Determinants of the Quality of the Cesarean Section in Mbuji-Mayi City (Democratic Republic of Congo)

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Abstract

Objective: The overall objective of this study was to make a small contribution to improving the health of mothers and children. **Method:** This is a transversal descriptive study, which took place in the city of Mbuji-Mayi, exactly in the general reference hospitals of this city during the period from March 13 to June 12, 2017, on a sample of 103 cases of cesarean sections. The determinants of the quality of the cesarean section were found by the bivariate analyzes on SPSS. **Results:** After collecting and analyzing data, we arrived at the results according to which: The cesarean section rate is 8.9%, the fairly good, low and medium quality cesarean section represented 51.5%, 2.9% and 45.6% respectively and if the operating room was available, the probability of having a mid-quality cesarean was 90 times higher ($p < 0.001$), 14 times higher in the case of a mother and child alive than in the event of death of the child ($p < 0.001$) and 4.3 times weak or fairly good with an ineffective kit ($p < 0.001$). **Conclusion:** The cesarean section rate is 8.9% and the determinants of quality cesarean section were: the availability of the operating room, mother-child prognosis and the availability of the operating kit. These results will help decision-makers in health matters to train and retrain health personnel, particularly midwives, on the benefits of prenatal consultation and its objectives, timely referral, and on the quality of work supervision.

1. Introduction

Maternal and child health (MCH) is both an indicator and an essential factor for socio-economic and human development. It is also a fundamental human right. This concept occupies a central place in the Millennium Development Goals (MDGs) and is taken up in the Sustainable Development Goals (SDGs) [1]. However, the health situation of the mother and child is still worrying. Indeed, since the 20th century, the United Nations estimates that more than 10,000,000 women die from complications related to pregnancy and childbirth. The World Health Organization [2] maintains that 1500 women die every day from complications linked to pregnancy and childbirth such as: abortions, premature deliveries, postpartum hemorrhages, vesico-vaginal fistulas, maternal death etc. In 2005, she reported that Asia and Africa together accounted for approximately 95% of maternal deaths and almost 90% of neonatal deaths, representing a mortality rate of 300 to 1500 cases per 100,000 births live versus less than 10 cases in developed countries.

To manage these maternal complications, clinicians administer emergency obstetric care, including cesareans. These clinicians attribute benefits such as preventing vaginal or perineal damage, avoiding an emergency cesarean, and the risks of unsuccessful vaginal birth. Despite the benefits they offer to patients, newborns and families, these surgical techniques also have pathological repercussions on the health of the mother and child, as well as social problems [3].

The WHO group of experts, meeting in Geneva on October 8th and 9th days, 2014, made the recommendations related to the practice of cesarean section: the quality of care, particularly in terms of safety, remains an important factor to consider when analyzing cesarean and mortality rates; the risk of infection and complications due to surgery are potentially dangerous, particularly in places that do not have the infrastructure and/or capacity necessary to guarantee surgical safety.

The practice of cesarean section has been the subject of controversy and discussion for several years. Its frequency has increased very rapidly in the medicalized countries of Europe and North America [4] [5], but also in certain developing or emerging countries, for example Brazil where the figures reach or even exceed 50% of the frequency of cesarean section.

These high frequencies have given rise to numerous evaluative studies in

the world, defining the determinants of cesarean section, in particular on: the risks and benefits, the causes of the inflation of this intervention, the legitimacy of some of its indications, the differences between the Cesarean sections in emergency and those which are planned, the Cesarean section techniques without forgetting the outcome of the Cesarean sections in terms of maternal and perinatal morbidity and mortality linked to the quality of these.

Often, despite the urgency of the cesarean, there are almost rapid execution problems, the consequences of which are uterine rupture, a serious situation endangering the life of the fetus and the mother.

The multifaceted crises that the DRC has experienced have affected all sectors, particularly the health sector. A study on the cesarean section and especially on the determinants of its quality in the General Reference Hospitals of the city of Mbuji-Mayi would not be without interest.

The overall objective of this study was to make a small contribution to improving the health of mothers and children. She set herself the following specific objectives:

- Determine the frequency of the cesarean;
- Identify the characteristics of women under cesarean;
- To determine the maternal and fetal prognosis of the cesarean operation.

