

Adherence and challenges in implementing national guidelines on management of severe pre-eclampsia and eclampsia by health workers at mbarara regional referral hospital

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Confidence A, Wanyenze E, Groves S. Adherence and challenges in implementing national guidelines on management of severe pre-eclampsia and eclampsia by health workers at mbarara regional referral hospital. *J Reprod Biol Endocrinol*. 2022;6(3): 01-08.

ABSTRACT

BACKGROUND: Pre-eclampsia/eclampsia remain conditions of public concern and the second leading causes of maternal mortality in Uganda. For this reason, Uganda Ministry of Health (MOH) adapted the WHO guidelines for management of pre-eclampsia/eclampsia and implemented them in order to standardize care across all health workers who provide care to patients with these conditions. Despite this effort, the morbidity and mortality from these conditions has not changed.

OBJECTIVE: The main purpose was to assess health workers' adherence to Ugandan guidelines set for management of severe pre-eclampsia and eclampsia and explore the challenges affecting their implementation.

METHODS: A mixed method study was done. The study was done in Mbarara Regional Referral Hospital. A checklist that was a template of the Pritchard Uganda MOH guidelines was used to collect data from hospital records of 2018 for quantitative analysis and a qualitative interview guide was used to obtain data from health workers to explore challenges that influence adherence to guideline of managing severe pre-eclampsia.

Descriptive statistics such frequencies, percentages and means were used to determine the level of adherence. Content analysis was used to analyze the qualitative data.

RESULTS: A total of 72 records were reviewed. There was 50% adherence of the ten items on the protocol. The best items of the protocols adhered to was anti-hypertensive and magnesium sulfate administration started within 20 minutes of admission at 72 (100%) and 67(93.1%). There was a significant figure of 54 (75%) of the patients who missed to be seen by obstetrician within 15-30 minutes of admission and monitoring of deep tendon reflexes plus respiratory rate 45 (62.5%). The sub-optimal adherence to guidelines was mainly influenced by inadequate resources especially human resource and lack feedback from senior members.

CONCLUSION: The study showed a situation of care in discordance with the prescribed standards. The sub-optimal adherence to standards was mainly influenced by inadequate resources especially human resource and lack of feedback from senior members.

RECOMMENDATION: More emphasis should be put on all indicators. There is overall need for regular feedback, improvement in documentation and provision of appropriate logistics if these are not available for emergency conditions to ensure better patient management.

Key word: HDP; Eclampsia

INTRODUCTION

Hypertensive disorders of pregnancy (HDP) primarily pre-eclampsia and eclampsia (PE/E), as major causes of maternal morbidity and mortality worldwide. Globally, Maternal Mortality Rate (MMR) has remained high at 216 per 100,000 live births [1]. It is approximated that 99% of these deaths occur in developing countries and 10 % of the overall maternal mortality occurring in Africa are associated with hypertensive disorders [2].

Pre-eclampsia is a hypertensive condition of pregnancy usually diagnosed after 20 weeks of gestation and present as late as 4 to 6 weeks postpartum [3]. It can as well develop in women whose BP was previously normal. When not managed well, it progresses into eclampsia which manifests as seizures without any other neurological cause.

Internationally, from the Cochrane reviews, WHO developed recommendations to guide health workers' practice when managing patients with PE/E [3]. These recommendation consider patient management manage basing on evidence and disease magnitude. The management using recommendations included: administration of calcium supplements, prophylactic use of low dose aspirin (75 mg) to high risk pregnant mothers, Use of Magnesium Sulfate (MgSO₄) for seizures management, induction of labor when gestation is above 34 weeks and with evidenced Intra Uterine Fetal Death (IUFD), delivery for women at term, use of antihypertensive medicine to manage mild and severe PE, and administration of pre-referral loading dose of MgSO₄ before the patient is transferred to a higher facility [3].

However, the success of the care given depends on health workers' adherence to these guide lines. Studies done that assessed quality of patients

care and health workers' adherence to guidelines for management of PE/E, acknowledged that these guidelines are a key in preventing poor maternal outcomes [4,5]. Furthermore, adherence to the guidelines helps the health care providers to correctly manage the patient with PE/E using evidence based care, increasing the chances of detecting the complications early and ultimately contributing to better maternal outcome [6].

The Ugandan Ministry of Health (MOH) adapted the WHO guidelines and incorporated them into the Ugandan clinical guidelines (Ministry of Health, 2012) which are available in all health facilities both as hard and soft copies [7]. In addition, MOH Uganda and other development partners put effort into training health workers who manage patients with pre-eclampsia so that they are equipped with the necessary skills of how to better manage these patients [8].

Despite these efforts, MMR for Uganda has remained high at 336/100,000 live births with PE/E accounting for 6 percent of these deaths [9]. Lumala, Sekweyama, Abaasa, Lwanga, and Byaruhanga (2017), conducted a criteria based audit in nsambya Hospital, in Uganda and found that adherence to PE/E guidelines was highly associated with improvement in quality of care to the patients.

Some few studies done in Uganda have little documented in regards to health workers' adherence and challenges in implementing national guidelines in management of PE/E in Uganda. Thus, for evidence based care a study need to be conducted to assess the level of adherence and explore the challenges encountered with implementation of Ugandan guideline for the management of PE/E.

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Received: March 06, 2022, Manuscript No. M- PULJRBE224569; Editor assigned: March 08, 2022, Pre-QC No. PULJRBE224569; Reviewed: March 18, 2022, QC No. PULJRBE224569(Q); Revised: March 23, 2022, Manuscript No. PULJRBE224569 (R); Published: March 29, 2022, DOI: 10.37532.2022.6.3.1-8



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Problem statement

Deaths and complications associated with pre-eclampsia and eclampsia remain high in Uganda despite adaptation of WHO guidelines by MOH [9]. Mbarara Regional Referral Hospital (MRRH) follows MOH Uganda policies therefore must be implementing the Ugandan guidelines for management of PE/E. However, the hospital reported in 2107/2018 over 100 PE/E cases per 10,000 live births and 6 maternal deaths were a result of these conditions [10].

