OBSTETRIC ADMISSIONS IN A GENERAL INTENSIVE CARE UNIT IN NORTH-CENTRAL NIGERIA

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ABSTRACT

Context: Maternal mortality remains unacceptably high in many developing countries and many pregnant women in these countries will require critical care during pregnancy and will be managed in general intensive care units.

Objective: To determine the indications for admission of obstetric patients into the general intensive care unit of Jos University Teaching Hospital over a 14 years period and the outcome of their management.

Study Design: The study is a retrospective descriptive study. All obstetric admissions into the intensive care unit of Jos University Teaching Hospital from January 1994 to December 2007 were reviewed.

Results: There were 231 obstetric admissions which was 17.29% of total ICU admissions and 2.05% of all deliveries in the hospital during the period of review. The mean age of the patients was 25±7.1 years. Pregnancy induced hypertension made up 80.52% of the admissions, while haemorrhage was 12.56% and non-obstetric admission was 6.93%. The most common non-obstetric admission was sepsis (43.70%). Of all admissions 90.91% were in the postpartum period and 9.09% during the antepartum period. The medium length of was two days. The mortality rate was 15.15% with significantly higher ratio of deaths in patients with non-obstetric indications for admission and in patients older than 35 years.

Conclusion: There is a high rate of ICU admission of obstetric patients in our hospital. This increases the burden of care in the ICU and contributes to poor outcome. Establishment of obstetric high dependency units will reduce the burden on general ICUs.

INTRODUCTON

Maternal mortality remains unacceptably high in developing countries. While maternal mortality ratio in developed countries is in the region of 4 to 20 per 100,000 live birthsin developing countries it could be as high as 890 per 100,000 live births[1]. Maternal mortality ratio in Nigeria which stands at about 550 per 100,000 live births[2] is among the highest globally, which is a reflection of the poor level of healthcare delivery within the country as is common with many developing countries. Quite a number of pregnant women would require critical care during the course of their pregnancy or delivery and management of these patients in our environment is often hampered by shortage of qualified manpower and facilities.

Literature from many parts of the world report haemorrhages and hypertensive disorders as the most common conditions admitted into the ICU

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amongthis group of patients[3,4]. In the Nigerian context there are a few literature reporting intensive care for pregnant women and most of these report ICU admission rates within the region of 1.5% and 7.27%[5,6,7,8]. This is much higher than what obtains in developed countries. The mortality rates in these studies are also much higher than what obtains from studies emanating from developed nations.

Our study is a retrospective review of obstetric admissions in a general intensive care unit of a tertiary health care facility in north-central Nigeriaover a 14 years period. We set out to determine the incidence, primary diagnosis, indications and outcomes in pregnant women requiring intensive care at the Jos University Teaching Hospital.

MATERIALS AND METHODS

Approval of the hospital ethics committee was sought for and obtained. All obstetric admissions into the intensive care unit of the Jos University Teaching Hospital from 1st January, 1994 to 31st December, 2007 were retrospectively reviewed.

The hospital is a 500 bed capacity hospital while the ICU is a multidisciplinary ICU with a 6 – bed capacity. It is managed by consultant anaesthetists, residents and doctors in the various specialties. It also has trained intensive care nurses. The ICU manages patients from the surgical and medical specialties.

Data were obtained from ICU records and patient case files. Information obtained were the patients age, diagnosis, indication for ICU admission, complications, interventions, outcomes and length of stay in the ICU. Patients with eclampsia were categorized as ante-partum, intra-partum or post-partum while obstetric haemorrhages were categorized as antepartum or postpartum. The status of pregnancy at admission (i.e. whether antepartum or postpartum)was noted. ICU utilization was defined as the number of ICU admissions of pregnant women and women in the puerperium during the period of study divided by the total number of deliveries in the hospital in the same period. Diagnosis at the time of ICU admission was categorized as obstetric (i.e. admissions resulting as a consequence of pregnancy and delivery e.g. pre-eclampsia, eclampsia and haemorrhage) or non-obstetric (i.e. admissions resulting from medical conditions e.g. heart diseases, infections, asthma).