2. Material and Method

2.1. A Framework

Our study was conducted in the Democratic Republic of Congo, specifically in the diamond town of Mbuji-Mayi which is the head town of the province of Kasaï Oriental.

2.2. Type of Study

This is a cross-sectional descriptive study, which took place in the city of Mbuji-Mayi, precisely in all general hospitals of reference of this city during the period from 13 March to 12 June 2017 is for 3 months.

2.3. Study Population

The population of our study consists of all parturients admitted to Gyneco-obstetrics services in all general hospitals of reference in the city of Mbuji-Mayi for the diagnosis of cesarean section. Scheduled cesareans were also considered.

- Selection criteria
  a) Inclusion criteria:
  Included in this study are:
  ➢ The parturients whose cesarean section was given and whose operation took place in one of the HGR maternity wards in the city of Mbuji-Mayi;
  ➢ Newborns from these cesarean sections;

- ➢ All cesarean women who agreed to participate in the study;
- ➢ Having given birth in one of the maternity wards of the hospitals targeted by our study.

b) Non-inclusion criteria:

- ➢ Parturients operated in another structure and sent for care;
- ➢ Laparotomies for frank uterine rupture with expulsion of the conception product into the large abdominal cavity.

2.4. Data Collection and Analysis

The study was submitted to the authority of the chief of the provincial health division of Kasaï Oriental and the managers of the general reference hospitals (GRH) (Doctors Chief of the health zones and administrators managers of the GRH). All information relating to women under cesarean section was confidential and accessible only to the investigator and the research team.

The data was subjected to quality control which consisted of regular verification and validation every day. They were collected and processed using Epiinfo 2007 software, SPSS and Excel 2007 which allowed us to carry out descriptive analyzes and those of various kinds.

The following statistical measurements were carried out: the frequencies for the qualitative variables and the means, the standard deviation, the Odd ratio (OR) and its confidence intervals (IC) for the quantitative variables,

To assess the quality of the Cesarean section, we proceeded by 2 approaches:

1st Approach:

Given our local conditions, we have selected a number of process and result indicators that meet the requirements and expectations for performing a quality cesarean.

The conditions of treatment: the period of treatment, the availability of the kit, the availability of the nursing staff, the availability of the operating room and the availability of blood.

Carrying out and results of the intervention: the quality of the operator, the quality of the anesthesia, the relevance of the operating indications, intraoperative complications, the life of the mother and child and the APGAR from newborn to birth.

Post-operative follow-up: compliance with the post-operative protocol, immediate post-operative surveillance, post-operative complications, length means of hospital stay and score scoring (0 to 3) was done for the criteria identified above.

2nd Approach:

The quality level of the cesarean sections was determined from the scores obtained during the performance of the discriminating variables.

The Analysis focused on a scale where caesareans are said:

"Good Quality" if all the discriminatory variables have been performed;

"Average" and "Poor or fairly good" if at least one of the discriminatory variables is not achieved.

2.5. Ethical Considerations

In contacts with women under cesarean section, an investigator explained to them the merits of the research by giving them the assurance of anonymity in their statements as well as the confidentiality of the information recorded on the collection instruments provided by the women participants to obtain their free consent. The investigator explained to the participants the importance of the study and the results will only be used for scientific purposes.

3. Results

3.1. Descriptive Analysis

As shown in Table 1, the cesarean section rate was 8.9%, the mean age of our respondents was 28.9 ± 7.2 years (the age group 20 to 35 years more represented with 65%, the mean parity was 4.0 ± 3.2 children (the pauciparous were more represented with 29.1% each), the gravidity's mean was 4.7 ± 4.3 pregnancies (the large multigests took the lead with 28.2%, 15, 5% of caesareans had a history of abortion and 17.5% had a scar uterus.

Table 2 shows that 98.0% of women with cesarean section had followed Prenatal consultations and 52.4% of them had performed 4 sessions or more, in 90.3% of cases hemoglobin was performed, 64.1% of women respondents had been vaccinated, 89.3% had not suffered during pregnancy, 93.2% had not had a hypertension attack and 96.1% had not had anemia during pregnancy.

