Original Article

Critically ill obstetric admissions into a tertiary hospital's intensive care unit

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Abstract

Background: Intensive Care Unit (ICU) management is a critical care and may be lifesaving in critically ill obstetric patients, but mortality remains high in low-resource countries. **Objective:** To review obstetric admissions into a tertiary hospital ICU. **Design:** Retrospective descriptive study. **Setting:** The ICU of the University of Ilorin Teaching Hospital, Ilorin, Nigeria. **Subjects:** Women admitted to the ICU during pregnancy or within 42 days of the end of the pregnancy. **Materials and Methods:** A list of all eligible participants was compiled, the case files were retrieved and relevant data extracted; the results were presented in tables and percentages. **Results**: Obstetric patients constituted 12.3% of the total ICU admissions and 0.84% of all deliveries with 45.6% mortality; the mean age was 29.2 ± 5.4 years (range 18–42 years), mean parity was 2.0 ± 1.5 (range 0–6), 15 (28.8%) had no formal education, 39 (75.0%) were of low social class, 22 (42.3%) had no antenatal care, 41 (78.9%) were admitted for obstetric reason, and postpartum hemorrhage was the most common indication for admission (19 [36.5%]). In all, 44 (84.6%) were admitted postpartum, 45 (86.5%) had organ dysfunction at ICU admission, 36 (69.2%) had mechanical ventilation while the most common drug administered were antibiotics. **Conclusion:** Obstetric patients are important intensive care users, but maternal mortality remains high among them in low-resource countries despite the care received.

Key words: Critically ill, intensive care unit, obstetric admissions

INTRODUCTION

Management of critically ill obstetric patients is important in improving maternal health (MDG-5) by reducing maternal mortality from these illnesses. The profile of admission of critically ill obstetric patients has been shown to be similar worldwide;[1] however, there is a clear division in the mortality with rates of 0–9.4%[2,3] from developed compared to 33–52% in low-resource countries.[4-7] This wide gap is due to a combination of clinical and economic factors with illiteracy, poverty, lack of awareness about health complications, and social/behavioral factors[8] in low-resource countries while well-equipped labor wards, evidence-based practice, and effective insurance schemes have reduced mortality and improved outcome in developed countries. Available data from Nigeria and Kenya reported high mortality with obstetric hemorrhage, complications of severe preeclampsia/eclampsia, multiple organ failure, late presentation, and lack of antenatal care as major determinants of mortality among critically ill women.[4-7]

It has, therefore, become necessary to gather data on the outcome of the critical care in low-resource countries to more clearly define the profile and identify areas for improvement; this was the aim of this review.

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MATERIALS AND METHODS

The study was a retrospective descriptive study of critically ill obstetric patients admitted to the Intensive Care Unit (ICU) of the University of Ilorin Teaching Hospital, Ilorin, Nigeria from January 2010 to June 2013. The ICU is a multispecialized four bedded unit with facilities for multimodal parameter monitoring and functioning mechanical ventilators. It receives patients from all medical and surgical units in the hospital as well as referrals from other centers within and outside the state.

The ICU admission register was reviewed, and a list of all eligible women was compiled; the case files were then retrieved from the medical records department of the hospital for analysis.

The inclusion criteria were admission to the ICU during pregnancy or within 42 days of its termination and availability of the case file for review. Exclusion criteria were nonobstetric patients and obstetric patients whose case files were not available for review.

The data obtained included sociodemographic and obstetric parameters, indication and clinical state at ICU admission, the interventions and final outcome of ICU admission. The results were expressed in tables with percentages.

The data for the study was part of the result of an audit of ICU care in the hospital during the study period; institutional ethical approval was obtained before commencement of the study, sponsorship was by the researchers, and there was no conflict of interest in the conduct of the study.

