

# Serious Obstetrical Complications Admitted in an Intensive Care Unit in Benin

Aboubakar Moufalilou<sup>\*</sup>, Akodjenou Joseph, Tognifode Véronique Medesse, Dangbemey Patrice, Zounma Mawuwè Caleb, Tonato-Bagnan Angeline, Zoumenou Eugene

Faculty of Health Sciences, University of Abomey-Calavi, Cotonou, Benin

## Email address:

moufaliloua@yahoo.fr (A. Moufalilou)

<sup>\*</sup>Corresponding author

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**Abstract:** *Introduction:* Most complications in pregnancy, delivery or post natal period are managed by obstetricians. However, some are admitted to intensive care units (ICU), for resuscitation. The aim of this study was to describe the epidemiological and clinical profiles of patients admitted in the intensive care unit for serious obstetrical complications at the University Associated Hospital of Mother and Child (CHU-MEL). *Materials and Methods:* This was a descriptive cross-sectional study with prospective data collection from October 1 to from October 1 to December 31, 2019. Were included pregnant and women delivered and within 42 days of the postpartum period admitted to the intensive unit care and presenting one of the criteria of severe maternal morbidity as defined by the EPIMOMS study. The analysis of the data was done with the STATA software. *Results:* The proportion of admissions to the intensive care unit was 15.44%. The patients were young (mean age 27 years), educated (76.19%), primigravida (39.05%), primiparous (38.1%) and without any particular history (85.71%). Most of them were referred from the peripheral health centers. The main reasons were complications of hypertension during pregnancy (53.33%), bleeding complications (42.86%) and infectious complications (7.62%). The most used products were antibiotics (92.38%), analgesics (89.52%), uterotonics (82.66%), anticoagulants (75.24%), magnesium sulfate (51.43%). *Conclusion:* Serious obstetrical complications are frequent. Their management needs an ICU well equipped especially in reference hospital. It is important that the references respect the norms to avoid that the patients arrive in a critical state.

**Keywords:** Serious Obstetrical Complication, Intensive Unit Care, Benin

## 1. Introduction

Approximately 830 women die every day worldwide due to complications of pregnancy or childbirth [1]. Others complications, which existed before pregnancy, become more serious during pregnancy, especially if they are not managed as part of care [2].

Most of these complications are managed by obstetricians. However, others are admitted to intensive care units.

In China, in 2010, obstetric patients accounted for 0.65% of all ICU admissions and 0.13% of all deliveries [3]. In Nigeria, in 2016, there were 101 admissions of obstetric patients for 11,308 births over a two-year period [4]. In Benin, a cross-sectional study with retrospective data collection conducted in the

intensive care unit of the University Hospital of Parakou found a frequency of 2.75% of all admissions [5].

The most common reasons for admission to intensive care units found in various studies are complications of hypertension associated with pregnancy; obstetric haemorrhage and infections [4, 6, 7].

The objective of this work is to study the profile of women presenting a serious obstetrical complication (or severe maternal morbidity) admitted in the intensive care unit of the University Associated Hospital of Mother and Child (CHU-MEL) in Benin.

## 2. Materials and Methods

This is a descriptive cross-sectional study with prospective data collection from 1 October to 31 December 2019. The

study population consisted of all patients admitted to the obstetrical intensive care unit of CHU-MEL of Cotonou during the study period. Were included pregnant women and women who delivered and withing 42 days postpartum admitted to the intensive care unit of the CHU-MEL and presenting one of the criteria of severe maternal morbidity as defined by the EPIMOMS study. A non-probabilistic method was used. The recruitment was exhaustive. The dependent variables was the serious obstetrical complication. The independent variables were sociodemographic, clinical, and paraclinical. Data were collected by clinical examination of the patients and from medical records, operative reports, and emergency registers using a survey sheet prepared with the kobo collect v1.23.3k tool.

The data analysis was done with the STATA software.

## 3. Results

### 3.1. Prevalence

During the study period 680 patients were admitted to the intensive care unit.

Among them, 105 admissions has been recorded for serious obstetrical complications, i.e. 15.44% of all admissions to the intensive care unit.

### 3.2. Socio-demographic Characteristics

#### 3.2.1. Age

The average age was  $27.105 \pm 7.127$ . The youngest was 14 years and the oldest 43 years. The median age was 27 years. The majority of the women were under 25 years of age (81.9%).

**Table 1.** Distribution of patients by age group.

	Number	percentage	%
≤ 24 years	40		38.1
25-34 years	46		43.8
≥ 35 years	19		18.1
Total	105		100

#### 3.2.2. Educational Level

Most of the patients were educated (76.19%) and those with at least secondary school level represented 47.62% of all admissions.

### 3.3. Mode of Admission

Most patients were referred (80.95%). The time between referral and admission to CHU-MEL was more than 60 minutes in 78.82% of cases. The shortest delay was 17 minutes and the longest was 2880 minutes (2 days). The median delay was 125 minutes.

### 3.4. Medical Past History

Among the patients, 14.29% had a medical history, namely sickle cell disease (6.68%) and hypertension (4.76%).