It should be noted in Table 3 that 95.1% of women surveyed had a good general condition, the mean of uterine height was 33.4 ± 3.7 cm (71.8% had less than 36 cm) and the mean gestational age was 38.5 ± 2.4 weeks of amenorrhea (in 77.7% of cases was between 37 - 42 weeks), 53.4% of the caesareans had regular contractions and the fetal movements were active at 84.5%, the noises of the fetal hearts were regular in 73.8% of cases, cesarean section was performed in an emergency at 89.3%, the indication that came to mind was the transverse presentation with 32.0% and 90.3% of women had a pelvis normal.

Table 4 reveals that the fetal presentation was cephalic at 68.9%, of which 62.1%

Table 1. Cesarean section rate and characteristics of the parturient.

Variables	Workforce (n = 103)	%
Cesarean section frequency		
Cesarean	103	8.9
Eutocic delivery	1150	91.1
Woman's age (years)		
<20	12	11.7
20 to 35	67	65.0
>35	24	23.3
Means	**28.9 ± 7.2 (years)**	

Continued

Parity		
Primiparous	27	26.2
Pauciparous	30	29.1
Multiparous	23	22.3
Large multiparous	23	22.3
Mean	**4.0 ± 3.2**	
Gravidity		
Gravida	26	25.2
Paucigestes (2 - 3)	26	25.2
Multigravidae (4 - 5)	22	21.4
Multigravidae large (≥6)	29	28.2
Mean	**4.7 ± 4.3**	
Abortion		
Yes	16	15.5
No	87	84.5
History of Cesarean		
Yes	18	17.5
No	85	82.5

Table 2. Features related to pregnancy monitoring.

Variables	Workforce (n = 103)	%
Follow EIC		
Yes	101	98.0
No	2	2.0
Number of CPN		
<4	47	47.6
≥4	54	52.4
Hemoglobin		
Yes	10	9.7
No	93	90.3
Hypertension		
Yes	7	6.8
No	96	93.2
Anemia during pregnancy		
Yes	4	3.9
No	99	96.1

Table 3. Characteristics linked to the admission diagnosis.

Variables	Workforce (n = 103)	%
General condition		
Well	98	95.1
Weathered	5	4.9
Uterine height		
<36 cm	74	71.8
≥36 cm	29	28.2
Mean	**33.4 ± 3.7**	
Gestational age in Amenorrhea Weeks		
<37	20	19.4
37 to 42	80	77.7
>42	3	2.9
Mean	**38.5 ± 2.4**	
Uterine contractions		
Regular	55	53.4
Irregular	36	35.0
Absent	12	11.7
Cesarean section indications		
Stationary expansion	1	1.0
Placenta prævia	9	8.7
Headquarters presentation	7	6.8
Cross-functional presentation	33	32.0
Cord procidence	1	1.0
Dynamic dystocia	9	8.7
Fetal suffering	15	14.6
Pelvic fetal disproportion	14	13.6
Eclampsia	1	1.0
Other	13	12.6
Basin condition		
Normal	93	90.3
Unnatural	10	9.7
Fetal movements		
Active	87	84.5
Not active	16	15.5
BCF		
Regular	78	73.8
Irregular	8	7.8
Imperceptible or absent	19	18.4
Type of Cesarean		
Emergency	92	89.3
Scheduled	10	9.7

Table 4. Distribution of data according to characteristics.

Variables	Workforce (n = 103)	%
Fetal presentation		
Cephalic	71	68.9
Seat	7	6.8
Transverse	25	24.3
Degree of commitment		
Yes	64	62.1
No	39	37.9
Erasing the cervix		
Yes	98	95.1
No	5	4.9
Expansion phase		
Active	61	59.2
Latency	42	40.8
State of membranes		
Broken	42	40.8
Intact	61	59.2
Appearance of Amniotic Liquid		
Clear	60	58.3
Meconial	13	12.6
Tinted	16	15.5
Bloody	14	13.6

were engaged, the cervix was obliterated at 97.1% in most cases, 59.2% of the respondents were during the active phase of their dilation, at 59.2% the membranes were intact and the appearance of the Amniotic Liquid was clear at 58.3%

Table 5 indicates that 48% of cesarean women were evacuated in emergency, 60.2%, had come by motorbike, the mean cost of cesarean section was 214 260.7 ± 99 157.4 FC (233 ± 107 USD), the mean time between reference and admission was 71.3 ± 46.3 minutes, the mean time between admission and decision was 87.3 ± 214.6 minutes, the time between decision and intervention was on mean 55.3 ± 80.9 minutes and the mean intervention time was 63.5 ± 21.2 minutes.