At MRRH, in practice the researcher observed that several of the health workers were not performing as per MOH standards for severe pre-eclampsia/eclampsia management. For example there is inconsistency in taking blood pressure, testing urine using the dip stick, incomplete documentation, and lack of confidence in the use of magnesium sulfate to manage severe PE/E. The reason behind these practices of omission is not known.

Severe PE/E when not managed well is associated with a vast number of complications including: eclampsia, liver damage, renal failure, coagulopathy, HELLP syndrome, pulmonary edema, stroke and cerebral hemorrhage and blindness [11,12]. Poor management these patients further increases the need to use the already few available ICUs in Uganda.

According to Lumala et al. (2017), correct use of guidelines and good medical practices were found to improve maternal outcomes among patients with severe PE in a study that was conducted at St. Francis Hospital Nsambya. Therefore, the question is why the protocols are not being fully implemented at MRRH [13].

No studies on adherence to the guidelines for management of severe PE/E and health workers' perspective regarding the challenges affecting their implementation were found about the study area. Thus the need for this study to answer why the protocols are not being fully implemented at MRRH.

Study objectives

Broad objective: To assess health workers' adherence to Ugandan guidelines set for management of severe pre-eclampsia and eclampsia and explore the challenges affecting their implementation.

Specific objectives: To determine health workers' adherence to national guidelines for management of pre-eclampsia and eclampsia at MRRH.

To describe the challenges affecting health workers' adherence to national guidelines for management of severe pre-eclampsia and eclampsia at MRRH.

Research questions

What is the level of adherence to national guidelines for management of pre-eclampsia and eclampsia?

What are the challenges hindering health workers' adherence to the guidelines?

Significance of the study

Early diagnosis and treatment of pre-eclampsia is key to prevent its progression to eclampsia, a life threatening condition for mother and infant. The condition requires critical care interventions which are limited in Uganda. The interventions when provided prevent negative maternal and perinatal outcomes that contribute to high maternal morbidity and mortality in Uganda. Therefore utilizing the guidelines well in practice can best decrease this morbidity and mortality.

Nursing practice: The results of this study will help to identify the gaps in adherence and challenges to implementation of Ugandan guidelines for the management of PE/E thus providing a basis for improvements in the quality of care and maternal outcomes. Also it will help in informing policy makers to address the mentioned challenges.

Nursing education: This study will improve on the body of knowledge of nursing as well as other disciplines essentially in the area of PE/E management. The faculty using these guidelines can facilitate student learning and practice of these guidelines.

Nursing research: The study results will contribute significant knowledge in addressing the problem of PE/E in Uganda. It will also provide information for further studies in the area of PE/E in Uganda.

Conceptual frame work

Management of PE/E is influenced by many factors such as: gestational age, fetal condition and disease severity. Its appropriate management is to

appreciate these factors. According to WHO, it was clearly found out that use of standard guidelines can help reduce morbidities and mortalities due to these conditions [3].

The Johns Hopkins Nursing EBP conceptual model that was developed by Johns Hopkins Hospital and the Johns Hopkins University School of Nursing will be used to guide this study. The model aims at ensuring that current research findings are incorporated quickly into patient care [14]. This model addresses three domains of professional nursing: nursing practice, education, and research. It also incorporates use of available evidence as a core component for decision making within these domains. Newhouse, Dearholt, Poe, Pugh, and White (2017), articulate that this model builds on three elements: practice question, evidence, and translation. The practice question is represented by the research question and meeting with the department staff to elaborate the need for the study (Figure 1) [15,16].

Translation will involve communication of the findings to the stakeholders, adherence to implementing the change and evaluation of the implemented guidelines.

LITERATURE REVIEW

Introduction

This chapter gives an overview of literature in relation to what other scholars have found about the study subject. The review of literature include brief highlight of the Uganda guidelines, and the study objectives. Different search engines have been used to obtain information such as , PubMed and HINARI. The search terms used were; adherence, challenges, health worker, guidelines, management, pre-eclampsia, eclampsia and Uganda. This search mainly involved peer reviewed journal articles, textbooks and policy statements from 2010 to date.

Uganda ministry of health guidelines

In Uganda, MOH of health adapted WHO guidelines and are being used as a recommendation for providing evidence-based care and treatment to patients with PE/E. The guidelines currently in use by the Uganda MOH were revised in 2016 and are merged in the volume of UCG 2016 that includes management of a long list of medical conditions. These guidelines can be accessed in soft copy or hard copy at no cost. They are mainly for use at health centres 2-4 and lower hospitals [17]. These guidelines mainly focused on the following areas:

- Diagnosis of pre-eclampsia and eclampsia by taking a thorough history, physical exam and investigation
- Management of pre-eclampsia and eclampsia
- Control of convulsions using of magnesium sulfate
- Control of blood pressure and fluid replacement using antihypertensive medication and constant Bp and fluid monitoring

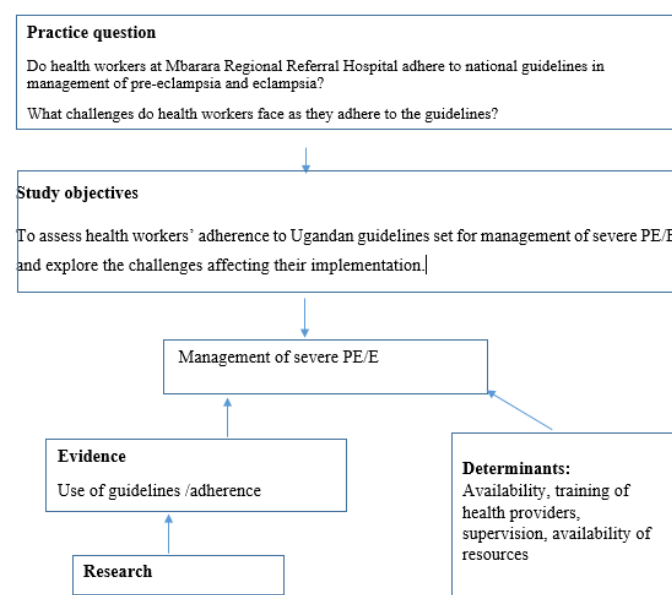


Figure 1) Shows conceptual model guided by John Hopkins evidence-based practice model.