Data were analyzed using the EPI info version 7 statistical package. The categorical data were presented as percentage while the continuous data were presented as mean and standard deviation. Students t-test was used to compare categorical data while the Mann – Whitney test was used to compare continuous data. Statistical significance was defined as a p value <0.05.

RESULTS

There were 245 obstetric admissions during the period of review, however records for 14 patients could not be traced so 231 patients were analyzed. This was 17.29% of the total ICU admissions during the period. This was also 2.05% of deliveries during the same period. The age of the patients ranged from 15 to 45 years with a mean of 25.5±7.1 years. The age range between 15 and 20 years had the highest frequency of admissions 85(36.80%). The median length of stay (LOS) was two days with a mean of 2.3±3.6 days and a range of some hours to 36 days. Majority of the patients (88.31%) had a LOS of between one and seven days Table 1.

Eclampsia and preeclampsia were the diagnosis with the highest admission rates making up 80.52% of admissions. Of the patients with eclampsia 105(61.76%) were antepartum, 44(25.88%) were intrapartum and 21(12.36%) were postpartum Table 2. Haemorrhage made up 12.56% of admissions while non-obstetric conditions made up 6.93% of

admissions. The most common non-obstetric diagnosis at admission was sepsis (43.70% of non-obstetric admissions and 3.03% of total admissions) followed by cardiac disease (18.80% of non-obstetric admissions and 1.30% of total admissions) Figure 1. Of all the admissions 210(90.91%) were in the postpartum period while 21(9.09%) were during the antepartum period. Eight (50%) of the admissions with non-obstetric diagnosis occurred in the antepartum period while only 13(6.05%) of the admissions with obstetric diagnosis occurred in the antepartum period.

The most common indication for admission was instability of the cardiovascular system in 40.45% of patients followed by respiratory insufficiency in 36.23% of patients. The least common indication was neurologic dysfunction Figure 2.

Thirty five of the patients died giving a mortality of 15.15%. Thirty one (88.57%) of the deaths were due to obstetric causes even though the non-obstetric patients were more likely to die $p<0.05$ Table 3. Twenty one (60.0%) of the deaths were among patients with eclampsia and four (11.43%) from pre-eclampsia meaning that 25(71.43%) deaths were in patients with eclampsia and pre-eclampsia. Patients in the age group > 35 years were more likely to die $p< 0.05$. Most of the deaths (65.71%) occurred within one to seven days of admission with another peak among those who stayed less than one day (28.57%).

DISCUSSION

Though most women do pass through pregnancy uneventfully, a significant population of pregnant women develop complications that would require ICU admission. In our study we found an ICU admission rate among pregnant women of 17.29% with an ICU utilization rate of 2.05%. Eclampsia and preeclampsia were the most common diagnosis at admission and cardiovascular instability the most common indication for admission.

ICU admission rates for obstetric patients have been found to differ between developed and developing nations. Studies have shown admissions to be lower in developed nations. While obstetric ICU admissions in developed countries are in the region of 0.1 – 0.9%, in developing countries it may be as high as 10%[9,10,11]. This is probably a reflection of the high frequency of complications that are associated with pregnancy in our setting. There is poor utilization of antenatal care and a large population of women go through pregnancy unsupervised. Many of these women first present to the hospital with complications.An obstetric ICU admission rate of 17.29% is quite high even in our region. Studies from other ICUs in Nigeria have reported obstetric admission rates of 1.5% to 7.27%[5,6,7,8]. Threshold for ICU admission differ between hospitals and our finding may be a reflection of a low threshold in our hospital. The absence of an obstetric high dependency unit (HDU) in our hospital could also be a contributory factor in the high ICU admission rate. On the other hand well equipped labour rooms and high quality of obstetric services obtained in developed countries may be a factor for low ICU admission rates.