These results (Table 6) show that the cesarean section was performed by the general practitioner in 98.1% of the cases and under general anesthesia in 98.1%, 98.1% of them were performed without incident, 73.8% of respondents didn't benefit from induction antibiotic therapy, 97.1% of the blood was not available and the operating kit was available in 37.9% of cases, the postoperative continuation was 91.3% simple, at 100% the maternal prognosis was good, and the means

Table 5. Distribution of data according to accessibility to reference maternity.

Variables	Workforce (n = 103)	%
Mode of admission		
One came	42	40.8
Reference	11	10.7
Evacuated	50	48.5
The mode of transport		
Motorbike	62	60.2
Cost of Cesarean		
<100,000 FC	4	3.9
≥100,000 FC	99	96.1
Mean	214,260.7 ± 99,157.4 FC	
Time between reference and admission		
<60 minutes	23	22.3
≥60 minutes	80	77.7
Mean	71.3 ± 46.3 minutes	
Delay between admission and decision		
<60 minutes	89	86.4
≥60 minutes	14	13.6
Mean	87.3 ± 214.6 minutes	
Time between decision and intervention		
<60 minutes	89	86.4
≥60 minutes	14	13.6
Mean	55.3 ± 80.9 minutes	
Duration of intervention		
<60 minutes	50	48.5
≥60 minutes	53	51.5
Mean	63.5 ± 21.2 minutes	

Table 6. Characteristics linked to the surgical act and post-operative monitoring.

Variables	Workforce (n = 103)	%
Block availability		
Available	49	47.6
Not available	54	52.4
Qualification of the surgeon		
Obstetrician	2	1.9
General practitioner	101	98.1
Type of anesthesia		

Continued

General	101	98.1
Locoregional	2	1.9
Incident during the intervention		
Yes	2	1.9
No	102	98.1
Induction antibiotic therapy		
Yes	27	26.2
No	76	73.8
Blood availability		
Blood product available as needed	3	2.9
Blood product not available as needed	100	97.1
Availability of the operating kit		
Available	39	37.9
Not available	64	62.1
Post-operative follow-up		
Simple	94	91.3
Complicated	9	8.7
Maternal prognosis		
Well	103	100.0
Duration of hospitalization		
≥7 days	103	100.0
Means	18.3 ± 6.4 days	

hospital stay was 18.3 ± 6.4 days.

Table 7 indicates that 97.1% of the newborns were in good condition at birth, among them 63.1% were not resuscitated, their means weight was 3244.8 ± 729.3 grams (those who had normal weight led with 78.6%) most newborns had no birth defect in 99.0% of cases and the prognosis for the newborn was 79.6% satisfactory.

Table 8 shows that 51.5% of the cesarean sections had a fairly good quality while 45.6% had an average quality.

3.2. Bivariate Analysis Results

Analysis of this Table 9 shows that there is not a relationship between socio-demographic characteristics and quality cesarean section. The method of admission does not influence the quality cesarean section (p > 0.05).

It should be noted in Table 10 that gestational age, dilation, condition of the water pocket as well as the type of cesarean are not significantly related to quality

Table 7. Characteristics linked to the newborn.

Variables	Effectif (n = 103)	%
State of the newborn at birth		
Well	3	2.9
Bad	100	97.1
Resuscitation of the newborn		
Yes	38	36.9
No	65	63.1
Weight of newborn (grams)		
Normal weight	81	78.6
Low weight	10	9.7
Macrosomia	12	11.7
Means	3244.8 ± 729.3 grams	
APGAR 5		
<7	61	59.2
≥7	42	40.8
Congenital malformation		
Yes	1	1.0
No	102	99.0
Newborn prognosis		
Satisfactory	82	79.6
Bad	21	204

Table 8. Distribution of cases by quality of cesarean section.

