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Original Research Article

Trends of critical care management of obstetric patients in a tertiary hospital in sub-Saharan Africa

Fidelis A. Onyekwulu[1]*, Tochukwu C. Okeke[2]

[1]Department of Anaesthesia, University of Nigeria Teaching Hospital, Ituku Ozalla, Enugu, Nigeria
[2]Department of Obstetrics and Gynaecology, University of Nigeria Teaching Hospital, Ituku Ozalla, Enugu, Nigeria

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***Correspondence:**
Dr. Fidelis A. Onyekwulu,
E-mail: faonyekwulu@yahoo.com

ABSTRACT

Background: The maternal mortality rate in sub-Saharan Africa is high compared to other regions of the world. Management of critically ill obstetric patients is very challenging. We therefore evaluate the trends, clinical characteristics and outcome of the obstetric patients admitted into the intensive care unit of a tertiary hospital in sub Saharan Africa.
Methods: This was a 9- year retrospective study carried out at the multidisciplinary Intensive Care Unit (ICU) of a University Teaching Hospital which serves as a referral centre for the south east region of the country. Data were collected from the patients' record, ICU admission and discharge register. Also collected was data concerning labor ward admission and deliveries. Data was analyzed using SPSS Version 17 (SPSS Inc., Chicago, IL, USA).
Results: The total admission into the ICU during the study period was 1243 patients of which 73 (5.87%) were obstetric patients. They were between the ages of 17 and 54 years with mean of 32.05±5.96 years. The total number of deliveries within the period was 11224 (1247 per year). The commonest obstetric cases admitted into the ICU were (pre) eclampsia 28.8% followed by obstetric hemorrhage 24.7%. The overall mortality rate in this study was 39.7%. The commonest intervention carried out in the ICU was mechanical ventilation.
Conclusions: The two leading indications for ICU admission and maternal mortality are (pre)eclampsia and obstetric hemorrhage.

Keywords: Critical care, Intervention, Obstetric patients, Outcome

INTRODUCTION

Maternal morbidity and mortality are a topical issue world over and management of critically ill obstetric patients is very challenging to the critical care specialist as well as the obstetricians. The maternal mortality rate in sub-Saharan Africa in high compared to other regions of the world. The lifetime risk of dying during pregnancy is 1 in 16 in sub-Saharan Africa, as compared with 1 in 2800 in developed regions.[1] After two decades of the Safe Motherhood Initiative, meaningful reductions in maternal mortality and disability during pregnancy and childbirth in developing countries have not been realized.[2] This could be attributed to the level of poverty, lack of well equipped facility where adequate health care can be easily accessible. Also, the populace is not well informed on what to do about their health situations.

Prevention of pregnancy related complications is the key to reducing maternal mortality and morbidity. Early presentation to a health facility and referral is paramount. When this is not the case, late presentation to a tertiary

level hospital would result in poor prognosis which eventually would reflect on the outcome in the intensive care unit.

The study was carried out to evaluate the trends, clinical characteristics and outcome of the obstetric patients admitted into the intensive care unit of a tertiary hospital in sub Saharan Africa.

METHODS

This was a retrospective study carried out at the Intensive Care Unit (ICU) of University of Nigeria Teaching Hospital (UNTH) Enugu Nigeria. It is a 9 year review of obstetric admissions in a multidisciplinary ICU from January 1, 2008 to December 31, 2016. The medical records were reviewed by trained staff using pre-established and piloted data extraction forms. The data extracted from patients' record, ICU admission and discharge register included socio-demographics characteristics (age, parity and booking status), admission diagnosis, interventions, length of ICU stay and maternal outcome. Also collected was data concerning labor ward admission and deliveries. The hospital is a 700 bedded referral centre for the south east region of the country and has a 5 bedded ICU and a 5 bedded high dependency unit.

The data were analyzed using SPSS Version 17 (SPSS Inc., Chicago, IL, USA), and the results expressed in descriptive statistics by fractional percentages, tables and charts.