- Delivery of the fetus as quickly as possible

Studies done inform of audit expanded these guidelines into several protocols to facilitate auditing the patient records to measure adherence in using the guidelines. In a study by Lumala et al. (2017) these guidelines were expanded into ten protocols to better assess health care providers adherence as they cared for patients with severe PE [13]. In another study done by Browne et al. (2015) in Accra Ghana expanded them into nine areas and were used in the criteria audit [6]. In contrast, Muchiri and his colleagues (2016) in their study done in Pumwani, Nairobi grouped these guidelines into six and used them to assess health care providers' adherence to guidelines for severe PE/E management [5]. It was difficult to compare these studies because of the variance in their tools, methods of data analysis though they all found that guidelines were not always followed and varied from study to study and country to country.

Health workers' adherence with guidelines

Several studies have examined how carefully health workers adhere to guidelines and have shown varying degrees of adherence [6,4]. Adherence to most protocols was mentioned in the articles reviewed by [11,17,13]. The same authors found out that the most adhered protocol was administration of magnesium sulfate (81% to 85%) and the least adhered to was monitoring for magnesium toxicity (12% to 18%).

Though similar findings were found, Browne et al. (2015) conducted a study in Accra Ghana among 93 patients with PE/E. However, their assessment was done using nine protocols among patient with complicated and uncomplicated PE/E yet their management is different. Ali et al. (2018), reviewed 53 patient and used twelve guidelines protocols both in the initial and the re-audit were same results cannot be obtained especially after the intervention [11]. According to Lumala and colleagues, ten protocols were assessed and great improvement was realized in the re-audit. A study reviewed by Talungchit, Liabsuetrakul, and Lindmark (2014) carried on assessment using nine indicators [18]. These studies were in form of audits, and the identified problems in guideline adherence were site specific and the solutions to the problems also depended on hospital level.

However, results from a retrospective study done in Kenya about adherence to the guideline for severe pre-eclampsia found that overall adherence was poor at 31.8% though there was variability of adherence on the different protocols [5]. The same study found history taking and examination was the most adhered protocol (67.8%) and the least being investigations (13.9%). This study was done in Nairobi a developed city though in a resource limited country so the results cannot be generalized for similar countries where their cities are not developed.

Other studies found introduction of an intervention improved use of guidelines, found great improvement in guideline adherence following education intervention [4,13,18]. Similar findings were noted in a criteria based audit study done in Uganda where adherence to protocol improved in the re-audit following implementation of education interventions. Although improvement is expected after an intervention Kidanto et al. (2012) in their study done in Tanzania found no improvement of above 50% on some indicators after an intervention. However, in these studies selection bias was a concern and Hawthorn effect since the respondents knew what interventions were being implemented and at the same time were the implementers [4].

Challenges to guideline adherence

Lack of human resource was found to be associated with poor guideline implementation [18]. A study done in Canada about barriers and facilitators to implementation of WHO maternal and perinatal guidelines found that health work force shortage influenced guideline implementation [19]. The same barrier is affecting most developing countries.

In another study, it was found that inadequate and poor clinical guideline implementation was common because of too much staff workload. This was found in a land scape analysis done in Parkistan where health care providers reported to have failed to perform due to too much work load [20]. In support to the above, Browne et al. (2015) suggested that when there are more staff members at work place, it allows them have more time for their clients [6].

Other scholars found lack of mentorship and supervision for staff was affecting their adherence to guidelines. Vogel et al. (2016) found that mentoring and supervision of staff was key to influence staff adherence to guidelines. Also Browne et al. (2015) reported that allocating tasks to staff and giving clear and precise instruction on what to

do improved their adherence to guidelines implementation. This challenge is more common in developing countries [19,6].

Other authors found insufficient education and training as other challenges to guideline adherence recommended that service providers should better be educated about the guidelines if they are to achieve success in their implementation. According to Browne et al., (2015), training health care providers on protocol use was found to increase awareness and this contributed to better guideline adherence [6]. Lumala and colleagues found that training health workers in form of continuing medical education was strongly associated with improvement in guideline utilization [13]. Active implementation of guidelines such as carrying out frequent local audits and on site staff education on protocols influenced staff adherence to guidelines [4]. Bigdeli and colleagues found that refresher trainings and education reminds staff and was necessary for improving their adherence to guideline usage especially the use of magnesium sulfate [17]. However, Vogel et al. (2016) found that training alone does not improve health workers' adherence to protocols but their knowledge and skill significantly fosters guideline implementation [19]. There has been improvement in countries that implement this but in developing countries like Uganda it might not be possible due to staff shortage as some staff are denied chance to attend training due to lack of personnel to leave on duty.

Another identified factor that increases health workers' adherence to guideline was provision of feedback about performance [13]. Providing feedback to staff after identifying the gap in protocol implementation greatly improved their adherence to protocol use [21]. Bigdeli et al. (2013), suggested that to improve adherence to guidelines use, staff should be asked to give feedback about their performance and this can help to improve on protocol adherence. However, Lumala and colleagues further put it that when feedback is implemented alone, it may not be effective to achieve the desired goal [13,17].

