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Maternal and Fetal Prognosis in Case of Emergency Cesarean Section at Cnhu-Hkm in Cotonou from 2021 to 2023

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Abstract

Introduction: Cesarean section is an artificial delivery procedure that allows fetal extraction after surgical opening of the uterus. Emergency cesarean sections are performed during pregnancy or delivery within a short timeframe for maternal and/or fetal rescue. The objective of this study was to examine the practice of emergency cesarean sections at the National University Hospital-Hubert Koutoukou Maga (CNHU-HKM) in Cotonou from 2021 to 2023. **Materials and Methods**: This is a retrospective, descriptive study over a three-year period from January 1, 2021 to December 31, 2023, including women who underwent emergency cesarean sections at the CNHU-HKM during this period and the newborns resulting from these cesarean sections. We worked on 1400 cases meeting these selection criteria. **Results**: Emergency cesarean sections accounted for 23.59% of deliveries. The mean time from decision to cesarean section was 114 minutes. The indications and mean times to cesarean section ranged from 158 minutes for placenta previa, 144 minutes for severe hypertension, and 138 minutes for eclampsia to 95 minutes for acute fetal distress, 58 minutes for pre-rupture syndrome, 49 minutes for acute pulmonary edema, and 22 minutes for prolapsed cord. The longer the time, the higher the maternal morbidity and mortality and neonatal mortality. Maternal mortality was 1.36%, with a decreasing trend over the years. Neonatal mortality was 11.53%. **Conclusion**: Emergency cesarean sections represent a significant proportion of all deliveries at CUGO due to its status as a referral center. The waiting time for emergency cesarean sections

remains long for some indications. Reducing this waiting time is important to improve maternal and fetal outcomes. It is essential to establish good collaboration between the different stakeholders, obstetricians, anesthetists and midwives.

Keywords

Cesarean Section, Emergency, Prognosis, Cotonou, Benin

1. Introduction

Caesarean section is an artificial delivery technique that allows fetal extraction after surgical opening of the uterus. The classification of emergency cesarean section has been validated by anesthesiologists and obstetricians, and they consider it urgent when the life prognosis of the mother and/or fetus is immediately or almost immediately compromised [1]. In sub-Saharan Africa, maternal and cesarean mortality rates are among the highest in the world. Maternal mortality has been estimated at 534 women per 100,000 live births [2]. A cross-sectional study in 12 hospitals in Benin in 2016 revealed that 80.7% of caesareans were performed as emergencies, with 48.0% for absolute maternal indications and 84.2% under spinal anesthesia. Early maternal complications of emergency caesarean section are considerable, particularly with regard to infections and hemorrhages. The maternal-fetal prognosis also raises questions not only with regard to the care itself but also its timeframe [3]. Faced with these statistics, we initiated this study whose objective was to analyze the practice of emergency caesarean section at the National University Hospital-Hubert Koutoukou Maga in Cotonou from 2021 to 2023.

2. Study Method

This descriptive retrospective study was conducted at the University Clinic of Gynecology and Obstetrics (CUGO) of the CNHU-HKM in Cotonou, over a three-year period, from January 1, 2021, to December 31, 2023. It focused on women who underwent an emergency cesarean section during this period. Cases of scheduled cesarean sections, newborns not resulting from these procedures, and incomplete records were excluded. Of the 1647 files meeting the inclusion criteria, only 1400 were usable, which constituted our sample. The dependent variable was maternal-fetal prognosis, assessed by the postpartum clinical condition of the mother and the Apgar score for the fetus. The independent variables included socio-demographic, clinical, and paraclinical data. Data collection was based on medical records, and statistical analysis was performed using SPSS version 21. The study was conducted with the required authorizations and in compliance with ethical and confidentiality standards.

3. Results

During the study period, 6980 deliveries took place at CUGO. Of these, 3434 were

by cesarean section, including 1647 emergency deliveries. Emergency cesarean sections, therefore represented 23.59% of all deliveries performed at CUGO and 47.96% of cesarean sections during the same period. But only 1400 files were usable, which constituted our sample

3.1. Sociodemographic Data

The average age of patients was 27.64 years, with a range from 14 to 47 years. The most common age group was 20 to 34 years.

The majority of our respondents resided in the municipalities of Abomey-Calavi (43.50%) and Cotonou (26.57%). Those with at least a secondary education represented 42.89%, and most were married (69.64%).

3.2. Medical History and Clinical Data

Paucigest and nulliparous women were the most represented with respective proportions of 35.50% and 38.07%. Hypertension and caesarean section were the most common medical history. Regarding pregnancy monitoring, it was good in 45.86% with at least 04 prenatal consultation and more than 4/5 (80.36%) had carried out a minimum prenatal labtest. Midwives were the agents who monitored the pregnancy in most cases.

The majority of pregnant women were referred (80.43%), without medical transport (56.57%). The reasons for referral were dominated by hypertension associated to pregnancy (39.47%), fetal distress (15.17%), and third-trimester hemorrhage (12.77%). On admission, the general condition was good in 72.36% of cases. Pregnancies were singleton (92.36%), preterm (52.35%), cephalic presentation (90.58%), in a clinically normal pelvis (79.21%).