RESULTS

The total admission into the ICU during the study period was 1243 patients of which 73 (5.87%) were obstetric patients. They were between the ages of 17 and 54 years with mean age of 32.05±5.96 years. Majority of the patients were between the ages of 26 and 34 years (Table 1).

Table 1: Patients' characteristics.

Characteristics	Number of patients	(%)
Age		
17-25	8	11
26-34	40	54.8
35-43	23	31.5
> 43	2	2.7
Parity		
Primigravida	45	61.6
Multigravida	28	38.4
ANC attendance		
Unbooked	44	60.3
Booked	29	39.7
Antepartum admission	6	8.2
Postpartum admission	67	91.8

ANC = Antenatal clinic

Table 2: Interventions.

Interventions	Frequency	(%)
Mechanical ventilation	31	42.5
Hypotensive agent	7	9.6
Inotropes	15	20.5
Blood and blood products	23	31.5
Anticonvulsants	8	11
Dialysis	3	4.1
Tracheostomy	4	5.5
Manual evacuation	2	2.7
Caesarean section	32	43.8
Obstetric hysterectomy	6	8.2
Exploratory laparotomy	14	19.2
Pericardiotomy	1	1.4
Mechanical ventilation	31	42.5

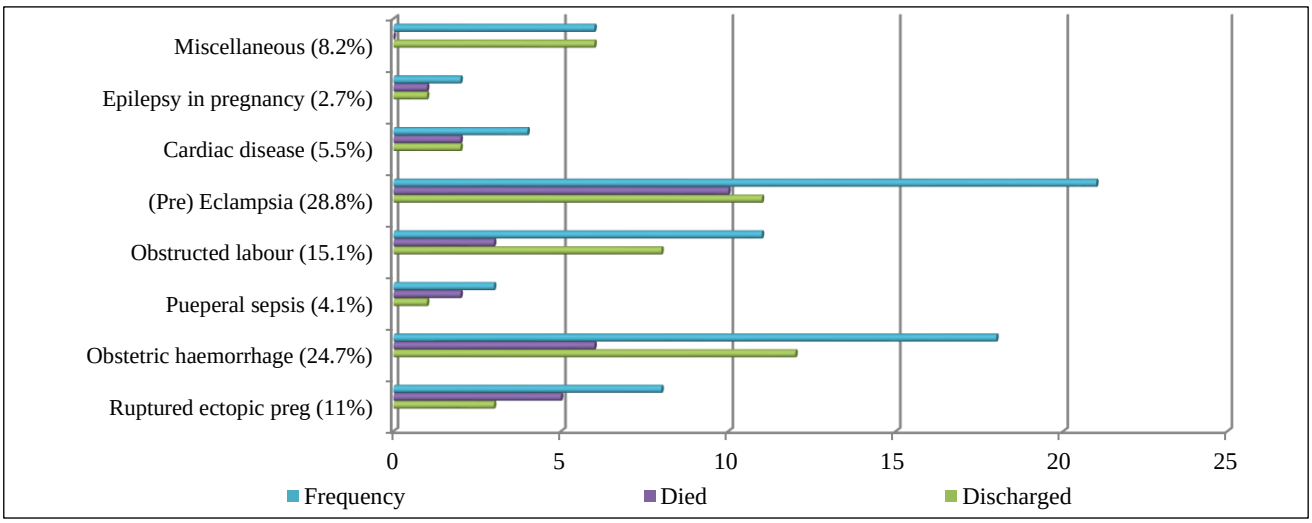

Figure 1: Trends of critical care management of obstetric patients (ICU admission, diagnosis and outcome).