Insufficient monitoring equipment and stock out of some drugs was another challenge to guideline implementation for PE/E management. However, when drug availability and equipment were satisfactory the service providers implemented the guidelines. Talungchit and colleague noted that infrequent availability of medications hinder guideline implementation [18]. Rawlins et al. (2018), concluded that magnesium sulfate was always missing in some health facilities but also inadequate use of this drug was noted in some facilities despite its presence [22]. This study included health facilities that were not able to manage severe pre-eclampsia and were referring patients to the next levels of care for further management. Browne et al. (2015), found infrequent guideline use was due to lack of emergency medications such as hydralazine and frequent breakdown of the monitoring equipment. However, Bigdeli et al. (2013) found that a availability of drugs like magnesium sulfate depended on ward demand and other needed drugs were always available in both teaching and non-teaching hospitals surveyed. This is common with developing countries where staff fail to implement guidelines even when equipment is available [17,6].

Lack of displayed guidelines in the work place was also identified as another barrier to guideline implementation. Literature according to Wensing, Bosch, and Grol (2010) found that displaying guideline was essential for successful implementation of guidelines. They further reported that guidelines in close proximity can easily be referred to by health workers [23]. Bigdeli et al. (2013), found that written protocols were not available in most hospitals [17]. Barua and colleagues in their study done in India found that clinicians reported lack of guidelines on dose, timing and indications for Magnesium sulfate being the most challenge [24]. These studies were conducted in well to do cities but still the same apply to limited resources.

Summary of the literature

The burden of PE/E has remained high most especially in developing countries. Poor equipped health facilities have been attributed to inadequate staff adherence. Lack of human resource, lack of guideline training, inadequate mentoring and supervision of staff, lack of feedback on how the guidelines were implemented, staff workload where these guidelines could be implemented and lack of medical supplies plus drugs compromise the quality of health care given to these patients. Thus, institutions have continued to rely on their norms for managing PE/E cases rather than practicing evidence based care. According to studies conducted in Africa to assess the practice and actual care given to patients while minimizing potential bias, found guidelines being essential for standardizing and simplifying the care to be given to these patients.

MATERIALS AND METHODS

Introduction

The areas of discussion under this chapter include study design, study area, study population, sampling procedure, sample size, data collection, data management and analysis methods, quality control ethical consideration and data dissemination plan.

Study design

A mixed method study that employed retrospective review of patient medical record and qualitative interview of health workers was done. This mixed method was sequential where by quantitative data was collected, analyzed which later informed the qualitative data. Basing on the principle of triangulation, mixed method helped researcher understand the results of the study better [25]. Quantitative methods was used to assess health workers' level of adherence to guidelines and qualitative method was used to explore and obtain in depth understanding of the reasons why health workers are or are not adhering to the guidelines [26].

Study area

Mbarara Regional Referral Hospital (MRRH) was used as a study site for this research. It is a government founded health facility, backed by MOH Uganda and a major referral center in southwestern Uganda. It is situated in Mbarara Municipality, about 286 km south west of Kampala the capital city of Uganda. The hospital has an estimated bed capacity of 600, and serves a population of about 4 million people from 10 districts (MRRH records, unpublished). It also receives patients from neighbouring countries like Rwanda Congo and Tanzania. The hospital has many departments where about 1200-1500 patients are seen on daily basis. The obstetric department has three units: pre-natal, labor and post-natal respectively. On average, the hospital registers about 12,000 deliveries per year [27]. The In-patients with severe PE/E are admitted and managed by health care providers in the obstetric, ICU and their records kept in the registry department. These health care providers who care for patients with PE/E are of varied qualifications from the level of specialists to certificate nurse/midwife. When the patient with severe PE/E come in a critical state or condition worsen while already on ward they are admitted to ICU for adequate monitoring and specialized care. Once the patients stabilize, they are sent to obstetric ward for continuous management. MRRH is preferred because many patients with severe PE/E are seen there and is the only referral centre with ICU in the south western region.

Study population

Quantitative data: Charts of Women who were admitted to MRRH with a diagnosis of severe PE/E from 1 January 2018 to 31 December 2018.

Qualitative data: All Health workers on the maternity and ICU units who provide care to women with severe PE/E at MRRH.

Inclusion criteria: Only charts of women who were admitted with a diagnosis of severe PE/E to MRRH from 1 January 2018 to 31 December 2018 will be considered.

Exclusion criteria: Quantitative: Charts of women with diagnosis of severe PE/E that did not have a minimum of five of a selected criteria of 10 will be considered incomplete (refer to appendix I).

Sampling

Quantitative data: The sample was drawn from all charts of women admitted with severe pre-eclampsia and eclampsia to MRRH from January 1, 2018 to December 8, 2018. Sampling of all the medical records for the entire sample frame (100) was done. The charts were checked and only those meeting the inclusion criteria were selected for the audit.

Qualitative sampling: Purposive sampling was used to select health workers from obstetric and ICU departments who participated in the interview. This sampling method was used because it helped the researcher to select groups of individual who were knowledge and have experience about the study topic [28].

Data collection tools

Quantitative data: Developed criteria checklist guided by literature and the Pritchard formant of the guidelines for management of severe pre-eclampsia (refer to appendix I) the information for each record was recorded. Records without adequate information were excluded.

Qualitative data: A pre-designed semi structured interview guide was used. The interview questions reflected knowledge of guidelines, reasons

why individual may or may not adhere to the guidelines and possible interviewees' recommendations or solutions to address the problem.

Data collection procedure

Quantitative: Permission from the review board and then from the Hospital Director was sought. In turn the researcher explained the study to the head of obstetrics, area managers, and ward in charges. The Records Office was notified of the planned record audit. The researcher was helped by the records officer to identify the cabinets where the medical records for 2018 were stored. The records were checked by the researchers one by one to identify those with severe PE/E as the diagnosis. Each file was reviewed using the developed criteria audit checklist until the required sample was reached. At the time each record was reviewed, a list was kept of the chart numbers and a corresponding research number assigned. This list was invaluable in relocating records if needed and carefully kept it in a safe locked place.

