

Caesarean Section of Quality at the Teaching Hospital of Brazzaville

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Abstract

In times of economic recession, with health policies restriction, the authors reviewed the cesarean section of quality by looking for the factors hindering its realization.

The study included pregnant women with a term of 28 weeks' gestation and above who underwent a caesarean section at the Teaching Hospital of Brazzaville. Those who delivered by a caesarean section in another health facility, then referred later to the Teaching Hospital of Brazzaville for management of maternal and / or fetal complication, and those who underwent laparotomies for uterine rupture were excluded.

The frequency of caesarean sections was 15.24%. The mean age: 27.6 ± 6.8 years; extreme 14 and 45 years. The cost of caesarean section was $121,848 \pm 23,451$ XAF with extremes of 106,000 to 312,500 XAF (1 euro = 600 XAF). This shows that the caesarean section cannot be affordable for the patient and for the health system. No caesarean section met the quality criteria. Poor quality factors of caesarean section were: antenatal care by a midwife, referred patients, maternal condition classified as ASA II and ASA III, caesarean section indicated for pre-rupture, lengthening of the decision-to-delivery interval (DDI)

time greater than or equal to 7 hours 5 minutes and caesarean sections performed under general anesthesia.

Keywords: quality caesarean section, Brazzaville

Conclusion

Quality criteria for cesarean section are not met for many parameters. In the current state of the situation, the practice of cesarean section of quality is not yet a reality at the Teaching Hospital of Brazzaville.

The caesarean section of quality benefits all patients who really need it, with minimal risk in outcomes for both the mother and the child, and is affordable for the patient and the health system [1]. It is therefore a caesarean section at the end of which there is no maternal and fetal mortality nor morbidity. It represents a necessary indicator for assessing the quality of care and Obstetrics' departments [2]. In 2013, 289,000 women died worldwide as a result of complications during pregnancy, during delivery or after. Today, almost all maternal deaths (99%) occur in developing countries, of which 62% in sub-Saharan Africa (179,000). Two countries, India (50,000) and Nigeria (40,000), together account for nearly one third of maternal deaths [3].

It is difficult for a large number of women in sub-Saharan Africa to have rapid access to caesarean section due to the high cost of the procedure and the long duration of transportation to the hospital [3].

In Congo, with public health measure of caesarean section free of charge for every patient, maternal and infant mortality declined slightly (425 deaths per 100,000 live births, 68 per 1,000 in the infant mortality rate, while the poverty rate remains high 46.5%) [4].

Due to difficulties in applying free caesarean section measures, there has been a switch from the existence of free entire drugs needed during the caesarean section to an emergency package where most of time inputs (drugs) are insufficient for the performing of the caesarean section, and currently free caesarean section measure is simply limited to non-taxation of the operative procedure.

The access to the health service is around 68%; the use of global health services is only 23.8% and financial problems (high cost of fees, lack of drugs) have a negative impact on the health of the population [5], as health insurance is not available nationally.

It is in this context of restriction in the health policy that we approached the problematic of the caesarean section of quality, in order to appreciate outcomes of the mother-child couple.

Patients and Methods

It was a retrospective, descriptive and analytical study based on patients' records who delivered by a caesarean section.

It was carried out during 6 months, from September 1st, 2016 to February 28th, 2017 at the Maternity, Obstetrics and Gynecology emergencies units of the Teaching Hospital of Brazzaville.

Pregnant women by 28 weeks' gestation who underwent a caesarean section were included.

Pregnant women who delivered by caesarean section in another health care facility, then later referred to the teaching hospital for management of a maternal and / or fetal complications, and laparotomies for uterine rupture were excluded.

The study variables were divided into several categories: those related to pregnancy (age, gestation, parity), to antenatal cares (number of antenatal visits and staff qualification), the mode of admission, the mean time from decision to delivery expressed in minutes. The total decision-to-delivery interval, considered as the mean time from the referral to delivery was calculated as a continuum of the following three intervals:

- Interval I: from referral to arrival (RA);
- Interval II: from arrival to decision of performing the caesarean section (AD);
- Interval III: from decision to delivery of baby (DD).