Primigravida and paucigravida represented 67.62% of all women admitted, nulliparous, primiparous and pauciparous represented 79.05% of patients.

### 3.5. Gravido-Puerperal Status on Admission

Complications occurred mostly in women outside of pregnancy (89.52%) either during post natal period (67.19%) or post abortum (13.33%)

### 3.6. Age of Pregnancy

For the pregnant women, the majority (52.81%) were not at term. The average age of the pregnancy was 34.24 weeks  $\pm$  5.41 weeks.

More than half of the patients had attended at least four prenatal consultations.

### 3.7. Clinical and Paraclinical Characteristics

#### 3.7.1. Clinical Signs on Admission

The most frequent signs were haemodynamic (paleness for 63.81%, or hypertension 55.24%) followed by respiratory distress.

**Table 2.** Distribution of patients according to clinical signs on admission.

	Number	percentage	%
Respiratory Distress	22		20.95
shock	10		9.52
Paleness	67		63.81
Haemorrhage	11		10.48
Hypertension	58		55.24
Convulsions	14		13.33
Coma with Glasgow score $\leq$ 8	6		5.71
Hyperthermia	15		14.29
Hypothermia	5		4.76
Jaundice	8		7.62
Protéinurie $\geq$ 3+	41		39.05

#### 3.7.2. Biological Abnormalities Found

The disorders were predominantly on the blood count (CBC). These were hyperleukytosis (58.1%), severe anaemia (33.33%) and thrombocytopenia (24.76%).

**Table 3.** Distribution of patients according to biological abnormalities.

	Effectif	%
Thrombopénia	26	24.76
Aspartate Amino Transférase elevated	18	17.14
Alanine Amino Transférase elevated	9	8.57
Serum creatinine elevated	11	10.48
Severe Anemia	35	33.33
Hyperleucocytosis	61	58.1
Hyponatremia	2	1.9
Hypernatrémie	3	2.86
Hypokaliémie	2	1.9
Hyperkaliémie	8	7.62
Total Bilirubinemia elevated	2	1.9
Indirect Bilirubinemia elevated	2	1.9

### 3.8. Diagnosis on Admission

Complications of hypertension in pregnancy were found in 53.33% of the patients, haemorrhagic complications in 42.86% and infectious complications in 7.62% of the women.

**Table 4.** Distribution of patients according to diagnosis on admission to the intensive care unit.

	Number	percentage %
hypertensive complications 53,33		
Eclampsia	29	27.62
Severe Pre-éclampsia	26	24.76
HELLP Syndrome	1	0.95
bleeding complications 48,57		
post-partum haemorrhage	16	15.24
Abruptio placenta	12	11.43
Prævia placenta	10	9.52
Ectopic pregnancy	9	8.57
Uterine Rupture	1	0.95
post-abortion Haemorrhage	3	2.86
infectious complications 7,61		
post-abortion Pelvipéritonitis	2	1.9
Sepsis	1	0.95
Severe Malaria	5	4.76
Other complications 14,93		
Vaso-Occlusive crisis	2	1.9
Severe Anemia	4	3.82
Respiratory Distress	5	4.76
Peripartum Cardiomyopathy	1	0.95
Coma	1	0.95
Severe Thrombopénia	1	0.95
Acute pulmonary oedema	1	0.95
Acute asthma	1	0.95

### 3.9. Retained Signs of Severity

Some patients had several severity criteria as showed in Table 5.

**Table 5.** Distribution of patients according to the severity criteria selected.

	Number	%
Acute severe anemia < 7 g/dL	35	33.33
Convulsion	29	27.62
post-partum haemorrhage $\geq$ 1500 mL	16	15.24
shock	13	12.38
Creatininemia > 15 mg/L	10	9.52
Acute hypoxemia with SpO <sub>2</sub> $\leq$ 90%	8	7.62
acute pulmonary oedema	7	6.67
Coma	6	5.71
Blood Transfusion $\geq$ 4 packs of red blood cells	4	3.81
Thrombopenia <50000/ mm <sup>3</sup>	3	2.86
Hystérectomy peripartum	2	1.9
Direct Bilirubinemia > 7 mg/L	2	1.9
Acute psychiatric disorders	1	0.95
Troponinemia > 1 µg/L	1	0.95

## 4. Discussion

### 4.1. Prevalence

In this study, the prevalence of serious obstetric complications admitted to the intensive care unit was 15.44%. It is comparable to that found by Traore and al. in Mali in 2012, i.e. 16.11%. Tchaou and al. in 2013 at the regional university associated hospital of Borgou found a prevalence of 2.75% [5]. However, that study was conducted in a multipurpose intensive care unit receiving patients from specialties other than gynaecology and obstetrics.

In addition, during the study, a rate of 83.46 complications

per 1000 live births has been recorded. This rate is similar to that of Gebrehiwot and al. in Ethiopia in 2014 (85.14 per 1000 live births) and close to that obtained by Kiruja et al in Somalia in 2017 (101.84 per 1000 live births) [8, 9]. However, this rate is higher than those obtained by Ali and al. in 2011 in Sudan (26.45 per 1000 live births) and Bashour and al in 2015 in Egypt [10, 11].