Our patients were mostly young and slightly younger than those in studies from other ICUs in Nigeria[5,6,8]. Like in our study Wanderer et al[12] found the highest ICU admissions in the age group <20 years but unlike our study they discovered another peak in admissions in the age group >35 years. The study by Selo-Ojeme et al found peak admission within the age group 20-30 years and their patients were generally older than our patients[13]. The length of ICU stay in our patients was similar to those found in studies in Nigeria[6,8,14], Saudi Arabia[18], America[12] and Europe[13].The short length of stay in our study was probably because the patientswere usually very unstable and those who were able to pull through made remarkable recovery. This is generally the trend because obstetric patients

are usually young.

Like in our study, other studies from ICUs in Nigeria showed that the most common diagnosis at admission were pregnancy induced hypertension and obstetric haemorrhage[5,6,14]. The findings were similar in other parts of the world[3,15.16]. Eclampsia is a major cause of maternal morbidity and mortality in Nigeria with Northern Nigeria being worst hit[17]. Most of the patients (90.91%) were admittedinto the ICU in the postpartum period which was similar to findings byOkaforet al[14] in their study carried out here in Nigeria and by Gombar et al[19] in an Indian study. Our patients often present late to the hospital and delivery is usually undertaken before admission into the ICU. The types of eclampsia in our study were also similar to that reported by Okafor and Efetie[18].

In the present study the most common non obstetric diagnosis at admission was sepsis. This was similar to the discovery by Aldawood in a study in Saudi Arabia[16] while a study carried out in Maryland, USA and another Saudi Arabian study by Anwari et al had high proportion of cardiac disease[12,20].

Unlike in the study by Faponleet al[5] and Osinaike et al[6] we found the most common indication for admission into the ICU to be cardiovascular instability. The most common reason for admission into ICU was neurological dysfunction in the study by Faponle et al while respiratory failure was the predominant indication for ICU admission as found by Osinaike et al. Bhat et al in India discovered respiratory and cardiovascular problems were the main reasons for ICU admission[21].

The mortality rate of 15.15% in this study is above the documented reports from developed countries. Wanderer et al found a mortality rate of 1.8%. The study from India by Gombar et al reported a mortality rate of 31.1%. The median mortality for developing countries has been put at 14.0% which is comparable to our finding though reported mortalities may be as high as 40% in some developing countries[22]. High mortality rates in developing countries could be traced to a number of factors. Socioeconomic factors like inadequate means of transportation would mean that many of the patients present late with severe complications. A large number of the patients are also un-booked. There is also the dearth of requisite facilities and qualified intensive care personnel. At the time of this study our ICU had only one ventilator. The absence of a HDU in our hospital also means that ICUs are overburdened with a high competition for bed space.Selo-Ojeme et al alluded to the fact that HDUs do decrease ICU admission rates[13]. They went further to state that in such situations ICU admissions cannot be relied on to reflect the severity of conditions in obstetric patients in such institutions. Developed countries are now moving in the direction of dedicated ICUs for obstetric patients as it is believed that this further improves outcome in this group of patients[23,24]. Developing countries are yet to move in that direction[6].

In the study by Okafor and Efetie[18] on patients with eclampsia in a Nigerian ICU they recorded a mortality rate of 29% which was well above our experience. The mortality rate among our patients with eclampsia was 12.35%. The causes of death in these patients included intracranial haemorrhage, DIC, HELLP syndrome and pulmonary oedema.

We had a greater proportion of deaths among the non-obstetric causes of admission with sepsis being the biggest culprit as reported by other authors[16]. Most of the patients with sepsis came in with shock which could not be effectively managed because of inadequacy of invasive monitoring.

A limitation of our study is that scoring systems were not applied for most of our patients so we could not compare predicted outcomes in our patients with the observed outcome. While scoring systems have been widely used in ICUs in developed countries, their application is only beginning to gain momentum in developing countries like Nigeria. We were also not

able to determine socioeconomic factors related with ICU admission because being a retrospective study some of these information were not available.

