

Critical Care Obstetrics in a Developing Country

Ugochukwu Vincent OKAFOR¹, Efenae Russ EFETIE²

¹National Hospital, Department of Anaesthesia, Abuja, Nigeria

²National Hospital, Department of Obstetrics and Gynecology, Abuja, Nigeria

Received 20 June 2007; received in revised form 25 August 2007; accepted 13 September 2007;
published online 16 November 2007

Abstract

Objective: A retrospective review of the pattern of obstetric admissions to the general intensive care unit of the National Hospital, Abuja, Nigeria over a 5 year (March 2000 to February 2005) span was carried out.

Materials and Methods: The case files and the intensive care unit records of 54 patients were used to extract the relevant data.

Results: The records of 54 obstetric patients admitted to the intensive care unit (ICU) during the study period were reviewed together with 6063 live births, giving an ICU admission rate of 9.7/1000 live births in the hospital.

The average age of the patients was 29.84 years (range 17-40). Forty-four (81.5%) of the patients had eclampsia, five patients (9.3%) had severe pre-eclampsia. Two patients (5.55%) had obstetric hemorrhage while the remaining were admitted for postpartum cerebrovascular accident 1 (1.8%), severe postoperative respiratory distress 1 (1.8%) and septicemia 1 (1.8%).

Twenty of the patients (37%) received mechanical ventilation with the Newport ventilator, while 32 patients (59%) received oxygen therapy through intranasal prongs or cannulae. Two patients (4%) were on room air throughout admission. There were fifteen deaths during the study period, thirteen deaths in the eclampsia group (29.5% mortality in the eclampsia group), one death in the obstetric hemorrhage group (50% mortality in the obstetric hemorrhage group) and a death in the patient with septicemia (100% mortality). All admissions occurred in the postpartum period.

Discussion: The high maternal mortality in this study highlights the problem of critical care obstetrics in the developing world. However, unlike other studies, eclampsia was the predominant diagnosis at the intensive care unit admission. Late presentation of patients coupled with inadequacy of intensive care unit may have contributed to high maternal mortality in this study.

Keywords: eclampsia, critical care, intensive care unit

Özet

Gelişmekte Olan Bir Ülkede Kritik Obstetrik Bakım

Amaç: Beş yıllık (Mart 2000-Şubat 2005) sürede Nijerya Abuja'daki Devlet Hastanesi'nin genel yoğun bakım ünitesine yatırılan obstetrik başvuruların retrospektif olarak gözden geçirilmesi.

Materyal ve Metot: Hasta dosyaları ve yoğun bakım kayıtları dikkate alınarak 54 hastanın verileri kullanılarak sonuca varılmıştır.

Sonuçlar: Elli dört obstetrik hastanın yoğun bakım kayıtları çalışma boyunca 6063 canlı doğum verileri ile karşılaştırıldığında yoğun bakıma alınma oranı 9.7/1000 canlı doğum olarak belirlendi. Ortalama hasta yaşı 29.84 idi (17-40). Kırk dört hastada eklampsi (%81.5), 5 (%9.3) hastada da ciddi preeklampsi tablosu bulunmaktaydı. İki hasta (%5.55) obstetrik kanama, 1 (%1.8) hasta postpartum serebrovasküler hasar, 1 (%1.8) hasta ciddi postpartum distres ve 1 (%1.8) hasta da septisemi nedeniyle yoğun bakım hizmeti aldı. Yirmi hastaya (%37) Newport ventilatör ile mekanik ventilasyon uygulanırken, 32 hasta (%59) intranasal kanül veya maske ile oksijen tedavisi almış, 2 hasta (%4) ise normal oda koşullarında tedavi edilmiştir. Çalışma süresince 15 maternal ölüm gerçekleşti; 13 ölüm eklampsi grubunda (%29.5), 1 ölüm obstetrik kanama grubunda (%50), 1 ölüm de septisemi grubunda (%100) gerçekleşti. Tüm hastalar postpartum dönemdedi.

Tartışma: Bu çalışmadaki yüksek maternal mortalite, gelişmekte olan ülkelerdeki kritik obstetrik bakım sorunlarına dikkat çekmektedir. Ancak diğer çalışmaların aksine yoğun bakıma gelen hastalar içerisinde eklampsi en sık tanımlanan durumdur. Bu çalışmada, hastaların geç başvurması nedeni ile yetersiz yoğun bakım desteği almaları yüksek anne ölümüne katkıda bulunmuş olabilir.

Anahtar sözcükler: eklampsi, kritik bakım, yoğun bakım ünitesi

Corresponding Author: Dr. Ugochukwu Vincent Okafor

PO Box 1521, 234 Enugu, Nigeria

Phone : +234 42 31 50 40

: +234 42 25 25 73

GSM : +234 80 57

E-mail : uvkafor@yahoo.com

Introduction

It was reported that before the early nineties, there was a paucity of research work on the need for intensive care management of the critically ill obstetric patient (1).