3.3. Caesarean Section

The indication for cesarean section was made by a resident in 86.79% of cases before being confirmed or denied by the senior physician. The main indications found were third-trimester hemorrhage (36.09%), acute fetal distress (35.49%), and severe preeclampsia (21.84%). Regional anesthesia was performed in 70.50% of cases.

The average time to completion was 114 minutes. Average times per indication ranged from 22 minutes (prolapsed umbilical cord) to 158 minutes (placenta previa), as shown in Table 1.

Table 1. Distribution of indications for emergency cesarean section according to average time to treatment at the CNHU CUGO 2021-2023.

Indications	Average delay (in minutes)
Placenta previa	158
Severe Hypertension	144
Eclampsia	138

Continued

Dystocia	137
Prééclampsia	129
Abruptio placentae	126
Fœtal distress	95
Pre-rupture Syndrome	58
Acute Pulmonary edema	49
Uterine Rupture	25
Prolaps cord	22

3.4. Neonatal Prognosis

Of the 1507 newborns, 316, or 20.97%, underwent neonatal resuscitation. The APGAR score was superior to 8 in most cases. Neonatal mortality was estimated at 11.35%.

The longer the ceasean section delivery time, the higher the neonatal morbidity and mortality (Figure 1 and Table 2).

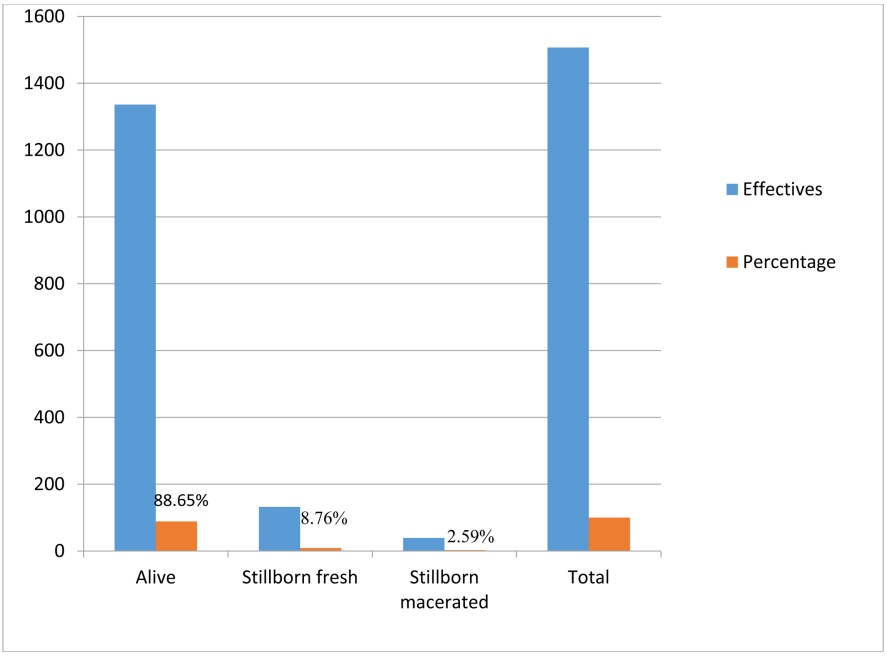

Figure 1. Distribution of newborns according to their condition at birth.

Table 2. Distribution of neonatal deaths according to Ceasarean section delivery.

C/section delivery time	Number of neonatal deaths	Neonatal mortality
Less than 1 h	33	9.16%
1 - 2 h	29	7.77%

Continued

2 - 3 h	36	16.80%
3 - 4 h	38	17.59%
More than 4 h	25	18.71%

3.5. Maternal Prognosis

The longer the Ceasean section delivery time, the higher the maternal morbidity and mortality (Table 3).

Table 3. Distribution of post-operative complications according to Ceasean section delivery time.

Complications	<1 h	Entre 1 - 2 h	Entre 2 - 3 h	Total
Anemia	41	38	28	107
Hemorrhage	21	23	11	55
Endometritis	4	7	2	13
Suppuration	0	4	5	09
Thread release	1	2	1	04
Pelvic inflammatory disease	0	1	2	03
Death	3	2	4	09
Total	70	77	53	200
Morbidity-mortality	38.33%	42.36%	50.00%	48.14%

4. Discussion

In our study, emergency cesarean sections accounted for 23.59% of all deliveries at CUGO. This rate is comparable to that of Anihouvi in 2019 in the same department (23.18%) [4], and that of Fouelifack and al. (23.37%) in 2016 in Yaoundé [5]. Emergency caesareans alone therefore represented quite two times the caesarean rate (10% to 15%) recommended by the WHO in 2015 [6]. However, this is the rate at the population level and not at the hospital level as it is the case in our study.