RESULTS

Of the 731 patients admitted to the ICU during the study period, 90 were critically ill obstetric patients constituting 12.3% of ICU admissions and 0.84% (8.4/1000) of total deliveries; there were 41 deaths with mortality of 45.6%. However, 52 case files (57.8% retrieval rate) were available for review and included in subsequent analysis. The mean age was 29.2 ± 5.4 years (range 18–42), mean parity was 2.0 ± 1.5 (range 0–6), 15 (28.8%) had no formal education, 39 (75%) were of low social class, and 22 (42.3%) had no antenatal care [Table 1].

Obstetric indications were responsible for 41 (78.9%) while nonobstetric indications were in 11 (21.1). The two most common obstetric indications were massive postpartum hemorrhage in 19 (36.5%) and complications of severe preeclampsia/eclampsia in 15 (28.8%) while anesthesia related indications occurred in 6 (11.5%) and cardiac diseases in 4 (7.7%) of the women [Table 2].

At admission into ICU, 44 (84.6%) were postpartum, 43 (82.7%) had hypoxia, 26 (50.0%) had hypertension, 39 (75.0%) had tachycardia, while 45 (86.5%) had organ dysfunction [Table 3]. Twenty women had (38.5%) vaginal delivery, 29 (55.7%) had abdominal delivery, while 3 (5.8%) were postabortion.

In Table 4, the most common interventions at the ICU were oxygen administration in 37 (71.2%) and mechanical

Table 1: Sociodemographic characteristics of participants

Variable	Frequency (%)
Age (years)	
15-19	1 (1.9)
20-35	40 (77.0)
>35	11 (21.1)
Mean age	29.2±5.4
Level of formal education	
None	15 (28.8)
Primary	12 (23.1)
Secondary	9 (17.3)
Tertiary	16 (30.8)
Parity	
0	12 (23.1)
1	11 (21.2)
2-4	26 (50.0)
≥5	3 (5.7)
Mean parity	2.0±1.5
Social class	
Low	39 (75.0)
High	13 (25.0)
Marital status	
Single	2 (3.8)
Married	50 (96.2)
Antenatal care	
None	22 (42.3)
Care at study site	5 (9.6)
Care at other facilities	25 (48.1)

Table 2: Indication for ICU admission

Indication	Frequency (%)
Obstetric	
Complication of unsafe abortion	2 (3.9)
Amniotic fluid embolism	2 (3.9)
Puerperal sepsis	3 (5.8)
Severe preeclampsia/eclampsia	15 (28.8)
Massive postpartum hemorrhage	19 (36.5)
Nonobstetric	
Road traffic injury	1 (1.9)
Cardiac disease	4 (7.7)
Anesthesia related	6 (11.5)

ICU=Intensive Care Unit

Table 3: Parameters of participants at ICU admission

Parameter	Frequency (%)
Condition at ICU admission	
Postabortion	3 (5.8)
Pregnant	5 (9.6)
Postpartum	44 (84.6)
Oxygen saturation	
Normal	9 (17.3)
Hypoxia	43 (82.7)
Systolic blood pressure (mmHg)	
<90	5 (9.6)
≥140	21 (40.4)
90-139	26 (50.0)
Pulse rate	
60-90	13 (25.0)
>90	39 (75.0)
Presence of organ dysfunction	
No	7 (13.5)
Yes	45 (86.5)

ICU=Intensive Care Unit

Table 4: Intervention and outcome of ICU admission

Parameter	Frequency (%)
Interventions	
Defibrillation	4 (7.7)
Renal dialysis	4 (7.7)
Radiological imaging	5 (9.6)
Mechanical ventilation	36 (69.2)
Oxygen administration	37 (71.2)
Types of drug used	
Antiarrhythmic	1 (1.9)
Anticoagulant	4 (7.7)
Diuretic	8 (15.4)
Antiplatelet	9 (17.3)
Anticonvulsant	17 (32.7)
Antihypertensive	18 (34.6)
Inotropic drugs	27 (51.9)
Antibiotics	52 (100.0)
Outcome	
Died	25 (48.1)
Alive	27 (51.9)

ICU=Intensive Care Unit

ventilation in 36 (69.2%), the most common medication used were antibiotics in all the women and inotropic drugs (27 [51.9%]).