Since then however, there has been increased research into this important aspect of maternal care (2,3). It is now believed that between 0.1 to 0.9% of pregnant women have complications requiring intensive care unit (ICU) admission (4).

This is often because of the need for organ support and the higher levels of medical care available in the unit. Some authors now advocate for a high dependency care unit for the continuous care of these patient (5). Pre-eclampsia has been the main diagnosis for the ICU admission in the more advanced nations, due in part to better antenatal care which may reduce the number of women that progress to eclampsia. This study seeks to find out the pattern of ICU obstetric admission and their management in Abuja, northern central Nigeria. Although, a similar work has been done in Southern Nigeria (6), we undertook this study because of the different socio-demographic factors (including cultural, dietary and climatic factors) in these major regions of the most populous African nation.

Materials and Methods

A retrospective review of obstetric admissions to the general intensive care unit of The National Hospital, Abuja, Nigeria over a five year span (March 2000-February 2005) was carried out.

The patients' case files and ICU records were extracted and reviewed. The data collected included the patients' demographics, admission diagnoses, duration of the stay in the ICU, parity, complications and maternal outcome.

Results

The hospital records of 54 obstetric patients out of the total of 664 patients admitted to the ICU during a 5 year study period were extracted and reviewed.

Table 1. Age distribution in obstetric patients admitted to the ICU

Age (years)	Number (%)
<17	0 (0%)
17-20	5 (9.2%)
21-25	9 (16.7%)
26-30	16 (30%)
31-35	18 (33.3%)
36-40	6 (11.1%)
>40	0 (0%)

Table 2. Parity of obstetric patients admitted to the ICU

Parity	Number (%)
1	31 (57.4%)
2	12 (22.2%)
3-4	4 (7.4%)
5	3 (5.6%)
>5	4 (7.4%)

There were 6063 live births giving an ICU admission rate of 9.7/1000 live births in the hospital.

The average age of the patients was 29.84 years (range 17-40). Table 1 show the patients' age distribution while the parity distribution is shown in Table 2. Table 3 shows the relationship between diagnosis and duration of stay in the ICU.

Forty-four (81.5%) of the patients had eclampsia, five patients (9.2%) had severe pre-eclampsia. Two patients (3.7%) had obstetric hemorrhage while the remaining were admitted for the following reasons; postpartum cerebrovascular accident 1 (1.8%), severe postoperative respiratory distress 1 (1.8%) and septicemia 1 (1.8%). The patient with post-partum cerebrovascular accident suffered a quadriplegia which was one of the complications suffered by the live patients in the group. The others were acute renal failure in two patients including one in mid-gestation in a patient with eclampsia and HELLP syndrome. There were two other cases of HELLP

Table 3. Relationship between patient diagnosis and duration of stay in the ICU

Diagnosis	Number of patients (%)	Average duration of stay in the ICU (days)	Min-max stay time (days)
Eclampsia	44 (81.5%)	5	1-43
Pre-eclampsia	5 (9.2%)	2.4	1-4
Obstetric hemorrhage	2 (3.7%)	3	2-4
Severe postoperative respiratory distress	1 (1.8%)	1	NA
Postpartum sepsis	1 (1.8%)	1	NA
Postpartum cerebrovascular accident	1 (1.8%)	1	NA

NA: not applicable.

syndrome in survivors and genital sepsis in another. The patient with quadriplegia had a CT scan which revealed cerebral oedema. The cost (about 400 US dollars per patient) of cerebral CT scans being prohibitive to routine applications, it has been difficult obtaining results on radiological diagnosis of possible cerebral oedema.

Twenty of the patients (37%) received mechanical ventilation with the Newport ventilator while 32 patients (59%) received oxygen therapy through intranasal prongs or cannulae. Two patients (4%) were on air throughout their admission.

There were fifteen deaths during study period, thirteen deaths in the eclampsia group (29.5% mortality in the eclampsia group), one in the obstetric hemorrhage group (50% in the obstetric hemorrhage group) and a death in the patient with septicemia (100% mortality).

The causes of death in the eclampsia group were HELLP syndrome (6 patients), disseminated intravascular coagulation (2 patients), and acute renal failure (ARF) in 2 patients. Septicemia, lobar pneumonia/heart failure and cerebrovascular accident accounted for one death each in the eclampsia group.

Abruptio placenta with disseminated intravascular coagulation was the cause of death in the obstetric hemorrhage group. Both patients with obstetric haemorrhage (abruptio placenta and major placenta praevia) were delivered by emergency Caesarean section.

All ICU admissions occurred in the postpartum period. In the antenatal period, the management approach would have been to stabilize the blood pressure, control convulsions and then deliver the woman by the most expeditious route.

The fifty-four patients represent 28.1% of ICU admissions during the study period, while the fifteen deaths represented 5.9% of ICU deaths during the same period.