Quality of cesarean section	Workforce	%
Pretty good	53	51.5
Low	3	2.9
Average	47	45.6
Total	103	100.0

Table 9. Socio-demographic characteristics of women and those related to maternity access.

Variables	Bundled Cesarean Quality		OR/IC	p
	Poor or fairly good (n = 56)	Average (n = 47)		
Woman's age				
<20 years	8 (66.7%)	4 (33.3%)	0.44 (0.12 - 1.5)	0.206
20 - 35 years	34 (50.7%)	33 (49.3%)		
>35 years	14 (58.3%)	10 (41.7%)	1.23 (0.48 - 3.10)	0.656

Continued

Parity				
Nulliparous	2 (66.7%)	1 (33.3%)	0.46 (0.16 - 1.33)	0.152
Primiparous	17 (63.0%)	10 (37.0%)		
Pauciparous	12 (44.4%)	15 (55.6%)		
Multiparous	11 (47.8%)	12 (52.2%)		
Large multiparous	14 (60.9%)	9 (39.1%)	1.48 (0.57 - 3.86)	0.413
Gravidity				
Gravida	16 (61.5%)	10 (38.5%)	0.76 (0.37 - 1.65)	0.494
Paucigestes	14 (53.8%)	12 (46.2%)		
Multigravidae	9 (40.9%)	13 (59.1%)		
Multigravidae large	17 (58.6%)	12 (41.4%)		
History of Cesarean				
Yes	8 (44.4%)	10 (55.6%)	0.617 (0.22 - 1.72)	0.352
No	48 (56.5%)	37 (43.5%)		
Condition				
Well	53 (54.1%)	45 (45.9%)	1.27 (0.20 - 7.26)	0.795
weathered	3 (60%)	2 (40%)		
Mode of admission				
One came	27 (64.3%)	15 (37.7%)	0.50 (0.22 - 1.12)	0.093
Evacuated	6 (54.5%)	5 (45.5%)		
Reference	23 (46.0%)	27 (54.0%)	0.54 (0.25 - 1.16)	0.111
Mode of transport				
Feet	32 (51.6%)	30 (48.4%)	1.32 (0.59 - 2.93)	0.489
Motorbike	23 (59.0%)	16 (41.0%)		
Bike	1 (50.0%)	1 (50.0%)		
Delay between admission and decision				
<60 minutes	48 (53.9%)	41 (46.1%)	0.87 (0.28 - 2.73)	0.823
≥60 minutes	8 (57.1%)	6 (42.9%)		
Time between decision and intervention				
<60 minutes	52 (58.4%)	37 (41.6%)	0,87 (0.28 - 2.74)	0.037
≥60 minutes	4 (28.6%)	10 (71.4%)		
Duration of intervention				
<60 minutes	26 (52.0%)	24 (48.0%)	0.831 (0.38 - 1.81)	0.639
≥60 minutes	30 (56.6%)	23 (43.4%)		

Table 10. Characteristics related to childbirth.

Variables	Bundled Cesarean Quality		OR/IC	p
	Poor or fairly good (n = 56)	Average (n = 47)		
Gestational age (weeks)				
<37	10 (50%)	10 (50%)	1.2 (0.46 - 3.30)	0.662
37 to 42	44 (55%)	36 (45%)		
>42	2 (66.7%)	1 (33.3%)	0.42 (0.01 - 5.79)	0.479
Dilation				
Yes	23 (54.8%)	19 (45.2%)	1.027 (0.46 - 2.26)	0.947
No	33 (54.1%)	28 (45.9%)		
State of the membranes				
Broken	27 (47.4%)	30 (52.6%)	0,528 (0.23 - 1.16)	0.112
Intact	29 (63.0%)	17 (37.0%)		
Type of Cesarean				
Urgent	48 (52.2%)	44 (47.8%)	0.468 (0.11 - 1.92)	0.283
Program	7 (70.0%)	3 (30.0%)		

Table 11. Characteristics linked to the surgical procedure.

Variables	Bundled Cesarean Quality		OR [IC to 95%]	p
	Poor or fairly good (n = 56)	Average (n = 47)		
Block availability				
Available	49 (100%)	0 (0%)		
Not available	4 (7.4%)	50 (92.6%)	Indeterminate	<0.001
Blood availability				
Available	2 (66.6%)	1 (33.3%)	1.9 (0.14 - 57.8)	0.592
Not available	51 (51%)	49 (49%)		
Type of anesthesia				
General	54 (53.5%)	47 (46.5%)	0.53 (0.44 - 0.64)	0.191
Spinal anesthesia	2 (100.0%)	0 (0.0%)		

cesarean because (p > 0.05).