We observed a high rate of ICU admission of obstetric patients in our hospital with eclampsia contributing an overwhelming majority. The high ICU admission rate may be as a result of absence of a HDU in our facility which is also common with most tertiary hospitals in our environment. Developing obstetric HDUs and better equipping our delivery rooms will reduce ICU admission rates. Inadequate access to antenatal care in our region would also mean that a large number of obstetric patients present to hospitals with complications which increases the need for intensive care in these patients. These will ultimately increase the burden on the ICUs and contribute to poor outcome. The region is also in dare need of improved intensive care facilities and personnel.

TABLE 1. Variables of obstetric patients showing age group and length of stay (LOS) in the ICU

VARIABLE	FREQUENCY (n = 231)
AGE GROUP IN YEARS [n (%)]	
15-20	85(36.80)
21-25	51(22.08)
26-30	44(19.05)
31-35	29(12.55)
36-45	22(9.52)
LOS IN DAYS [n (%)]	
<1	18(7.79)
1-7	204(88.31)
8-14	5(2.16)
>14	4(1.7)

TABLE 2 Diagnosis in patients admitted into the ICU during pregnancy or immediately after delivery

DIAGNOSIS	FREQUENCY	PERCENTAGE	CUMULATIVE PERCENTAGE
APH	19	8.23	8.23
PPH	10	4.33	12.56
Pre- eclampsia	16	6.93	19.49
Antepartum eclampsia	105	45.45	64.94
Intrapartum eclampsia	44	19.05	83.99
Post-partum eclampsia	21	9.08	93.07
Non-obstetric	16	6.93	100
TOTAL	231	100	

TABLE 3. Variables of obstetric patients admitted into the ICU indicating outcome mortality

VARIABLES	OUTCOME SURVIVORS (n = 196)	NON – SURVIVORS (n = 35)
DIAGNOSIS [n(%)]		
APH	17(8.7)	2(5.7)
PPH	7(3.6)	3(8.6)
Pre-eclampsia	12(6.1)	4(11.4)
Eclampsia	149(76.0)	21(60.0)
Non-obstetric	11(5.6)	5(14.3)*
AGE GROUPS IN YEARS [n(%)]		
15 – 20	79(40.3)	6(17.1)
21 – 25	42(21.4)	9(25.7)
26 – 30	36(18.4)	8(22.9)
31 – 35	25(12.8)	4(11.4)
36 – 45	14(7.1)	8(22.9)*
LOS IN DAYS [n(%)]		
< 1	8(4.1)	10(28.6)
1 – 7	181(92.3)	23(65.7)
= 8	7(3.6)	2(5.7)

Variables are expressed as frequency and percentage. *P value < 0.05. LOS = Length of stay, APH = Antepartum haemorrhage, PPH = Post -partum haemorrhage

FIGURES

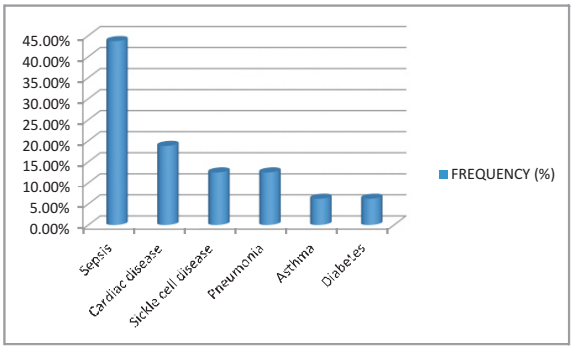

FIGURE 1. Non-obstetric diagnosis for ICU admission of obst etric patients

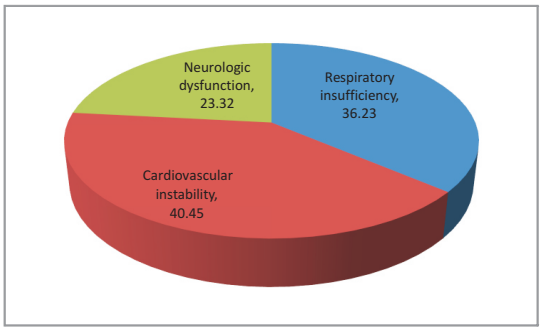

FIGURE 2: Indications for ICU admission

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