

# Obstetric Intensive Care: A Developing Country Experience

B Osinaike, S Amanor-Boadu, A Sanusi

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## Abstract

**Objective:** This review was to determine the intensive care unit (ICU) utilization by critically ill obstetric patients, the spectrum of diseases, interventions required and the outcome.

**Methods:** A retrospective review was performed on obstetric patients admitted to the ICU of the University College Hospital, Ibadan during a five-year period (1998 to 2002).

**Results:** Seventy obstetric patients representing 1.4% of all deliveries were admitted to the ICU during the study period. Only 21.4% of the patients received antenatal care (ANC) while 66% were primipara and 60.5% were uneducated. Sixty percent of the patients had pregnancy-induced hypertension as their primary diagnosis while 55% and 31% had respiratory insufficiency and cardiovascular instability respectively as indications for ICU admission. Mortality was 52%. Factors related to poor outcome are need for mechanical ventilation ( $P=0.003$ ) and need for inotropic support ( $P=0.031$ ).

**Conclusions:** ICU utilization for obstetric conditions is on the increase. The need for ventilatory or inotropic support may predict poor outcome. Full adoption of safe motherhood initiative would reduce obstetric ICU admissions.

## INTRODUCTION

There is agreement in the developed world on the need for Intensive care facilities for the obstetric patient. This level of care may not be attainable for the pregnant in the developing world as lack of access to basic health facilities is one of the major factors responsible for high maternal mortality rates in the region. The Intensive care beds in Nigeria, with a population of over 120 million, are less than 100 and limited to the teaching hospitals situated in the urban centres and are grossly oversubscribed.

The ICU at the University College Hospital, Ibadan, Nigeria is a 7-bedded general ICU serving about 800 acute beds. Critically ill obstetric patients, who until 1997 were cared for on the Labour Ward, are increasingly being managed in the ICU.

This review seeks to determine the ICU utilization rate, identify common indications for admissions and to assess the outcome and risk factors associated with mortality.

## PATIENTS AND METHODS

Hospital ethical approval was obtained to carry out this

study. The case notes and ICU charts of all the obstetric patients admitted to the ICU from January 1998 to December 2002 were reviewed. Data obtained were classified into demographic data, obstetric data and ICU data. Statistical analysis was performed using SPSS version 10.0. Results are expressed as mean  $\pm$  SD and number of patients/percentage. Linear regression analysis was used to determine the prognostic factors. A p-value of less than 0.05 was considered significant.

## RESULTS

Seventy obstetric patients were admitted to the ICU from the 5008 deliveries during the period reviewed, representing 1.4% of all deliveries and 4.6 % of the total ICU admissions in the same period. All the patients were admitted postpartum.

The age range was 16 to 41 years with a mean of  $26.77 \pm 5.8$  yrs. Forty-six (66%) were primipara and 55 (78.6%) did not receive antenatal care (Table 1). Table 2 shows the frequency of obstetric ICU admission over the period of study. Sixty (85%) were delivered by caesarean section. In 59 (84%) patients obstetric complications led to the ICU admissions.

The remaining 11(16%) had medical conditions not related to pregnancy but which might have been aggravated by pregnancy (Table 3).

**Figure 1**

Table 1: Patient characteristics

Number of patients	70
Age (mean ± SD) yrs	26.68 ± 5.62
Social status	Educated-28 (39.5%) Uneducated-42 (60.5%)
Parity	Primigravid-46 (66%) Multigravid-24 (34%)
ANC attendance	Yes-15 (21.4%) No-55 (78.6%)

**Figure 2**

Table 2: Frequency of obstetric ICU admission

Year	Obstetric deliveries	ICU admission (%)
1998	864	1(0.2)
1999	918	5(0.8)
2000	1067	9(1.1)
2001	1125	18(1.8)
2002	1094	37(3.4)
Total	5068	70(1.4)

**Figure 3**

Table 3: Primary Patient diagnosis

Patient diagnosis	Admissions	% of admissions
Pregnancy induced hypertension(PIH)	42	60.0
Obstetric haemorrhage	12	17.1
Sepsis	6	8.6
Haematologic	5	7.1
Obstructed labour	5	7.1

The most common obstetric diagnosis was preeclampsia and its complications(60% of all obstetric ICU transfers). The reasons for obstetric ICU transfer were predominantly respiratory failure (55%), haemodynamic instability –hypo or hypertension (31%), and neurologic dysfunction –seizures and/or coma following eclampsia(14%)(Table 4).

**Figure 4**

Table 4: Indications for ICU admissions

Indications	Admissions	% of admissions
Respiratory insufficiency	38	54.3
CVS Instability	22	31.4
Neurologic dysfunction	10	14.3

The mean length of stay in the ICU was 2.6 ± 2.1 days with a range of 1 to10 days. While in the ICU interventions included oxygen therapy, blood transfusions, cerebral

decompressive therapy, antihypertensives and mechanical ventilation. Nineteen patients (27%) required mechanical ventilation, 10 of whom received ventilation only for a short period (<24 hr) post-operatively. Thirty-five maternal deaths occurred in the ICU (Table 5).

