firmly expressed concept of a background of "24 hours – Health Institutional Combat Readiness, 24hr-HICR."[6]

The findings of substandard care and mortalities attributed to failure of clinical staff to recognize acutely deteriorating obstetric conditions and escalate sooner that were reported in the confidential enquires into maternal and child health (CEMACH) of 2003–2005 prompted a recommendation in the report, "There is an urgent need for the routine use of a national early warning chart, which can be used in all obstetric women which will help in the more timely recognition, treatment and referral of women who have, or are developing, a critical illness."[7] The M-EWS which came from this recommendation has been extensively scrutinized and validated[8] and endorsed by the National Institute for Health and Clinical Excellence (NICE), UK.[9] The usefulness of this obstetric track and trigger has also been recognized in the United States.[10] Internationally, the United Nations (UN) has endorsed and adopted this tool in the 2016 Sustainable Development Goals (SDGs) within Goal 3, target 13 (*SDG3:13 4 Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks*).

With the very high maternal mortality rates in Nigeria, and the nation being signatory to the UN SDGs (2016), this study was designed with two aims, as described below.

Aims

i. To explore the availability of the M-EWS in obstetric practices in Nigeria, and
ii. Desire for the use of M-EWS by trained staff for track and trigger of acutely deteriorating women where it is not in use.

Methods

A combination of SurveyMonkey (online) and paper-based questionnaires distributed to clinicians of all teams and all grades involved in obstetric care was used. The combination of online and paper-based questionnaire was used because of the poor response to the online survey despite reminders. The low response from online survey could be due to technical, technological, and other constraints.

The paper-based questionnaire was administered during a 3-day national conference in Benin-City, Nigeria (*Intercurrent Medical Diseases in Pregnancy: Anaesthesia and Maternal Safety, the Critically Ill Obstetric Patient*, organized by the Society of Obstetric Anaesthetists of Nigeria). Obstetric anesthetists drawn from all geopolitical zones of Nigeria and local practitioners in obstetric emergency care (obstetric anesthetists, anesthetists, nurse anesthetists, obstetricians, midwives) present at the conference were surveyed. Other obstetric emergency care practitioners (obstetric anesthetists, anesthetists, nurse anesthetists, obstetricians, and midwives) in the local hospitals (Benin City) not present at this meeting were also surveyed.

The inclusion of clinicians (obstetric anesthetists) drawn from across Nigeria and all teams in obstetric emergency care from local hospitals provided good representative sample.

Results

In all, 76 responses (17 online and 59 paper-based questionnaire) were received out of a total of 30 e-mails and 70 paper-based questionnaires that were sent.

All respondents reported the availability of patient observation chart [Table 1 and Figure 1].

Nineteen (25%) respondents reported availability of patient observation chart and physician-specific calling advice (varied with admitting doctor or on-call doctor).

None of the respondents reported the availability of patient observation chart that had an in-built escalation protocol (official calling system) adopted by the hospital for use by all clinicians and teams involved in emergency obstetric care [Table 2 and Figure 2].

Table 1: Survey methods

Survey methods	Requests	Received
Online (SurveyMonkey)	30	17
Paper-based questionnaire	70	59
Total	100	76

Table 2: Availability of vital signs charts and objective escalation (calling criteria)/M-EWS

Vital signs chart available	Yes 76 (100%)	No 0 (0%)
Vital signs chart and physician calling advice available	Yes 19 (25%)	No. 57 (75%)
Vital signs chart and institutional escalation protocol available	Yes 0 (0%)	No. 76 (100%)

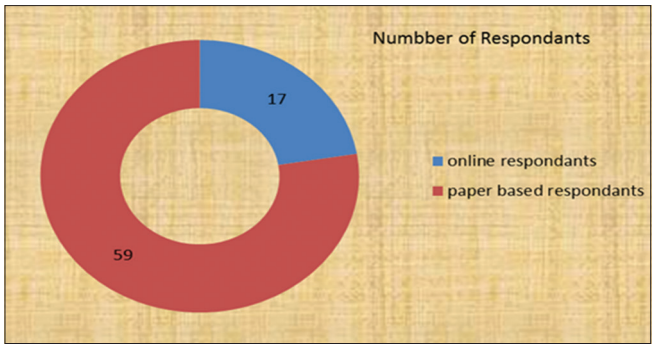

Figure 1: Respondents

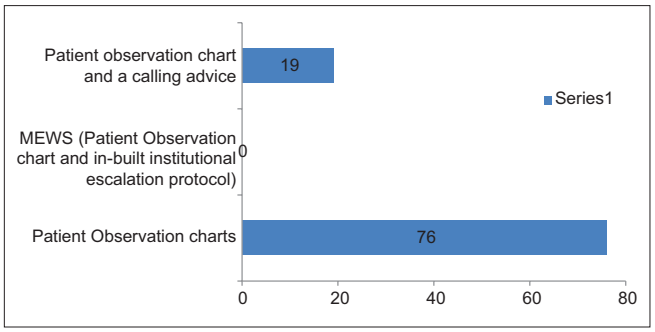

Figure 2: Patient observation chart, physician-specific calling advice, and M-EWS (patient observation chart and in-built institutional escalation protocol)

Three (4%) of the respondents were uncertain whether the M-EWS would be welcomed in their maternity unit. Seventy-two (96%) of the respondents, however, indicated desires to have the M-EWS implemented in their maternity units [Table 3].

