Quality of care in severe maternal morbidity in a referral hospital in Kenya

Chemwey RN, Okutoyi KL

Department of Obstetrics and Gynaecology, Kenyatta National Hospital, Nairobi, Kenya

Correspondence to: Dr. R.C. Ndiema. Email: rosachemwey@gmail.com

Abstract

Background: Studying cases of near miss or severe acute maternal morbidity are increasingly recognized useful measures in implementation of quality obstetric care.
Objective: To describe the quality of care in severe maternal outcomes at Kenyatta National Hospital.
Method: This was a prospective mixed method study design done from the Reproductive Health, Accident and Emergency, Renal Unit and Critical Care Unit of Kenyatta National Hospital. Two hundred and twenty eight health records of patients with severe maternal outcomes and key informant interviews were performed via simple random sampling. Data was entered into STATA checked for completeness, errors and outliers. Summarized data were presented in tables, graphs and charts.
Results: All 5 units assessed had required resources to provide comprehensive Emergency Obstetric Care and specialized care to patients diagnosed with severe maternal morbidity. Peer reviews were mostly done through inter departmental consultations. There was no clear reward mechanism for good work done, however, disciplinary measures were well outlined through relevant committee. Adherence to standard operating procedures was generally poor and deteriorating over the time of the study.
Conclusion: Gaps exist in comprehension of standard operating procedures while managing severe maternal morbidity at Kenyatta National Hospital despite this hospital having resources for better services. We recommend regular and scheduled clinical audits of severe maternal morbidity followed with feedback to clinicians to facilitate better use of evidence based guidelines.

Key words: Severe maternal morbidity, Quality of care, Postpartum haemorrhage, Eclampsia, Sepsis

Introduction

Increasing quality of care for both mothers and neonates in most facilities in developing countries is key to reducing maternal and neonatal morbidity and mortality. There is continued global mortality arising from maternal causes in spite of good progress in maternal care in the recent years. Evidence has shown that poor quality of facility-based care for these women and new-borns is one of the major contributing factors for their elevated rates of morbidity and mortality (1, 2).

Maternal deaths have been described as the tip of the iceberg and maternal morbidity as the base. For every woman who dies of pregnancy-related causes, 20 or 30 others experience acute or chronic morbidity, often with permanent sequel that undermine their normal functioning (3).

In rural Tanzania, for example, it was found that the occurrence of Severe Maternal Morbidity (SMM) was associated with discrepancy in actual and optimal use of evidence-based interventions (4). Lastly, clinical review of identified cases of SMM can provide an opportunity to identify points of intervention for quality improvement in maternal care (5). This study aimed at assessing whether Kenyatta National Hospital adheres to the standard operating procedures while managing SMM.

Materials and Methods

Study design: Prospective cross-sectional design.
Study site: Kenyatta National Hospital, departments that manage obstetric patients including Reproductive Health, Accident and Emergency, Renal Unit and Critical Care Unit.
Study population: Data on process of care was obtained from the medical records of mothers diagnosed to have a severe maternal complication while data on structures in place to manage patients in question was collected via appraisal of the facility and filling in of an appropriate checklist.
Sample selection: Simple random sampling.
Sample size: A sample size 228 cases were used with distribution as follows:

SMM diagnosed	Cases to be assessed	Percent representation
Severe postpartum heamorrhage	76	34%
Severe pre-eclampsia	46	20%
Eclampsia	27	12%
Sepsis or severe systemic infection	34	15%
Severe complications of abortion	31	14%
Ruptured uterus	14	5%

Tools of development/data collection: Data was collected from review of medical records of patients being managed for SMM and filled into the data abstraction sheets, while for structures in place a walk-through of the facility as guided by the prescribed guidelines of Ministry of Health in "*Clinical Manual for level 4-6 hospitals in Kenya*". Questionnaire was developed based on the manual, put in soft copy application and updated daily with data on process indicator until the day of discharge of the recruited patients. This study adopted the *Donabedian model*, having identified the outcome as Severe Maternal Morbidity (SMM) and focusing on the structure and process effectiveness.

Data processing and analysis: Quantitative data was entered into STATA cleaned and summarized into tables, graphs and charts. Data analysis was conducted to determine strength of association between dependent and independent variables using chi- square test for categorical variables and students' t-test for continuous variables while correlation of data was analysed between different variables.

Ethical consideration: The study was approved by ethics review board of KNH-UON.

Results

Organisational structure: All 5 Unit in charges were interviewed using a Key Informant Interview guide on organizational structures such as staff qualifications and numbers, methods of peer review, recognition of work well done and punishment mechanisms in place with the following findings:

Renal unit: Peer review is through consultations by writing a consult or a direct discussion between clinicians. There were direct reward mechanisms save for the rotational trophy given to the best performer and would be passed on to the next person in the assessment year. However, staff were rebuked verbally and if persistent by writing from the disciplinary committee.