After analyzing this Table 11, we note that the time between admission, intervention and the type of anesthesia is not significant for quality cesarean.

Table 12 shows that the availability of the block (p < 0.001), the absence of maternal death (p < 0.001) and the effectiveness of the operating kit (p < 0.001) are the determinants of quality cesarean section.

Table 12. Determinants of the quality of the cesarean section

Variables	Bundled Cesarean Quality		OR/IC	p
	Poor or fairly good (n = 56)	Average (n = 47)		
Care score				
Greater than 1 hour	3 (30.0%)	7 (70.0%)	0.32 (0.08 - 1.33)	0.103
Less than 1 hour	53 (57.0%)	40 (43.0%)		
Block availability score.				
Available	6 (10.7%)	43 (91.5%)	89.5 (23.0 - 338.4)	<0.001
Not available	50 (89.3%)	4 (8.5%)		
Care staff availability score				
Guard team present and complete	3 (33.3%)	6 (66.7%)	0.38 (0.09 - 1.64)	0.185
guard team present and incomplete	53 (56.4%)	41 (43.6%)		
Anesthesia quality score				
Presence of complications	1 (50.0%)	1 (50.0%)	0.84 (0.05 - 13.7)	0.900
absence of complications	55 (54.5%)	46 (45.5%)		
Blood availability score				
Not available	53 (53.0%)	47 (47.0%)	0.53 (0.44 - 0.64)	0.107
Available	3 (100.0%)	0 (0.0%)		
Complication score				
Presence	3 (33.3%)	6 (66.7%)	0.38 (0.09 - 1.64)	0.185
per and postoperative absence	53 (56.4%)	41 (43.6%)		
Mother-child prognosis score				
living mother and deceased child	2 (11.1%)	16 (88.9%)	13.9 (3 - 64)	<0.001
mother and child alive	54 (63.5%)	31 (36.5%)		
Score kit				
Effective	39 (100%)	0 (0%)	4,3 (2.98 - 8.65)	<0.001
Ineffective	17 (30.4%)	47 (69.6%)		
Quality of Cesarean				
Pretty good	45 (86.5%)	7 (13.5%)	0.34 (0.09 - 1.64)	0.420
Low	3 (100%)	0 (0%)		
Average	44 (93.6%)	3 (6.4%)		

4. Discussion

4.1. Results of Descriptive Analyses

In our series, the cesarean section rate was 8.9% (Table 1). This rate is within the limits set by the WHO, which recommends 5% to 15% for cesareans. However, they were lower than those found by [6] according to which in Switzerland the rate of cesarean section was above 10%. On the other hand in Quebec, the rate of

cesarean was at 24.9% in 2016. This would be due to the fact that in the industrialized countries, the cesarean by convenience is already liberalized and many women prefer this mode of childbirth compared to the vaginal delivery.

The mean age of our respondents was 28.9 ± 7.2 years (Table 1). These results are higher than those found by [7] in his series, the mean age of the respondents was 26.1 years. This would be due to the fact that this age group is the most active for fertility.

The mean parity was 4.0 ± 3.2 children (Table 1). These results do not corroborate those found by [8] who stipulate that the mean parity was 1.6 children. And the gravidity mean was 4.7 ± 4.3 pregnancies (large multigravidae led 28.2%) (Table 1). This is justified by the fact that our study is carried out in the town of Mbuji-Mayi which is an area of high popular density with a very high birth rate.

The history of abortion involved 15.5% of cesareans and 17.5% had a scar uterus (Table 1). These results are close to those of [9] who found that 18.6% of women with cesarean section had a history of cesarean section. In contrast, [8] found in their series that 40.8% of cesareans had at least one scar uterus. This would be due to the fact that in our environments, accessibility to reference care is not easy.