**Figure 5**

Table 5: Patient diagnosis related to outcome

Diagnosis	Survived Number (%)	Did not survive Number (%)
Pregnancy induced hypertension(PIH)	24(57)	18(43)
Obstetric haemorrhage	4(33)	8(66)
Sepsis	1(16.6)	5(83.4)
Haematologic	3(60)	2(40)
Obstructed labour	3(60)	2(40)

Analysis of the patient subgroups (Table 6) demonstrated that only the need for mechanical ventilation and/or inotropic support may predict poor outcome.

**Figure 6**

Table 6: Factors strongly related to poor outcome.

Factor	Adjusted Odds ratio (95%CI)	p-value
Ventilated	0.447(0.150-0.69)	0.003
Inotropic support	0.319(0.040-0.771)	0.031

**Figure 7**

Table 7: Comparison of data among reported series of critically ill obstetric patients.

	Graham <i>et al.</i> 1989	Kilpatrick <i>et al.</i> 1992	Lapinsky <i>et al.</i> 1997	Present study	General
ICU Type	General	Med-Surg.	Med-Surg.	Med-Surg.	General
Duration (yr)	5	5	5	5	5
Pts number	23	32	65	65	70
Admssn/1000 Deliveries	1	4	2.6	2.6	14
Mortality (%)	8.6	12	0	0	52
Mean LOS	4.1	5.4	2.9	2.9	2.6
Ventilated (%)	60	59	42	42	25

LOS – length of stay

**DISCUSSION**

Consonant with other studies,<sup>2,3</sup> pre-eclampsia and eclampsia are the major reasons for ICU admissions in our study. The higher percentage of pregnancy-induced hypertension (60%) is probably as a result of the UCH, Ibadan being a tertiary institution that receives all the complicated obstetric cases in the immediate environment. Pre-eclampsia is a major cause of morbidity and mortality worldwide but more so in the developing countries.<sup>4</sup> The disease is common in primipara patients who constitute 66% of the cases we reported.

Respiratory support is often required for the complications of pre-eclampsia such as pulmonary oedema, seizures, aspiration pneumonitis etc. However in a developing economy as ours, often times patients that require respiratory support do not get it either because of unavailability of ventilators or inability to afford the cost of ICU care. Obstetric haemorrhage was the second most common reason for admission to our ICU and this is consistent with many studies.<sup>5,6,7</sup> The bleeding was due to the usual causes (abnormal implantation of the placenta and uterine atony) but the challenges of management were reliant on clinical judgement and monitoring as there were instances of paucity of invasive monitoring equipment in some patient. Another problem was the scarcity of blood and blood products, which led to prolonged and complicated resuscitation efforts with resultant high mortality. To maintain the circulation while waiting for blood units we have acquired the non-pneumatic anti shock garment which has proven effective so far in its trial on the obstetric suite and the ICU. Improving safe blood supply is part of

on-going national activities directed at improving safe motherhood practices. Prolonged obstructed labour was the reason for ICU admission in five patients and it is a reflection of poor obstetric care. The patients usually arrived dehydrated, acidotic and septic resulting in the need for continued resuscitation in the ICU.

Infections are responsible for 15% of maternal morbidity and mortality worldwide.<sup>4</sup> However only 8% of our patients presented with sepsis. We had expected a higher number of cases when we considered that sepsis frequently accompanies many conditions in obstetrics. Similarly, were surprised that Okafor and Aniebue,<sup>8</sup> from our country did not report any sepsis, no reason was given for this in their paper.

The major point of our study is the high mortality rate of 50% which is as poor as the 60% reported by Dao et al,<sup>7</sup> poorer than the report from our area 33% and unacceptable when compared with 2.3% and 8.6% from other studies.<sup>9,10</sup>

Low socio-economic status and poor antenatal care have considerable effects on obstetric complications and outcome.<sup>11</sup> The fact that a large percentage of our patients were uneducated and did not receive antenatal care, one can say that these are contributory factors to the poor outcome reported in these review.

Comparison of our data with published series<sup>10,12,13</sup> of obstetric ICU admissions demonstrates considerable

differences (Table 7). This table shows that within the same period of five years we have more patients than in the other reviews despite the various limitations of funding an ICU in a developing economy like ours. This is because our centre is a tertiary centre and our beds serve a population of about 2 million in Ibadan making better preventive care at lower levels mandatory in our setting.

### CONCLUSION

Intensive care unit utilization for obstetric conditions are on the increase in our institution and hypertensive disorders of pregnancy with its associated complications still remains the most common reason for ICU admission. The conscientious and full adoption of safe motherhood initiative would prevent some of the complications requiring treatment in the ICU. Improvement in the number of ICU beds and the quality of care should also be advocated for.

### CORRESPONDENCE TO

Dr B.B. Osinaike, Dept. Of Anaesthesia, University College Hospital, Pmb 5116, Ibadan, Nigeria. (Drosinaike@Yahoo.Co.Uk). Contact Phone 234-33303675.

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Can J Anaesth 1997; 44(3): 325-329.

**Author Information**

**B.B. Osinaike, FMCA**

Senior Registrar, Department of Anaesthesia, University College Hospital

**S. D. Amanor-Boadu, FMCA,FWACS**

Consultant Anaesthetist, University College Hospital

**A. A. Sanusi, FMCA, FWACS**

Consultant Anaesthetist, University College Hospital