Discussion

While 45 patients (90.8%) in this study presented with pre-eclampsia/eclampsia, 44 patients (81.5%) had eclampsia. This is similar to several other studies which showed that pre-eclampsia/eclampsia was the predominant indication for admission to their ICUs (7-9). Some other studies have shown that obstetric hemorrhage was the predominant diagnosis for admission to the ICUs (10-14).

Though most studies were in agreement that pre-eclampsia/eclampsia and obstetric hemorrhage were the commonest obstetric diagnoses for admission to the ICUs (4,6,9,10,12), the percentage of eclamptics in this study was higher.

A report from Burkina Faso in West Africa also showed that eclampsia and septic shock were the two commonest admission diagnoses to the ICU (15).

The reason for this may be due to inadequate health care services leading to progression from pre-eclampsia to eclampsia or the fact that both hospitals are the only ones with good ICU facilities in their areas. The maternal mortality in this study was 28% with eclampsia contributing to 86.6% of the deaths.

This mortality rate is high compared to other studies from the western world and Asia. From the United States, Kilpatrick et al. (9) reported a maternal mortality of 25%, Collop and Sahn of 20% (1) and Jenkins et al. of 14% (7). Cheng et al. (2) reported a case fatality rate of 4.6% in their study in Singapore.

Dao et al. from Burkina Faso reported a maternal mortality of 60% in their study (15). Okafor et al. reported from Enugu, Southeast Nigeria, a maternal mortality rate of 33.3% (6). The figure from Enugu may be due to under utilization of ICU facilities for obstetric patients.

Eclampsia, the leading cause of fatalities in this study, is a recognized leading cause of maternal death in the developing world (16,17). It is also a major cause of maternal mortality in Nigeria (18,19), which has 37 000 or the world's second highest incidence of maternal deaths (20).

Abuja, the federal capital territory is geographically located in the north central part of Nigeria and has a population of about 403 000. Eclampsia is regarded as the leading cause of maternal deaths in northern Nigeria (18,21) unlike the south where obstetric hemorrhage and sepsis are the leading causes (19,22). A study in Gombe, Northern Nigeria had shown homocysteine and high density lipid levels to be low in the blood of pre-eclampsia/eclampsia patients (23).

A study has shown this to be the case despite access to obstetric services in the West African subregion (24). However, it is obvious from the review of other literature that mortality was higher in the sub-Saharan Africa mainly because of ignorance and poor health care delivery systems.

Another possible cause for the high mortality rates in the two Nigerian studies (from Enugu and Abuja) may have been due to the fact that magnesium sulphate was rarely used in patient management (two patients in this series and none in the Enugu study). The drug is known to halve the risk of eclampsia in patients with pre-eclampsia and reduced maternity mortality by 45% in a study (25). Diazepam was used to control fits in all the eclamptics except the two cases mentioned above.

Duley in a seminal paper argued against the use of diazepam in controlling eclamptic fits (26).

A reluctance in using invasive monitors (central venous pressure, direct arterial blood pressure monitoring) may have contributed to these high rates.

Apart from these the presence of cerebral oedema, although not clinically proven is likely to have contributed to the maternal mortality in this study.

Katz et al. in their study noted that seizures were the first signs of pre-eclampsia in the subjects in their study (27). They also noted that with the current standard of care in the United States, only 17% of eclampsia cases were preventable, with better critical care services having resulted in much lower mortality rates.

ICU admission was necessary for these patients (96% of parturient) because of the need for ventilatory support and maintenance of a patent airways, continuous monitoring of the cardio-respiratory systems and higher nursing care. A patient with eclampsia and acute renal failure received three sessions of haemodialysis in her successful management.

The need for good obstetric critical care services confirms the view of Mahran (16) that despite all preventive measures, diagnostic modalities and intensive treatment, eclampsia is still one of the leading causes of maternal mortality in the developing world.

Obstetric haemorrhage, another common ICU diagnosis in the obstetric population was low in this study. Massive bleeding, especially of the uterus could be rapidly fatal in environments with poor referral systems and inadequate road networks.

Thus, while efforts are being made to encourage antenatal booking of high risk patients, provision of resources for patient management is needed to help reduce the mortality associated with the critical obstetric patient. There is also a need for a separate ICU or high dependency unit (HDU) to take care of the obstetric population. Reportedly each HDU meets the needs of half the obstetric population requiring high acuity care (28). This should be situated near the labor ward so as prevent delay in patient transfer as there are patients in need of ICU management who can not get it.

A study in Holland advocated the study of the role of ethnicity in severe morbidity in pregnancy because of the high number of non-Caucasian women admitted to their ICU (29).

Critical care management of obstetric patients in Nigeria is fraught with the problems of poor health care delivery system, late presentation of patients and a paucity of ICUs. Eclampsia was the leading cause of maternal mortality in this study. Provision of more intensive care units and proper equipping of them in human and material resources is advocated.

Acknowledgement

We thank the entire staff of the intensive care unit and records department of National hospital, Abuja for their cooperation during this study.

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