In terms of pregnancy monitoring, 98% of women with cesarean section had undergone CPN and 52.4% had had 4 or more sessions (Table 2). These results differ from those found by [8] who mention that 92.7% of cesareans had followed the CPN and 68% of them had carried out at least 3 sessions during pregnancy. This would be due to a good organization of our health system which allows all women access to the CPN.

In 90.3% of the hemoglobin tests were carried out, 64.1% of the women surveyed had been vaccinated, 11.7% had suffered during pregnancy, 6.8% had had a hypertension attack and 3, 9% had experienced anemia during pregnancy (Table 2). These results do not corroborate those found by [10] who in their series of less than 50% hemoglobin was performed, the caesareans were vaccinated at 54%, 2.4% had hypotension. This would be due to the fact that their study was carried out in the rural environment where the monitoring of the pregnant woman is weak.

General condition of women with Caesarean section on admission was good in 95.1% of cases (Table 3). These results do not agree with those of [8] who had found for their series that 82.2% of women with cesarean section were admitted in good condition.

The mean uterine height was 33.4 ± 3.7 cm (71.8% was less than 36 cm) (Table 3). These results are superior to those found by [9] according to which her respondents had a mean of uterine height of 31.97 ± 3 cm (i 32.60 ± 3.40 cm for cesareans and 31.04 ± 2.56 cm for the lower tracks). These differences would be justified by the small sample size.

The mean gestational age was 38.5 ± 2.4 weeks of amenorrhea (in 77.7% of

cases was between 37 - 42 weeks) (Table 3). These results are similar to those found by [10] who in their series had a gestational age mean of 38.58 ± 2.45 weeks. This would be a coincidence.

53.4% of the women surveyed had regular contractions, 84.5% had active fetal movements and noises of the fetal heart were regular in 73.8% of cases (Table 3). These results are similar to those of [8], *i.e.* 87.9% of regular BCF and fetal movements were active at admission at 82%.

We found that 89.3% of cesarean sections were performed in an emergency, the main indication for cesarean section was the transverse fetal presentation with 32.0% (Table 3). On the other hand [11] found acute fetal suffering (15.38%) as the main indication. While [12] who had found in their series the indication related to cervical dystocia at 16.1%, This diversity of indication would be explained by the obstetrician's concern to give birth to a child free from anoxia or trauma.

The fetal presentation was 68.9% cephalic (Table 4). On the other hand [9] found that 96.9% of children were in cephalic presentation. It would seem to be a coincidence.

According to the progression of the fetal mobile, the degree of engagement was 62.1%, the cervix was obliterated at 97.1% in most cases and 59.2% of the respondents were during the active phase of their dilation (Table 4). On the other hand [10] had found that 51.96 d% of women with cesarean section were during the latency phase

At admission, most women with cesarean section had 59.2% intact membranes and the vast majority of those with ruptured ruptures, the appearance of amniotic liquid was clear at 58.3% (Table 4). These results are lower than those found by [13] according to which the membranes were ruptured before the admission of patients into the delivery room at 65.6%. On the other hand Annie F. cited by [13] had found that they were broken at 46.8%. This would be due to the fact that in our environment the system of reference and counter reference suffers especially that the first level care services incarcerate the patients to earn at all costs money hence the late references.

For the most part, respondents were evacuated to emergency at 48.8% (Table 5). These results are lower than those of [8] indicating that women with cesarean section were evacuated in emergency (61.4%). This is because in our environment evacuation is done after the failure of all the maneuvers of the first level health service with regard to emergencies and especially obstetric and neonatal ones.

The vast majority of cesarized women were evacuated by public transport (motorcycle taxi) at 60.2% (Table 5). These same results were found by [7]. It would be due to the impassability of roads in our environment which makes HGR inaccessible by vehicle transport.

The mean cost of cesarean section was 214,260.7 ± 99,157.4 CF in our community (96.1% of cesarean sections cost more than or equal to 100,000 CF)

(Table 5). These results differ from those found by [14] according to which the cost of the cesarean section in Senegal was 90,000 FCFA. This would be justified by the fact that our studies have been carried out in different environments where each health system has its regulation of negotiated prices.