For the maternal condition at the decision to perform a caesarean section, we used the American Society of Anesthesiologists (ASA) physical status classification.

The fetal condition at the decision of caesarean section was assessed by the auscultation of the fetal heart using the Pinard' stethoscope.

Indications for caesarean section were divided into four groups: Mandatory caesarean sections, cautious caesarean sections, caesarean sections of necessity or catch-up, and incorrect caesarean sections.

The type of anesthesia (general or regional) was based on the indication of caesarean section and the technicality of the anesthetic nurse.

The maternal condition pre and post-operative, the length of stay (length of admission stay expressed in days); the fetal condition in early postoperative period were assessed. The mean direct cost of caesarean section expressed in XAF currency (1 euro = 600 XAF) and which included transport, operative procedure cost and anesthesia inputs, costs of admission and postoperative care.

Statistical Analysis

The analysis of the results was done using Epi data 3.2 and Epi info software. A descriptive study of studied variables was carried out. Quantitative variables were expressed as mean with their standard deviation, and qualitative variables as percentage. The study of risk factors for non-standard caesarean section was based on the Student's t test for quantitative variables and the Yates chi-square test for qualitative variables.

Logistic regression analysis using the Logistic method allowed us to set non-quality caesarean sections models. In all cases, *p*-values less than 0.05 were regarded as being statistically significant.

Results

Of the 1634 deliveries, 1385 were performed vaginally and 249 by caesarean section. The frequency of caesarean sections was 15.24%. The mean age of parturient was 27.6 ± 6.8 years (range, 14 to 45 years) with mean parity of 2.3 ± 1.5 (extremes 1 and 7). In total, 86.4% of pregnant women had at least three antenatal visits. Patients were self-referred in 52.2% of cases, while the others were referred by health care facilities.

Regarding indications, the first was cautious caesarean sections, followed by mandatory ones (Table I). Table II reports that postoperative infection (endometritis and parietal suppuration) was the most common maternal complication.

Concerning the newborns, 157 were healthy (63.1%). The early neonatal morbidity was considerable: 26.1%, needed to be admitted to neonatology unit for management. We recorded 27 cases of neonatal deaths, of which 17 (63%) were noted at the time of decision to perform the caesarean section and 10 (37%) between the decision and the delivery.

The mean length of stay in maternity unit was 7.5 ± 3.9 days (range 3 to 47), with a median stay of 6 days. The cost of caesarean section was $121,848 \pm 23,451$ XAF with extremes of 106,000 to 312,500 XAF. In 57% of cases, no maternal and fetal morbidity and mortality was noted.

The analysis of Tables III and IV shows that factors of caesarean section of poor quality were antenatal care performed by midwives, referred patients, maternal condition ASA II and ASA III, caesarean section for pre-rupture, the lengthening of the decision-to-delivery period of caesarean section greater than or equal to 7 hours 5 minutes, and caesarean section performed under general anesthesia. Ultimately, the estimate of non-quality Caesarean section (NQCS) met the following logistical regression equation:

$$\text{NQCS}^* = -2,16 + 0,75_ \text{ASAII} + 2,68_ \text{ASAIII} + 0,001_ \text{DD} + 0,79_ \text{General Anesthesia} + 1,13_ \text{Referred}$$

Discussion

Despite the fact that the guaranteed minimum wage in the Congo has increased from 40,370 XAF to 100,750 XAF in 2015 [4], no caesarean section has met all the criteria of the cesarean section of quality at the Teaching Hospital of Brazzaville because of its high cost compared to the income of the population. In Benin, in a context of free of charge caesarean section, authors report that families spent, during cesarean section, from 0 to 200,000 XAF [6]. This could be explained by the underestimation of the cost of cesarean section during the implementation of the policy of free cesarean section where the beneficiaries pay for prescriptions and / or consumables which are not included in the predefined package (100,000 XAF which is the official cost of the package, this amount must be increased by 90,030 XAF, thus the final cost being 190,030 XAF) [7].