Maternity theater: For the reward aspect, a performing staff would be given a day off duty with verbal compliments. The best nurse would be given an annual award known as the Nurse of the year award. Punishment was mainly through verbal warning and disciplinary committee writing.

Labor ward: Midwives had an internal peer review mechanism amongst each other and the doctors executing roles in labor ward. The best nurse would be given a day off duty. Punishment was mainly through verbal warning and disciplinary committee writing.

Critical Care Unit: Peer review through verbal consultations and ward rounds which they discuss new and old patients. No reward mechanism because they work as a team, however sometimes awards for the ones that deal with equipment like Gemba Kaizen. For punishment the in-charge deals with it.

Accident & Emergency (A&E): Peer review though consultation with on call doctor while staff rewarded verbally or through clapping. Punishment is via verbal warning then disciplinary committee recommendation.

Ward 1D: Peer review was done for SMM during major ward rounds alone. Awards done annually while punishment is forwarded to the disciplinary committee for more investigation.

Structure indicators showed that Labour Ward scored 100% (Excellent) while Critical Care Unit (CCU) had 60% (Moderate). In maternity theatre and Accident and Emergency theatre 50% and 60% (moderate score) of equipment assessed were functional respectively at the time of study. In comparison, had similarly 70% availability but 60% functionality.

Nurse patient ratio was lowest in CCU (1:3) while doctor patient ratio was lowest A&E (1:4). However, Ward 1D was highest in both cadres at 1:375 for doctors and 1:48 for nurses. The overall doctor: patient ratio and nurse patient ratio was at 1:89 and 1:6 respectively. For quantitative data on key clinical practices compared against the Standard Operating Procedures (SOPs), average age of mothers was 28 years with almost equal distribution of antepartum and postpartum case admission (46.4% versus 47.9%). In addition, most outcomes were favorable where mother was alive at time of discharge (65%) compared to poorer outcomes such as still births (4.9%) and abortions (28.5%). Labour ward had most admissions (65.7%) while Renal Unit and ICU were least at 0.8% and 1.1% respectively. At admission, most were stable in condition (57.7%), came as referral from peripheral facilities (70.2%) and 54.7% had not started antenatal follow up at time of admission. Of the 65 cases with documented delays, 21.1% were attributed to the first delay.

Process of care: 21-day follow up

A general decline in vital signs and input/output monitoring from day 1 onwards for 4 SMM except ruptured uterus as in Figures 1 and 2 respectively while antibiotic administration in sepsis and severe complications of abortion was consistent as shown in Figure 3.

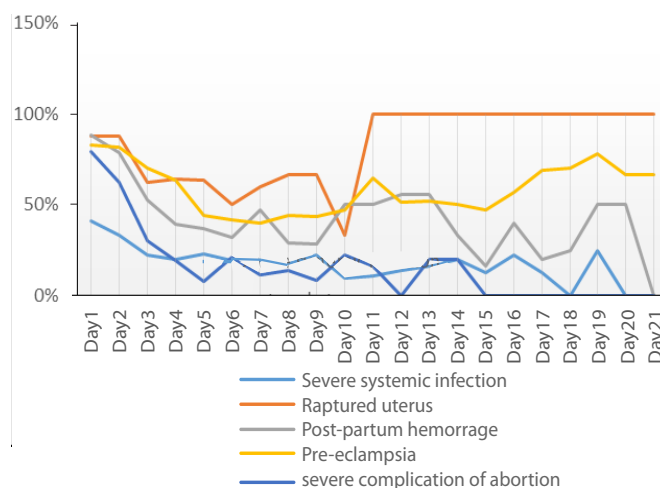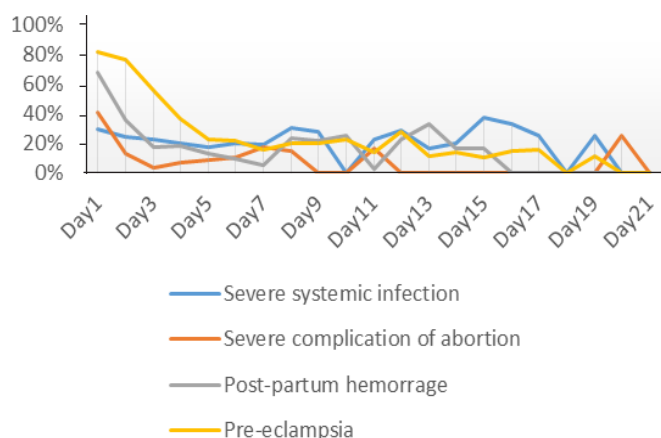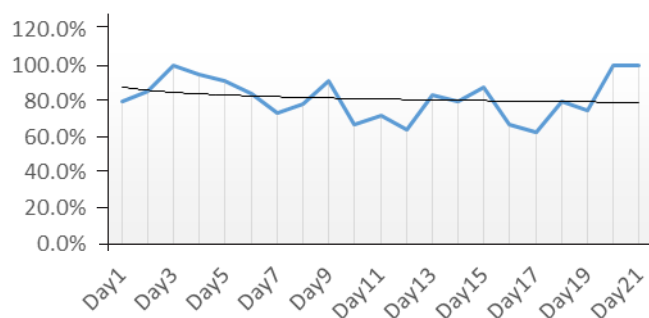**Figure 1:** Blood pressure/pulse rate monitoring in the 5 severe maternal morbidities