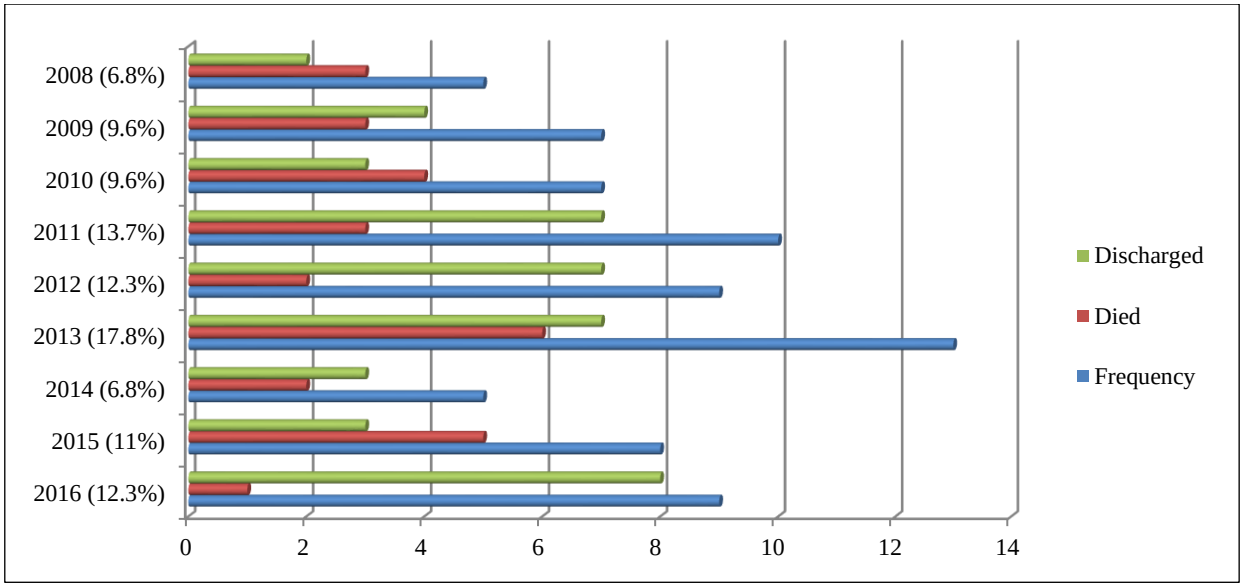

Figure 2. Trends of critical care management of obstetric patients (Year of admission and outcome).

The total number of deliveries within the period was 11224 (1247 per year). Obstetric ICU admissions constitute 0.65% of the total number of deliveries. The length of ICU stay was 1 to 44 days and a mean stay of 4.49±6.88 days. A total of 64.4% (47) of the patients spent 1 to 3 days in ICU, 27.4% (20) spent 4 to 7 days and 8.2% (6) spent more than 7 days.

he commonest obstetric cases admitted into the ICU were (pre) eclampsia 28.8% followed by obstetric hemorrhage 24.7% (Figure 1). Ruptured ectopic pregnancy constituted 11% of obstetric admissions; together with obstetric hemorrhage produced majority of obstetric ICU admissions related to maternal hemorrhage (35.7%). Miscellaneous included thyrotoxicosis (n=1), acute severe asthma (n=2), anesthetic complication (n=1) and diabetes mellitus (n=2). Majority (37%) of these cases were admitted through the accident and emergency unit of the hospital while 26.8% of the patients pass through the labor ward, others are antenatal 8.2%, postnatal (8.2%) and special care ward (9.6%).

During the study period 2013 witnessed the highest number of obstetric admissions (17.8%) and highest (6) maternal death (Figure 2). The overall mortality rate in this study was 39.7% (29); of which 34.4% (10) of these mortalities was seen in (pre)eclampsia, 20.7% (6) in obstetric hemorrhage and 17.2% in ruptured ectopic pregnancy. Most of the death recorded was in the first 3 days of admission representing 65.5% (19) of the mortality, followed by 4 to 7 days 24.1% (7) and more than 7 days 10.4% (3). The primary reasons for admission were: respiratory failure; unconsciousness and/or seizures; multiple organ failure and severe sepsis.

The interventions carried out on these patients are as shown in Table 2. Twenty one out of the 31 patients that were mechanically ventilated died while 8 deaths were recorded in non-ventilated patients. The hypotensive agent commonly used in this centre is labetalol while dopamine and/or norepinephrine were the inotropic agents used when the need arose. Fresh frozen plasma and platelet concentrate were the only blood products used in cases of Disseminated Intravascular Coagulation (DIC. 6.8%) and HELLP (Hemolysis Elevated Liver enzymes Low Platelet) syndrome (5.5%). Other comorbidity recorded includes severe sepsis (9.6%), acute kidney injury (6.8%), and cerebrovascular accident (1.4%). Exploratory laparotomy was done in cases of ruptured ectopic pregnancy (salpingectomy n=8), obstetric hemorrhage (n=5) and pueperal sepsis (n=1). Indication for hysterectomy was obstetric hemorrhage.