DISCUSSION

Critically ill obstetric patients constituted 12.3% of all ICU admissions in this study; this was higher than reports of 1.25–4.6% from low-resource[4-6,9] and 0.38–10% in developed countries.[1-3,7,8,10-16] This may be due to the higher frequency of obstetric ICU admission in this center which has the only ICU facility in two states and serves a large proportion of about four other neighboring states; thus suggesting a need for more centers. Critically ill obstetric patients constituted 0.84% of total deliveries; this compares favorably with 0.2–1.4% from low- resource[4,6,9] and 0.2–1.54% in developed[3,7,8,10,14-16] countries. This shows the similarity in the range of proportion of parturient requiring intensive care irrespective of the country despite the fewer facilities in low-resource countries.

The mean age was similar to reports from other researchers,[2,6,7,9,13] further emphasizing that these critically ill women were of reproductive age with 44.3% having one or no previous delivery similar to 45–66% by other authors.[6,9,15] This raises a concern for adequate intervention to salvage the life of these young women who are also productive members of the population.

There appears to be a relationship between nonantenatal clinic attendance and high mortality rate among critically ill obstetric patients. In this study, 42.3% had no antenatal care with 45.6% mortality compared to 50% nonantenatal care with 41.2% mortality in Ile-Ife, Nigeria[4] and 79.6% nonantenatal care with 52% mortality in Ibadan, Nigeria,[9] in contrast to 0% nonantenatal care and 0% mortality in Canada.[8] This implies that the higher the nonantenatal clinic attendance, the higher the mortality among critically ill obstetric patients.

In this study, most reports by other researchers in both low-resource and developed countries, the two most common obstetric indications for ICU admission in obstetric patients were massive postpartum hemorrhage and complications of preeclampsia/eclampsia.[3-6,9,11-13,16,17] This calls for a higher level of anticipation, birth preparedness, and complication readiness to address postpartum hemorrhage with adequate prophylaxis for those at risk and prompt intervention when it occurs to prevent massive hemorrhage. In addition, preeclampsia remains a disease of theories; greater attention must be dedicated in unraveling the cause, and by extension of an effective prevention of this disorder of pregnancy.

The high rate of cesarean delivery in critically ill obstetric patients is related to the underlying pregnancy complications necessitating emergency delivery as well as complications of the procedure. Thus, the 55.7% rate in this study is similar to the reports of 64%,[18] 76%,[7] and 85%[9] by other researchers.

Previous researchers have reported that majority of critically ill obstetric patients who needed intensive care were in the postpartum period with a range of 63–100%[2-5,7,13,16] similar to 78.9% in this study. This emphasizes the role of active labor monitoring for all women by skilled birth attendants who can identify complications and institute appropriate treatment or referral promptly before significant morbidity occurs.

The use of mechanical ventilator was employed in the management of 69.2% of patients similar to the reports of 21–63%[5,9,16-18] from other authors. This emphasizes the severity of the illness in these obstetric patients at presentation, the need for adequate equipment for patient care, and the attendant poor outcome when these are not available.

Antibiotics, antihypertensive, anticonvulsant, and inotropic drugs were among the commonly used medications in this study similar to previous reports.[7,8,17] The antibiotics are important in preventing infection, the antihypertensive, and anticonvulsants, especially in the management of preeclampsia and eclampsia, while inotropic drugs are useful in cardiac complications.

Maternal mortality in this study was 45.6% similar to 41.2% from Ile-Ife,[4] 52% from Ibadan,[9] and 48% from Enugu[5] all in Nigeria and 33% from Kenya[6] in contrast to 0% mortality from Canada,[8] Australia,[2] and Saudi Arabia.[19] This shows that maternal mortality among critically ill obstetric patients in low-resource countries remains high despite the similarity in the pattern of the illnesses. An explanation may be the few ICUs in low-resource countries and the limited availability of equipment will be needed to appropriately treat the illnesses.

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Conflicts of interest
There are no conflict of interest.

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