Figure 2: Input output charting in severe maternal morbidity

- Severe systemic infection
- Severe complication of abortion
- Post-partum hemorrage
- Pre-eclampsia

Figure 3: Antibiotic administration in sepsis

In addition, there was sporadic prescription of septic screen and end organ damage assessment for sepsis and eclampsia and severe preeclampsia as shown on Figures 4 and 5.

Figure 4: Septic screen for sepsis and severe complications of abortion
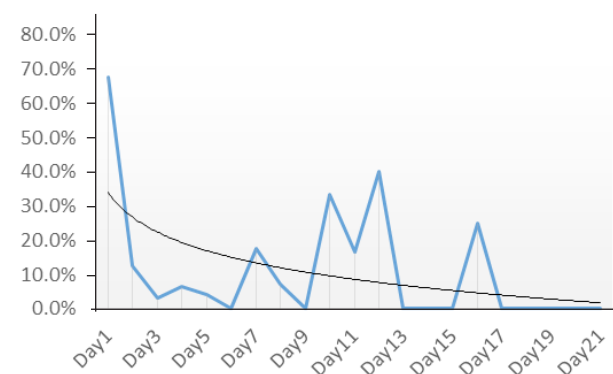
Figures 5: Renal and liver function assessment in severe preeclampsia and eclampsia
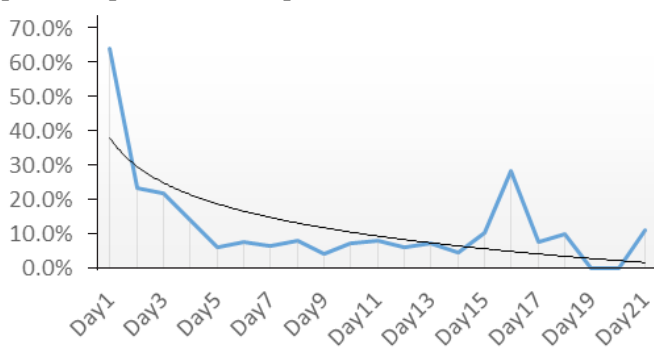
Discussion

Health workers are the key to realising the potential of improved quality of care for mothers and new-borns in weak health systems such as in sub Saharan Africa. In this study, there was no structured reward system for exemplary work, however castigation mechanism for errand staff were clearly defined through verbal rebuke and discussions within disciplinary committees. In a Tanzanian study, health workers reported that non-existence of a formal motivation scheme and a free avenue for voicing and sharing health workers' concerns affected their work especially in maternal care. Other challenges reported were lack of a clear strategic plan for staff career advancement and continuous professional development to improve health workers' knowledge and skills necessary for providing quality maternal health care (6).

Furthermore, this study demonstrated that the doctor and nurse to patient ratio was high. This concern has been observed in other studies (7). A robust health workforce is the backbone of each health system, the lubricant that facilitates the smooth implementation of health action for sustainable socio-economic development; and that the ratio of the health workforce is directly correlated with positive health outcomes (7).

Resource readiness scored between 60-100%, and in comparison to this finding, a systematic review to explain differences in maternal mortality levels in sub-Saharan African hospitals showed that there is need to improve the organisation of health systems and the quality of care that is being offered in health facilities to pregnant women in Africa (8) in order to reduce severe maternal morbidity.

In this study, we demonstrated gaps in standard operating procedures. A similar finding on uptake of guidelines showed that urban non-teaching hospitals had the highest rates of non-compliance with evidence-based practice, and that issuance of clinical guidelines precipitated a narrowing of this discrepancy (9).

Conclusion

Gaps exist in comprehension of standard operating procedures while managing severe maternal morbidity at Kenyatta National Hospital despite this hospital having resources for better services. We recommend regular and scheduled clinical audits of severe maternal morbidity followed with feedback to clinicians to facilitate better use of evidence based guidelines.

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