Table 3: Desire for the use of M-EWS in maternity unit (where not available)

M-EWS not available	76 (100%)
Yes (M-EWS desired)	72 (96%)
Not certain	3 (4%)

M-EWS, Maternal Early Warning Scores

Discussion

The EWS is a system for the early detection of actual or potential deterioration of patient's physiological state to reduce morbidities and mortalities[11] The M-EWS also referred to as Modified Obstetrics Early Warning Scores (MOEWS) in the United Kingdom is the maternity version of the EWS; this modified maternity version is necessitated by the physiological changes of pregnancy. In view of the many variations in the M-EWS from the United Kingdom (MOEWS), Republic of Ireland, Belgium, and the United States, and the patient safety risk implications of import of several versions of MEWS into Nigeria, we have begun some collaborative work aimed at refining this tool for the Nigerian obstetric environment, to be followed by training of staff and pilot studies.

Most pregnancies and labor tend to be normal physiological events, but potential risks of complications and deterioration exist with each and every case. Because not all deteriorations can be predicted, it is necessary to monitor these women very closely, and this involves recording and acting on vital signs.[12]

Acute illness in the obstetric patient needs to be recognized early and adequate monitoring instituted to prevent physiologic deterioration and a cascade of events to organ failure, multiorgan failure, and cardiorespiratory arrest. Routine patient observations which are only periodic – done at fixed intervals or sometimes not done – are inadequate for acutely deteriorating emergency obstetric emergencies where maternal collapse and deaths can occur precipitously.

The vital signs monitored in the M-EWS are as follows: respiratory rate, heart rate, blood pressure – systolic and diastolic, temperature, oxygen saturations, and level of consciousness (using the AVPU = (A) lert, response to (V) oice, response to (P) ain and (U) nresponsive). Every recoded vital sign generates a score of (0–3) depending on size of deviations from normal: 0 for parameters within normal physiological limits and a score of 3 for the most severe deviation; a total track and trigger score is generated by adding all the scores generated from the vital signs.

A graded response (escalation) strategy for patients identified to be at risk of clinical deterioration is used – low score group: increased frequency of observations, document/report; medium score group: urgent call to local team leader; high score group: immediate response and emergency call to specialist team.

The M-EWS is useful in providing visual aids of trends, revealing "hidden" trends, facilitating shared understanding, and providing legitimacy for escalation that entails timely recognition of deterioration, good communication between teams, expedited treatment, and/or referral.[13,14]

The early recognition of acute deterioration afforded by the MEWS enables earlier interventions to prevent deterioration, reduces delays in reaching point of definitive care, reduces delays in obtaining definitive care, and saves lives and resources. The MEWS reduces failure to rescue which has been shown to be as high as 15% in in-hospital populations.[15,16] The MEWS also holds promise for improving care in the primary care setting, facilitating earlier referral to specialist care centers, and improving communication across primary and secondary care.[17]

This initial exploratory study showed that MEWS (patient vital signs chart plus in-built escalation protocol that has been formally adopted for all maternity staff and teams to use) for the track and trigger of acutely deteriorating obstetric emergencies is absent in the maternity units of surveyed clinicians. About 25% of the clinicians, however, reported the availability of vital signs charts and doctors' calling advice (calls to the doctor instituting the guidance).

In implementing the MEWS in Nigeria, caution must be exercised to ensure that mistakes made in other countries in the implementation of the early warning systems are not repeated in Nigeria; mistakes such as multiple versions of the early warning scores in simultaneous use with patient safety risk implications. One of these reported examples is the United Kingdom that had over 72 recorded versions of the early warning system in use at different hospitals prior to the call of the Royal College of Physicians, London, for a national early warning scores.[18-20]

Caution must also be exercised to prevent overdependence on scores by recorders without due regard to clinical judgement which has also been shown as a risk in this process.[21] Likewise, the early warning system is not a replacement for adequate staffing; in Sub-Saharan Africa where the challenge of skilled birth attendants is acute, this temptation must be resisted. The MEWS is also not for chronic patients or patients on end of life pathway. Failure to clearly separate these and attend to the other concerns above could complicate the introduction of early warning system (M-EWS) in Nigeria. Similarly, as attractive as it may be to deploy the MEWS into primary obstetric care in Nigeria to support the low levels of skilled birth attendants, such deployment must be preceded by preliminary studies to establish possible local modifications.[22] Collaborative action for the development of a Nigerian national maternal early warning system followed by systematic pilots in both the secondary and primary settings before wholesale deployments are keenly advocated.

Ultimately, it must be stressed that the MEWS is only a part of a bundle of care for reducing maternal morbidities and mortalities; achieving success (meeting the goal of reduction in maternal morbidities and mortalities) or failure is likely to reside in the interplay between complex clinical pathways involving clinicians and their health institutional environment (provisions, protocols, and policies) as well as attention to the rings of safety that are all enhanced by an underlying principle of the "24 hours – health institutional combat readiness, 24hr-HICR" that is keenly advocated by these authors.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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