4.1. Sociodemographic Data

The average age of patients was 27.64 years, with a range from 14 to 47 years. The most represented age group was 20 to 34 years. This age group represents the peak fertility rate. These results are comparable to those of Anihouvi *et al.* (28 years) in 2019 in the same department [4]. The majority of subjects in our study resided in Abomey-Calavi (43.05%). Maikolyang, however, reported in 2015 that more than half of the patients at the CUGO came from Cotonou (68%) [7]. This reflects the dormitory town character of the municipality of Abomey-Calavi. Furthermore,

many patients were referred from the Abomey-Calavi University Hospital to CUGO.

The majority of patients in our study were married (69.64%). This rate is significantly higher than that of Anihouvi [4] and al. in 2019 (35.33%) and that of Essiben and al. in Yaoundé in Cameroon which reported 34.1% of brides [8].

Paucigestes (35.5%) and nulliparous women (38.07%) were the most represented in our study. Other African authors, including Fouelifack and al. reported a high rate of nulliparous women (35.9%) [5]. Furthermore, 17.95% of the subjects surveyed had a history of cesarean section. This proportion is lower than that of Anihouvi and al. in whom they represented 30.67% [4]. Nearly half of the patients in our series (45.86%) had good pregnancy monitoring with at least 4 prenatal consultation. As for prenatal assessment, 80.36% had a minimum of prenatal assessment while 14.43% of them had no assessment. This raises the problem of financial accessibility to obstetric care in Africa in general.

4.2. Indications and Time Frames for Emergency Cesarean Section

Hypertension associated to pregnancy appeared to be the leading cause of emergency cesarean sections at CUGO, accounting for 36.09% of indications. This was followed by acute fetal distress (35.49%) and third-trimester hemorrhage (17.24%). According to the World Health Organization (WHO), 16% of maternal deaths in sub-Saharan Africa are due to hypertensive disorders during pregnancy, with preeclampsia (PE) and eclampsia being the leading causes [9]. Several factors have been implicated, including advanced age of pregnant women, multiple pregnancies, nulliparity, a personal history of PE, and a history of chronic hypertension, type 2 diabetes, or renal failure [10]-[13]. Also, studies suggest that modifiable factors such as obesity, hypertriglyceridemia, smoking and diabetes may be added [14]-[16].

The average decision-to-incision time in our study was 114 minutes, beyond the 93 minutes reported by Anihouvi in 2019 and below the 124 minutes reported by Mongbo and al. in 2012 [17]. The increase in this time compared to Anihouvi's study in 2019 could be explained by the increasing number of admissions to CUGO, an increase not compensated by a strengthening of staff and infrastructure, particularly operating rooms [4]. This time is important because it has a medico-legal value. Experts and judges often use it to assess the efficiency of a team, recommendations from foreign learned societies, by examining the time between the decision to perform a cesarean section and the birth of the child [18]. This is why it is recommended in the United States and Great Britain that this time limit should not exceed 30 minutes and 20 minutes in Germany [19] [20]. It is clear that the operating conditions of obstetric services in Africa are far from allowing their staff to achieve such performance.

4.3. Prognosis

The longer the delay in treatment, the higher the maternal and fetal morbidity and mortality. Thus, it increased from 38.33% for delays < 1 hour to 66.84% for

delays > 4 hours for maternal morbidity and mortality. Mbongo JA and al., after a study at the Brazzaville University Hospital in 2016, stated that the delay between the indication and the performance of cesarean section is a factor that worsens maternal prognosis [17]. However, Anihouvi and al., in 2019, did not find a correlation between the delay in treatment and maternal and fetal prognosis [4]. Fouelifack and al., concurred regarding maternal prognosis, but regarding fetal prognosis,

They found that perinatal complications increased significantly when the time to treatment was greater than 120 minutes [5].

The maternal mortality rate among parturients in our series was 1.35%, significantly lower than the 5.33% reported by Anihouvi in 2019 [4], with a continuing downward trend over the three years of our study. Indeed, it was 2.42% in 2021, 1.25% in 2022, and 0.73% in 2023. This could be explained by measures such as subsidizing caesarean sections, better availability of labile blood products… demonstrating the ongoing efforts at all levels to reduce maternal mortality. Other studies conducted in sub-Saharan African countries have found similar rates: this is the case in Cameroon (3.3%) according to the report by Batoum and al. in 2022 [21]. Of the 1507 newborns resulting from emergency caesareans, 171 deaths were recorded, representing a perinatal mortality of 11.34%, below the 14.94% of the Ahinouvi study in 2019. Batoum and al in 2022 in Yaoundé reported a perinatal mortality of 15% [21]. But in the countryside (Maroua in Cameroon), Mboua Batoum found a much higher perinatal mortality of 21.6% with a strong correlation between the time to intervention and the fetal prognosis [21].

5. Conclusion

Emergency cesarean sections represent a significant proportion of all deliveries at CUGO due to its status as a referral center. The waiting time for emergency cesarean sections remains long for certain indications. Reducing this waiting time is important to improve maternal-fetal outcomes. It is essential to establish good collaboration between the different stakeholders, obstetricians, anesthetists and midwives.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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