Qualitative: An interview guide developed that consisted of open ended and a few close ended questions was used to collect data. The questions were mainly looking for challenges to Uganda guidelines implementation for management of severe pre-eclampsia and the possible ways to address these challenges. The researcher purposively selected health workers from the two departments. Then the researcher arranged with each participant when to conduct Face-to-Face interviews with each identified participant. All the participants met the researcher in a private location and according to their convenience. At the time of the interview each participant was given a verbal overview of the project, asked to sign a consent form to participate, and encouraged to openly share ideas. Each participant willingly shared with the researcher for 20-30 minutes. The researcher led the discussion, tape recorded the discussion and generally observed the non-verbal communication from each person. Data collection continued until redundancy point [29]. This was reached after interviewing 8 participants.

Data management and analysis

Quantitative data: Data were treated with utmost security; the checklists were kept under lock and key and only accessed by the researcher. All data were assigned numbers with personal identifier removed to respect the confidentiality of the patient. Data was entered into an excel spread sheet, cleaned and analyzed using the Special Package for the Social Sciences (SPSS) version 25. Descriptive statistics were used to identify whether the Ugandan PE/E criteria were not met.

Qualitative data: Content analysis was used and this helped the researcher to organize the data and be familiar with the data as described by Gray, Grove, and Sutherland (2017) [30]. At the end of every interview the research played back the audio taped information and the interviewee made clarifications were the information was not clear. Transcription of data was done where the researcher had to listen and re-listen to the audio taped information and reviewing the key notes wrote during the interview to generate meaningful data. Reading and re-reading of the narratives of the participants was done to ensure understanding of the whole data. Phrases with similar meaning were noted, differences and contradictions coded. Phrases with similar meaning were identified and coded with the same color then grouped into sub categories and then grouped to form the larger category.

Quality Control

Quantitative: Validity and reliability: The items in the checklist were developed based on Ugandan guidelines set for management of severe PE/E. The developed checklist was subjected for review by experts: a senior midwife and 2 physicians in the obstetric department. Pre-testing of the checklist was done on charts for 2019 at MRRH to check for appropriateness of content and ability to collect data that is relevant to the study. Adjustments were made in the tool after the pre-test to suit the study purpose. Since the investigator collected data herself, checking of the checklists was done before returning the patient's chart for filing to ascertain completeness of data. Then data was entered, cleaned and cross-checked before actual analysis.

Adherence was measured basing on number of items filled as per the checklist as guided by the literature [13,31]. The checklist contained 10 items and charts with at least $\geq$ five items filled in the checklist meant some adherence and then ≥ 7 to 10 good adherence to PE/E management guidelines.

Qualitative: Rigors of the Study: The assessment of trustworthiness in qualitative research relies on the four principles of credibility, transferability, dependability, and confirmability [32].

Credibility: Identifies how true the findings of the study are. This means

that the data collected was a true representation of participant's opinion in regard to challenges faced as they comply with the guidelines. This was achieved by establishing a clear rapport with the participants and spending enough time with the participants as planned.

Dependability: this describes how stable are the findings of the study. For this study, the interview guide was used to collect information in relation to the research questions that base on the already existing literature.

Conformability: refers to the similarity about variables. In this study, it was ensured by evaluating the interview questions so that they remain open ended and not leading. Use of codes was ensured for participants so that collected data is not mixed up.

Transferability: describes whether the findings from one study can be transferred to a similar context. It was attained by describing the study methods and findings, use of an adequate sample and reaching data redundancy during data collection.

Ethical considerations

The study proposal was submitted for approval to the Faculty Research Committee (FRC) and MUST Research and Ethics Committee (REC). Administrative clearance to conduct the study was sought from the Hospital Director. Consent for quantitative data was not necessary since the data was collected retrospective. However wavering for the informed consent before data collection was very essential.

Informed consent was obtained from participants before data collection after thorough explanation. No patient names were captured on the checklists to ensure the information collected is kept confidential. One-to-one interview was conducted in a private place and participants' names was not captured anywhere.

Dissemination of results

The study results will be compiled into a dissertation and defended publicly. Secondary the results of this study will be shared among the staff on obstetric and ICU departments. Copies of the dissertation report will be presented to the Department of Nursing, MUST main library, MRRH records and obstetric department, DHO's office Mbarara district because it is where MRRH is situated. In addition, the study results will be shared among the stakeholders in order to help in planning and formulation of intervention strategies aimed at reducing maternal and newborn death resulting from severe PE/E. Also the results of this study will be presented in a wider audience such as research dissemination conferences and as well be published in appropriate journal.

Study limitation

The researcher had a challenge of incomplete records even when the intervention was done. This limitation was explained in the interview held with the health workers where they described what they do and why what is done sometimes is not documented.

ANALYSIS AND PRESENTATION OF RESULTS

This chapter presents the results and analysis of the data. The study retrospectively reviewed 72 medical records of Mbarara Regional Referral Hospital to assess adherence to Uganda Ministry of Health guidelines for severe pre-eclampsia and eclampsia. In addition, qualitative data was collected to examine the challenges to adherence and implementation of national guidelines for the management of severe pre-eclampsia and eclampsia. Eight key informant interviews were conducted (8 nurse/midwives) and three themes emerged: lack of time, lack of resource, and lack of clinical audit and feedback.

Retrospective quantitative medical record review

A total of 72 records were reviewed for this study and data extracted to assess adherence to Uganda Ministry of Health guidelines. A sample frame of 100 records for entire period 2018 was used. By the help of the records office, the cabinets containing all records for 2018 were identified and reviewed one by one. The researcher checked one by one to identify those that were having a diagnosis of severe pre-eclampsia/eclampsia. A total of 89 files was made and only got 72 files met the inclusion criteria. A predesigned checklist was utilized to collect the data, and the data was then organized to calculate the frequencies, percentages and mean for the categorical data.