Ouedraogo [8] reported 66.9% of cesarean section of quality versus 33.3% of cesarean section of poor quality using the same criteria as we did.

Nearly half of the patients (47.8%) were admitted in emergency, they were referred by other hospitals of Brazzaville. In almost all cases (90.8%), the transportation was via non-medical means; this worsens the maternal and fetal prognosis [8]. In the literature, there is no unanimity in the number of referred patients: 61.4% in Burkina Faso [9], 26.4% in Senegal [10], 16.1% in Morocco [11]. The difference of these rates may be related to the organization of health systems.

According to some authors [5], the use of health services in the Congo is rather low 23.8%, reasons for dissatisfaction being: their high cost 37.5%, the long waiting time 33.7%, poor quality of reception 22%, lack of essential drugs 20.5%, ineffective treatments 18.5%, and lack of trained staff 6.9%.

We faced difficulties to accurately determine the accurate time for the management in some cases. In fact, some referred patients were admitted without a referral record and were not aware about the departure time from the referring health care center. A delay of the DDI (that's time between the decision and the delivery of the caesarean section) was noted. It took at least 45 minutes and at most 3 days and 6 hours to perform a caesarean section.

The time to perform the procedure in most of patients was 240 minutes (4 hours); the reason being the lack of the needed essential drugs.

Of note, 10 out of 27 (37%) fetal deaths occurred while waiting for drugs needed for the caesarean section. There is a real "professional stress of cesarean section" at the Teaching Hospital of Brazzaville: staff members on duty are obliged to be running between the pregnant woman and her family to "negotiate" the purchase of drugs and / or to give information which likely may contribute to its purchase.

The delay to perform emergency caesarean sections has been reported by other African authors [13], while in the West, the mean DDI time is 43 minutes [14].

According to the Congolese household survey [5], reasons for not consulting a health service are: lack of interest 86.5% in all respondents, remoteness of health facilities in 1.5%.

Incorrect caesarian sections accounted for 4% of indications. They increase the risk of complications for mothers and their children, as well as public expenditures linked to country subsidies.

The postoperative infection was quite considerable and even one maternal death was noted.

This hinders the quality of the caesarean section. The risk of maternal death is estimated in developing countries at 1 in 10, while it is 1 in 7300 in developed countries [15]. The goal of free caesarean section being to improve access to care, the volume of activities in hospitals increases without an increasing of the number of staff members [16].

A policy of caesarean section free of charge, without an accompanying program to improve the quality of obstetric care, is not necessarily followed by a rapid reduction in maternal and neonatal mortality. The lack of motivation of staff sometimes leads some practitioners to include additional (fake) fees payable by recipients of free caesarean section [17].

The first indication for caesarean section in this study is fetal distress, followed by previous caesarean delivery and placenta previa. The absence of a pediatrician in the caesarean section

room, makes that the midwife is obliged to care for the newborn (whose actions are limited to aspirations-disobstruction), this increases fetal morbidity and mortality. For the management of placenta previa which often was haemorrhagic in this study, we had difficulties in the supply of blood products. Yet the National Center for Blood Transfusion statistics, recognize that the Obstetrics and Gynecology department comes in third position in terms of utilization of blood products due to the management of haemorrhagic diseases, after pediatrics and surgery [12].

The fact of just having one team of anesthetic nurses for all Surgical and Obstetrical emergencies lengthens the time of the management and impairs the quality of the caesarean section.

In 79.5% of cases, we used a general anesthesia and in 20.5% of cases a regional anesthesia was performed. Cissé in Dakar found rates close to ours: 24.7% of regional anesthesia and 75.3% of general anesthesia [17]. This trend should be reversed, since general anesthesia has been found to be a risk factor for non-quality caesarean section.