This difference could be explained by the inclusion criteria used. Indeed, for patients admitted in the postpartum period, Bashour and al included women who did not make more than 7 days while the current study went up to 42 days after delivery. As for Ali and al, they used the inclusion criteria of Filippi 2005 which have fewer inclusion criteria [12].

### 4.2. Socio-demographic Characteristics

The pregnant women in this series were young with a mean age of 27.11 $\pm$ 7.13 and were mostly educated. This average is similar to that obtained by Bashour and al (27.8 years) and Gebrehiwot and al. (27.4 years) [8, 11]. This age corresponds to the period of maximum fertility as described by many authors around the world [13-15]. Tchaou and al in Parakou in 2013 found a lower average age (24.7 years) [5].

### 4.3. Mode of Admission and Medical Transport of Patients

In the current study, 80.95% of patients admitted to the intensive care unit were referred from peripheral health centers. This very high referral rate is explained by the status of the referral hospital of CHU-MEL. As such, it receives patients with serious pathologies from all health facilities. This situation is observed in most developing countries [16]. According to Supratiko, these referred women are at greater risk than those who came on their own to hospital [17].

This frequency is close to those of Litorp and al in 2014 in Tanzania and Liyew and al in Ethiopia in 2016 who found a rate of 87% and 88.2% respectively [18, 19].

The transport of patients to referral hospital is very poorly medicalised in this study. Indeed, only 12.94% of referred patients benefited from medical evacuation compared to 76.1% found by Liyew and al [18]. Medicalisation remains a major problem due to the lack of human and material resources: absence of ambulance or ambulance without any resuscitation equipment, absence of human resources to accompany the patients. Thus it is not uncommon for patients in vital distress or with a serious pathology (uterine rupture, eclampsia, etc.) to be referred on a motorbike taxi, sometimes without a venous catheter, without a referral form or with an incomplete referral form.

### 4.4. Clinical Characteristics of the Patients

The diagnoses on admission were dominated by hypertensive complications (53.3%) and bleeding complications (48.57%). Infectious complications accounted for only about 7.2%. Kiruja and al, Liyew and al also found the same pathologies in the same order with respectively 55% and 53% for hypertensive complications and 36.7% and 38% for bleeding complications [9, 18]. For Tchaou and al, infectious

complications were the most common (79.70%) followed by hypertensive complications (13.10%) and haemorrhagic complications (7.2%) [5].

#### 4.5. Past History

The majority of patients were primigravida or paucigravida (67.62%) and primiparous or pauciparous (79.05%). This result is close to those found in the literature [7, 5, 20, 21].

#### 4.6. Period of Admission

Most of the patients were admitted during postnatal period (76.19%). Tchaou and al (56.5%), also made the same observation [5]. This reflects the lack or inadequacy of screening of warning signs by health workers during pregnancy and their ignorance by pregnant women. This can also be explained by the fact that resuscitation anaesthetists admit and manage patients all the more easily when they are no longer carrying the product of conception. Obstetricians then tend to deliver the patients, especially once the fetus has reached pulmonary maturity before handing over.

#### 4.7. Comorbidities Before Pregnancy

The comorbidities most frequently encountered in this study were sickle cell disease (6.67%) and chronic arterial hypertension (4.76%). In Parakou, Tchaou and al found in 2012, in order of frequency, HIV infection (8.7%) and sickle cell disease (2.9%) [5].

#### 4.8. Pregnancy Follow-up

Of these women admitted to ICU, 84.76% had had at least one prenatal consultation. Litorp and al. and Etoundi and al. also found that the majority of women had attended at least one antenatal consultation (respectively 88% and 51.4%) [19, 22]. On the other hand, Tchaou et al. found 72.4% [10] of patients who had never attended an antenatal consultation. This could be linked to the better schooling rate of women and better geographical accessibility to health facilities in the southern region compared to the northern region.

Antenatal care coverage varies according to certain socio-demographic characteristics, including the level of education and the household's standard of living. Educated women are more aware of the importance of prenatal consultations [23].

#### 4.9. Clinical Signs and Biological Abnormalities in the ICU

The main danger signs found were respiratory distress, circulatory distress and neurological distress. Tchaou and al. in 2013 found quite the same clinical picture in their patients.

Biologically, the most frequent sign of severity was severe anaemia with a haemoglobin level below 7 g/dL (33.33% of patients). Tchaou and al. made the same finding but in a lower proportion (8.1%) [5] This relatively low proportion could be explained by the study population chosen. Indeed, Tchaou and al. included in their study all women admitted to intensive care.

## 5. Limitations

We conducted a study limited in an ICU of an hospital. The study has some limitations, notably:

1. The duration of the data collection. Indeed, it lasted three (3) months and two (2) weeks. This is a relatively short period.
2. The patients did not always have the means to pay for the check-up and all the prescribed medication.

## 6. Conclusion

Serious obstetrical complications are frequent and represent 15.44% of all admissions to the intensive care unit. Their management needs an ICU well equipped especially in reference hospital. Further more it is important that the references respect the norms to avoid that the patients arrive in a critical state.

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