The majority were in the age bracket of 15 years-34 years 59 (82.0%). The mean age was 25 years. Prime gravida were the majority 29 (40.3%) and those with more than four deliveries contributed the smallest percentage (12.5%).

Most of the charts 65 (90.3%) had severe pre-eclampsia as the diagnosis, with only 7 (9.7%) cases of Impending eclampsia and eclampsia.

The records reflected that baseline blood pressure was the most common measurement taken at admission with 70 (97.2%). Sixty (60) women (83.3%) had their pulse rate recorded. The recording of respirations, temperature and convulsion status was low 29 (20.3%).

The specific guidelines reviewed consisted of ten parameters that documented care for women with eclampsia or preeclampsia. Five (5) parameters of the 10 standards of care were better adhered to.

The most adhered protocols of the ten items was anti-hypertensive therapy started within 20 minutes of diagnosis (72, 100%) and magnesium sulfate administration (67, 93.1%). The majority of the charts reflected that 54 women (75%) were not immediately attended by physician on their arrival to the hospital. Once admitted 37 women (51.4%) had their blood pressure monitoring per protocol of every 15 minutes. Urine testing, using the dip stick within 30 min of patient arrival occurred with 51 (70.8%) of the women reviewed. Performance of the deep tendon reflex test and respiratory monitoring every 2 hours for 24 hours was the least adhered to protocols with indication that 27 (37.5%).

Qualitative data analysis

In order to better understand the challenges to implementation of the guidelines by health workers, eight face to face interviews were conducted with the departmental/ward heads and senior midwives/nurses at MRRH the fourth week of July from 24th to 30th 2019. The key informants were purposively selected from Maternity (5) and ICU (3) wards at MRRH. The results are presented in two categories: demographic characteristics and themes that describe the challenges to implementation of national guidelines in management of severe PE/E.

Demographic characteristics of participants

Of the eight health workers interviewed more than a half were aged 41 to 50 years, the majority were females (6), and six were senior midwives. Most of the participants had 10 to 14 years of experience.

Challenges to adherence and implementation of national guidelines

Three Categories emerged. The three were: insufficient time, inadequate resources, and lack of clinical audit and feedback.

Category one: Insufficient time

This category of insufficient time emerged from the three sub-categories: heavy workload, number of patients seen, and consultation time.

Sub-category One: Workload

The midwives seemed to understand the importance of adherence and implementing the guidelines for management of severe pre-eclampsia/eclampsia. However, justified their inadequacies to workload and they illustrated that insufficient time incapacitated them from adequately assessing, document their findings and educating patients.

"...Maybe like today we have five mothers and I was alone in post-natal ward so seeing all the mothers and doing the ideal may not be adequate...too much work can also lead to not adhering to guidelines," (senior midwife 1)

"...I think the full adherence to the guidelines for severe pre-eclampsia management adds on a burden on the already exhausted midwife... surely it's too much you can't remember documenting in the file" (Senior midwife 3)

To address this, participants suggested that if the district head would be brought on board, this would help the hospital link up with the lower facilities such that management of these patients is initiated before referral to prevent the worst complications.

"For example, one time a mother was referred from Itojo Hospital and came in convulsing. What was the problem? ...mother had not been given magnesium sulfate before transfer and yet the guidelines are clear. Why? The ministry of health availed these guidelines to all health facilities therefore all staff involved should also adhere in implementation of these guidelines, but it the issues to be discussed with the DHO'S of the neighboring district to take action...this can reduce on our workload here in the hospital when patients come in a bit stable" (Senior Midwife 4).

Sub-category Two: Number of patients seen

The increasing number of patients with severe pre-eclampsia/ eclampsia

was highlighted as a significant barrier against adherence to guideline. The majority of the participants claimed that many of professionals were enforced to shorten the consultation time due to the large number of daily patients seen.

The participants felt that there was an urgent need for more manpower to manage these many cases.

"...Maybe the reason could be of course there is no negligence may be because of, I can't say there is negligence in pre-eclampsia /eclampsia because if a mother comes with high blood pressure with fits you need to act immediately but these days the cases are many, we get overwhelmed !!!." (Senior Midwife 2)

"Maybe it's not because they are not adhering. It is because like as we are having over population these days, the over whelming number of patients with pre-eclampsia, like you are working on this mother there comes another mother with fits. That one can also hinder you or delay you on registering them." (Senior midwife 1)

Sub-category three: Consultation time

Inadequate consultation time was viewed as another challenge to proper guideline adherence. The participants claimed that doctors are forced to shorten the consultation time due to the large number of patients. Some participants claimed that the doctors spent less than 2.5 minutes reviewing the patient. They believed that such contact time is not enough. They rush to go to see other patients waiting either in theatre or outpatient clinic.

"The doctor reviews the patient hurrying that other patients are waiting in maternity ward. If the doctors had time, they would give the drug themselves during the time of consultation to avoid the delay." (Senior Nurse 5).

"These days we see try to provide standardized care to all patients. Sometimes the doctor is forced to give like five to seven minutes for each patient and prescribe only... but we try our best and then rush to see other patients waiting outside..." (Senior midwife 8).

Category two: Inadequate resource

This theme emerged from two categories: human resource and material resource

Category one: Human resource

Some participants described that the shortage of staff was an obstacle for implementation of national guidelines for the management of severe pre-eclampsia /eclampsia. Participants suggested that department workload analysis be done such that more staff could be allocated to work in this busy departments (one midwife to twenty five mothers).

"...It is so great to have the pre-eclampsia guidelines, they guide us or other people on how to provide evidence -based care, but shortage of staff will always be a great challenge hindering implementation of these guidelines, how can one adhere to the guideline when you are one person caring for twenty five people?" (Senior Midwife 1)

On this issue the some participants' answers were in inform of suggestions to address the above challenge.