The hospital stay was 7.7 ± 3.9 days; which corroborates with the practice of other African authors such as Fasubaa in Nigeria [18] and Merchaoui in Morocco [19].

The cost of caesarean section was underestimated because it did not take into account other factors such as: food for patients, the cost of transportation of parents visiting and providing food for patients, and the cost of the neonate care in case of neonatal unit referral.

Conclusion

Apart from the impoverishment of the population, caesarean section of quality at the Teaching Hospital of Brazzaville depends also on the maternal condition on admission, which is often worse, on the mode of admission and the type of referral, on the long decision-to-delivery interval time and frequent practice of general anesthesia which are factors that further deteriorate the quality of caesarean section. The criteria of quality are not respected for the pre and the postoperative complications, for indications especially for incorrect indications.

The improvement of the health system and the standard of living are the pledge of the practice of the caesarean section of quality.

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Table I: Indications of the caesarean section at the Teaching Hospital of Brazzaville

	Frequency	Percent
Mandatory caesarean section	96	38.6
Cephalo-pelvic disproportion	22	8.8
Placenta prævia	32	12.9
Malpresentation	20	8.0
Uterus pre-rupture	11	4.4
Generally narrowed pelvis	11	4.4
Cautious caesarean sections	116	46.6
Previous caesarean sections	37	14.9
Fetal distress	52	20.9
Breech presentation	19	7.6
Precious child	8	3.2
Caesarean sections of necessity	27	10.8
Hypertension	7	2.8
Eclampsia	11	4.4
Obstructed labor	7	2.8
Maternal disease	2	0.8
Incorrect caesarean sections	10	4.0
Total	249	100

Table II: Postoperative complications of caesarean sections at the Teaching Hospital of Brazzaville

Maternal	Frequency (n=61)	Percent
<i>Per-operative</i>		
Haemorrhage of delivery <i>Post-operative</i>	5	8.2
Endometritis	35	57.4
Endometritis + parietal suppuration	6	9.8
Parietal suppuration	6	9.8
Vesico-vaginal fistula	2	3.3
Endometritis + Suppuration + Fistula	1	1.7
Haemorrhage of delivery+ Suppuration	1	1.7
<i>Other*</i>	5	7.1

*The five cases classified as other were: 1 death, 1 hypertension, 2 eclampsia, 1 puerperal psychosis.

Table III: Risk factors for non-quality caesarean section

Factors	Mean		Difference	t-Student	P	Signification
	Yes	No				
RA	64.8	57.3	7.5	0.64	0.51	NS
AD	124.2	179.1	- 54.9	1.17	0.24	NS
DD	470	299.8	170.6	2.95	0.003	VS
Mean interval	602.6	532.3	70.3	0.86	0.38	NS
Age	25.7	29.1	- 3.4	4.02	10 ⁻⁵	TS
Parity	2.3	2.2	0.2	0.33	0.74	NS

NS = non significant, VS= very significant

RA: interval from referral to arrival, AD: interval from arrival to decision of performing the caesarean section, DD: interval from decision to delivery of baby.

Table IV: Model of non-qualité caesarean section (logistic regression)

Variable	Bi	Se ^{Bi}	OR = e ^{Bi}	CI at 95%	P
ASAI	0.75	0.35			0.03
ASAI	2.68	1.10	2.11	[1.05- 4.24]	0.01
DD	0.001	0.0005	14.66	[1.69- 126.94]	0.01
General Anesthesia	0.79	0.40	1.001	[1.00-1.001]	0.05
Referred	1.13	0.30	2.20	[0.99 – 4.90]	0.0002
Constant	- 2.16	0.44	3.11	[1.71 – 5.64]	0.0000

Chi-square test of the likelihood ratio = 45,91, Degree of freedom 5, P=00000

β_i coefficient of variable (risk factor), Se^{β_i} = Standard deviation of the coefficient,

p = Probability linked to Likelihood Ratio Test