DISCUSSION

The two most common indications for obstetric ICU admission in this study was (pre)eclampsia 28.8% followed by obstetric hemorrhage 24.7%. This is similar to other studies.[3,4] Cases of (pre)eclampsia and its complications were prominent in this study; this included HELLP syndrome, DIC, seizures and acute kidney injuries resulting in renal failure. Therefore, it is not surprising that the highest percentage of maternal mortality was recorded in this group of patients. Both (pre)eclampsia and obstetric hemorrhage are the leading cause of maternal motality in the ICU accounting for more than half of the death recorded. Both are responsible for the majority of maternal mortality and morbidity worldwide.[5]

The overall mortality rate in this study (39.7%) was high when compared to studies from India (33.8% and 33.66%).[4,6] Although India is a developing country, the level of health care is invariably better than in sub

Saharan Africa which is also bedeviled with low socioeconomic status, lack of education and poor antenatal care. These factors are known to contribute to obstetric complications and outcome.[7] In the study by Hazelgrove JF et al in southern England 3.3% maternal mortality was recorded; and 4.9% mortality in the Netherlands was reported by Keizer JL et al.[8,9]

The majority (91.2%) of patients were admitted to the ICU postpartum. Caesarean sections were carried out on critically ill obstetric patients prior to admission into the ICU in order to save the life of the mother and baby. Sometimes the patient is transferred from outside the hospital with the mother already delivered of the baby and complications already set in. The frequency of postpartum admission is similar to the study by Al-Suleiman SA et al that reported 84.4%.[10] Early recognition of obstetric complications and referral to centres with ICU facility could minimize the prevalence of multiple organ failure and mortality in critically ill obstetric patients.[5] This was noticed in this study as about two third of mortality recorded was in the first 3 days of admission. The clinical state of the critically ill obstetric patients at admission into the ICU remains a major determinant of the outcome of ICU care.[11]

Maternal mortality in resource-poor nations has been attributed to the "3 delays": delay in deciding to seek care, delay in reaching care in time, and delay in receiving adequate treatment.[12] Organization, modern equipment and level of manpower development could also be responsible for the wide disparity in the mortality reported in this study compared to Europe and other developed nations.

It is noted that the number of deliveries reported in this study is 1247 per year. This is because the hospital is a referral centre and most of the deliveries in the country are carried out by traditional birth attendants whose training and level of competence is questionable as there is no structure in place for their training and regulation of practice. It takes skill to predict or prevent bad outcomes and medical knowledge to diagnose and immediately act on complications.[12]

The most common intervention carried out in the ICU was mechanical ventilation (MV). This is similar to the study by Vasquez DN et al that reported 41% intervention with MV.[13] Transfusion of blood and blood product as seen in the ICU is a very important intervention in the restoration of circulating blood volume and impaired coagulation; together with rapid control of bleeding is the main stay in management of obstetric hemorrhage.

Organ failure noticed in this series were renal failure requiring hemodialyses, cardiovascular insufficiency requiring fluid and inotropic support, DIC requiring blood and blood product transfusion, and respiratory failure requiring mechanical ventilation. Together with sepsis are prognostic factors for poor outcome. Mortality rate increases with increasing organ failure.[14]

The limitations of this study are the retrospective nature of the study and poor documentation of vital information such as scanty data on management outcome.

The two leading indications for ICU admission and maternal mortality are (pre)eclampsia and obstetric hemorrhage. Early detection of high-risk obstetric patients and referral to tertiary health care centre, close collaboration between obstetricians, intensive care specialists and anesthetists; and adequate resuscitation and supportive care sequel to ICU admission will go along way in reducing the prevalence of maternal morbidity and mortality.

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