"...for example, the incharges should look into it and write to the senior principal nursing officer requesting for more staff from other departments that are less busy. Surely...we over work..." (Senior Midwife 3)

Category two: Material shortage

Specific issues raised by participants was stock out of drugs and testing kits. Although the care takers assist with supplies when they are out of stock, sometimes some do not have the money to buy the supplies and this hinders guideline implementation and the care given to the patient.

"Stock out of drugs if there are no drugs in stock like in MOH guidelines or supplies that sometimes can hinder guideline implementation. Because patients attendants have to go and buy. Instead of losing the mother they can go and buy on open market and then we manage" (senior midwives 6).

How do you expect the doctors to comply with the recommendations when a full blood count cannot be done in the hospital lab? We try our best. Urine strips are lacking on the ward and yet the test is simple, even the midwives can do it themselves." (Senior Midwife 4).

"...Where are the test kits? ... So doctors order and we tell the caretakers to take samples to town for testing and those without money cannot do such

a test" (Nurse 5).

Category Three: Lack of feedback and clinical audit

Lack of feedback emerged from three sub-categories namely clinical supervision, direct observation and file review plus feedback.

Sub-category One: Clinical supervision

One participant commented that the area managers do not adequately supervision the junior staff who may not know what to do because they are always busy.

"Some supervisors do their jobs in the improper way...they simply want to discover errors and blame others" (Senior nurse 5)

Sub -category two: Direct Observation

Contrary to the above, one participant believed that severe pre-eclampsia or eclampsia being emergency conditions require everyone to be involved in the management so that the mother stabilizes so fast before complication arise.

"When for example a case of pre-eclampsia and eclampsia is received, one has to shout for help. I have to move around the ward when a case of, I mean severe pre-eclampsia or eclampsia comes, the bell is rang and the staff gather to help, we assign them roles and we work as a team. Once the patient stabilize we go back to our routine duties and assign a nurse to monitor the patient" (Senior midwife 1)

Sub-category three: File review and feedback

The participants seemed to attribute their failure to adherence as lack of regular patient audit. Though the department tries reviewing patients' file and giving feedback, it is not regularly done. Participants admitted that even their feedback is limited to only providing some clinical comments that rarely cannot change one's professional behavior.

"...Yes when patients improve on this ward they are sent back to maternity ward, we don't follow them up to get feedback about the care that was provided. So we may not know if the practice was differing from the guidelines because for us we do what doctors order" (senior nurse 8)

"...oooh...yah it can be said we don't follow the guidelines when managing our patients with pre-eclampsia but this is not the case with us at MRR...quite often we rely on the report from the registry department to monitor our performance so we cannot tell whether guidelines were adhered to or not..." (Senior Nurse7).

DISCUSSION AND CONCLUSION

The findings of this study shows overall adherence towards the standard of care was 50%. Though some aspects of the guidelines were better followed than others, Lumala and colleagues found less than 50% adherence during the initial audit that improved after interventions to above 50% [13]. These results were in contrary to a study conducted at Pumwani hospital in Kenya where over all adherence was poor with a mean adherence of 31.4% [5]. Their results also differ from a study done in Accra Ghana where mean adherence was found range from 15%-85% [6]. These studies assessed for challenge to adherence quantitatively were their results depended on their targeted challenges sent in the questionnaire than getting open answers from the participants own view.

General characteristics

The finding of this study revealed age was significant in the development of severe pre-eclampsia /eclampsia with a mean age of 25 years. This concurs with the result of the study done in Parkistan where mean age was 25years. This is a true finding because age is a known a risk factor for pre-eclampsia development. However, the disparity arises in the time of its onset were age greatly above 35 years is a high risk for pre-eclampsia development.

This study found low parity significant at 29 (40.3%) with mean of 2. Similarly, Gold et al found similar findings in a systematic review for antenatal booking of pre-eclampsia mothers [33,34]. The results were in contrast with the findings of a study done in Parkistan where mean parity was 1.4 [6]. This probably can be related with the theory of placental development and hormonal changes during pregnancy which pregnant mother experience.

Adherence to guideline implementation

Our first criteria of patient be seen by the physician with 20-30 minutes of arrival to the hospital was poorly done standard of care 18(25%). This finding differ from Lumala et al where it was improved from 86.7 in the

initial audit to 97.7% [13]. Similar finding were acknowledged in the study done by Brown et al with 98% adherence [6]. The difference in these result could be due to what the staff suggested in the qualitative interview that overwhelming number of patients seen by one doctor, too much work load and burn out or senior residents on ward who manage the cases and do not inform the consultants.

The charting of blood pressure in this study was at 99% but other vital signs like Pulse rate, temperature, respiration and convulsions were significantly different. However, the monitoring of BP every 15 minutes was 51.1% which is too low compared to the 99% taken on arrival. These results were slightly different from what Lumala et al found where charting of the blood pressure was at 79.4 [13]. This can be explained by what the health workers mentioned in the qualitative interview that doctors see the patients on their arrival, take vital signs and document them in the files but due to too much work subsequent patient monitoring is not regularly done due to lack of time. Therefore, it is easy to have vitals taken and recorded on admission and difficult to continuously monitor patients' condition always due limited human resource to perform this task.

Administration of the anti-hypertensive treatment was the best protocol done (100%). However, in another study low adherence to this protocol during the initial audit and the re-audit was note (13,19.4% and 30, 68%) [13]. These findings were still in contrary with those found by Ali and his colleagues where adherence to this standard of care was at only 29% [11]. This could be due to the fact that severe pre-eclampsia being an emergency condition medications are administered and document immediately. The use of magnesium sulfate as a drug of choice to manage severe Pre-eclampsia showed much higher usage of 67 (93.1%) compared to other countries. The result of this study are slightly high than most results in the other studies. A study done in Pumwani, found overall usage at 40%. This percentage usage in Muchiri findings was slightly lower than 44 % found by Lumala. Being the first line drug in management the management patent with severe pre-eclampsia if the drug is available would be expected at 100%. In other studies, the results obtained was far from 100% where a score of 81% loading dose of magnesium sulfate was administered on admission [11,13,6].

The adherence to Fetal heart rate monitoring every 30 minutes when the diastolic blood pressure is >110mmHg was at 62 (86.1%). This finding was higher compared to What lumala et al found during the initial audit and which slightly improved in the re-audit (1, 2.7% and 2, 37.5%). This probably could be that, health workers become busy and fail to regularly monitor or do not understand the value of having this standard of care documented.

The criteria on urine deep stick done within 30 minutes of arrival and Urinalysis within 2 hours of arrival was found to be at 51 (70.8%). This was slightly lower than what Lumala and his colleges found at 44 (81.8%). However this difference seem not very significant. In another study conducted in kenya, the finding were slightly lower at 61.1% [13,5].

Monitoring for deep tendon reflex tests and respiratory rate done every 2 hours for 24 hours was poorly done at 27 (37.5%). Lumala et al found better adherence of 97.7 % [13]. This difference could been due to differences in the study setting where Lumala (et al) conducted their study in a missionary hospital whose patients are few compared to Mbarara Regional referral hospital and thus allowing time for thorough patient re-assessment and monitoring.

Testing of full blood count, renal and liver function tests within 24 hours were largely consistent with the guideline recommendations with up to 98%. These results were actually higher compared to findings by Muchiri at Pumwani hospital but were almost similar to what Lumala et al found (93.2%).

Administration of dexamethasone in all patients whose pregnancies were estimated to be 28 weeks - 34 weeks was at 51 (70.8%). This was slightly lower than 87% that was found in a study conducted at St Francis nsambya. The study noted that in some files standard of care was not documented as the gestation age was above 34 weeks and this could account for the differences [13].

Plan for delivery within 1hours when the decision is made was at 81.1% in this study. In a study done in St Francis nsambya hospital found slightly lower percentage of 37% even after an intervention. This could have been due the difference in sample size, study setting and presence of doctors to influence this decision because MRRH is a teaching hospital

and have many house residents who help when the consultants are busy.

Challenges to guideline adherence and implementation of national guidelines for management of severe pre-eclampsia

The results below describe the comparison existing in literature about the discussed categories and sub-categories that emerged from the analyzed interviews with the nurses and the senior midwives.

Lack of time

Lack of time due to heavy workload was qualitatively perceived as the most challenge to guideline implementation among health workers. The participants felt that there was not enough time to deliver according to pre-eclampsia/eclampsia guidelines. Similarly, results of the study done in Canada revealed that increased workload and time constraint affect guideline adherence. In another study, it was revealed that higher provider workload potentially hindered patient care [18,19,20].

In another study, time constraint decelerated healthcare providers' implementing of the guidelines such as vital sign monitoring, administering medication. Our findings further suggest that participants shortened their consultation times to cover the large number of patients [18].

A recent study done in Siaya county in Kenya revealed that spending more time with the patients was associated with good compliance to guidelines (100%) than taking short time (7.40%) [35]. The same study concluded that shortening of consultation time is likely to adversely affect patient care and physician workload. However, consultation time differ across the world. Therefore, it is highly suggested that to better minimize barriers to implementation of the national guidelines for management of severe pre-eclampsia, busy departments need to have more department more health workers so as to perform according to the standards.

Lack of resources

Participants put that inadequate resources encumbers guideline adherence and implementation. Shortage of staff and Lack of supplies such as medicine and laboratory tests reagents were the most mentioned challenges.

Considerably, in Uganda's setting where resources are limited there has been inconsistency in continuous supply of logistic and hence a challenge to implementation of the guidelines. Due to this, health workers send patients' care taker to buy the logistics from open private pharmacies but on some occasion some cannot afford buying the needed items thus a limitation to patient care and guideline implementation.

Lumala and colleagues in a study conducted in central Uganda Supposed that, availability of medical supplies directly influenced staff adherence to the guideline and significantly deteriorated when the supply was not good. Similar findings were noted in a study done in Siaya country in Kenya were shortage of staff and lack of essential commodities affected staff performance according to guidelines [13,35].

In a multi- country study conducted revealed that many low income countries and middle income countries lack resources in form of medical supplies like magnesium sulfate affected better patient care [36]. Although lack of resources was mentioned as a challenge to national guideline implementation, the decision makers are strongly invited to plan effective ways of ensuring that logistics for emergency conditions are reserved.

Lack of feedback and clinical audit

The health workers highlighted that lack of feedback and clinical audit was a hindrance to pre-eclampsia and eclampsia guideline implementation. This finding could be attribute to the concept that supervisors would focus on detecting errors and just blaming others instead of coaching, mentoring and training them [4].

It was further mentioned that lack of feedback and clinical audit affect guideline implementation. This was supported by a study done in St Francis nsambya Uganda where they found improvement in guideline implementation after giving feedback to health workers. However, Dupont and his colleagues do vary in their finding that providing feedback alone does not help improve adherence to guidelines [13,37]. Other studies also revealed that clinical audits significantly impact on health services positively than those services without audit. However, other studies noted that clinical auditing and effective feedback impact on care depended on who provides the feedback [4,13,17].

According to Ivers et al in their systematic review, they concluded that feedback may be more effective when “baseline performance is low, it is provided more than once, it is delivered in both verbal and written formats, the source is a supervisor or colleague and when it includes both explicit targets and action plans” [21].

CONCLUSION

In this study, adherence to administration of anti-hypertensive with 20 minutes of patient arrival to the hospital was generally good because all patients got their treatment as recommended by WHO. However, some patients missed to be seen by obstetrician within 15-30 minutes of admission. Some other physical assessment procedure such as monitoring of deep tendon reflexes and respiratory rate were not adequately recorded in patients' case notes. The optimal adherence to guidelines was mainly influenced by inadequate resources especially human resource and participants reported to lack timely feedback.

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