The mean time between reference and admission was 71.3 ± 46.3 minutes therefore 1 hour 11 minutes and the mean time between admission and decision was 87.3 ± 214.6 minutes or 1 hour 27 minutes (Table 5). On the other hand [7] had found that the mean time between admission and decision was 52 minutes and that between the reference and admission was 32 minutes. This would be justified by the poverty that prevails in our environment since it is the patient and/or his family who must cover the cost of transportation, the purchase of the sheet and the operating kit, but religious beliefs and the fear of intervention can also come into play.

The time between decision and intervention was on mean 55.3 ± 8.9 minutes (in 86.4% of cases it was less than 60 minutes) and the mean duration of the intervention was 63.5 ± 21.2 minutes (in 51.5% this duration was greater than or equal to 60 minutes) (Table 5). These results differ from those found by [10] according to which the mean time between the decision and the start of the cesarean section was 26.4 ± 5.48 minutes and the mean duration of the intervention was 57.52 ± 12.14 minutes. This would be due to the scarcity of specialized labor and the material organization which is lame in under-equipped environments like ours.

Cesarean section was performed by the general practitioner in 98.1% (Table 6). On the other hand [15] found in his series that 46.7% of cesareans were performed by obstetricians. This could affect the quality of the cesarean section in our community.

Most cesarean sections were performed under general anesthesia at 98.1% (Table 6). These results are slightly higher than de [15] who found that general anesthesia was more used at 94.9%. [11] found that in 36.5% spinal anesthesia was used in their series. This would be a coincidence as dependent on one surgeon to another.

98.1% of these were completed without incident, and 97.1% of the blood was not available. The operating kit was available in 97.1% of cases (Table 6). These results are inconsistent with those found in [11] [15], according to which the operating kit was 85% available. This would be justified by the fact that our study was carried out in the HGR which offer the Complementary Package of activities and must prepare accordingly.

With regard to antibiotic prophylaxis, 73.8% of respondents did not benefit from it, these results are not a corollary of those found by [11] according to which all the operated patients had benefited from antibiotic prophylaxis made of 2 g of ampicillin. This would be caused by the untimely stock-outs that we know in the HGR of our environment

Postoperative follow-up was 8.7% complicated (Table 6). These results are

lower than those found by [8] according to whom in the postoperative phase 18.8% of those surveyed had complications. This is all the same affirmed by (16) who had found in their series that the operating suite was complicated with the RR: 2.46 [1.32 - 4.59] p = 0.003. This would be justified by the fact that these studies were carried out in different environments where the conditions surrounding the cesarean section are different.

At 100% the maternal prognosis was good (Table 6). On the other hand [16] had found that in emergency the maternal and fetal prognosis is grim than in the caesareans scheduled at the Brazzaville university hospital. As for [12], the maternal death rate was 17.1% compared to uterine ruptures, 2.0% compared to cesarean sections. This would be justified by the fact that our study is more recent which made it possible to adapt the preoperative, per and postoperative care of women undergoing cesarean section to current technology to minimize the risk of death.

Caesarized women were hospitalized on mean for 18.3 ± 6.4 days (100% of our respondents had been hospitalized for 7 days or more) (Table 6).

Regarding the condition of the newborns at birth, 97.1% of them were in good condition, among them 63.1% were not resuscitated (Table 7). In contrast [8] found in their series that the perinatal mortality rate was high (15.9%). This proves the significant advances observed in the fight against maternal and infant mortality in our environment.

The mean weight of the newborns was 3244.8 ± 729.3 grams (those with normal weight led with 78.6%) (Table 7). On the other hand [17] had found that the mean weight in their series was 2286 ± 267 grams (the children of low weight represented 60%). This is justified by the fact that his sample consisted of twin pregnancies for which women were cesarized.

Most of these newborns did not have a congenital malformation in 99.0% of cases and the prognosis of the newborn was satisfactory at 79.6% Table 7). On the other hand [16] had found no case of malformation and that in emergency the maternal and fetal prognosis was grim only in the caesareans scheduled at the CHU of Brazzaville.

51.5% of the caesareans had a fairly good quality while 45.6% had an average quality (Table 8).

4.2. Bi-Varied Analyses

In our series, if the operating room was available, the probability of having an average quality cesarean was 90 times higher (p < 0.001), 14 times higher in the case of a mother and child alive than in the death of the child (p < 0.001) and 4.3 times weak or fairly good with an ineffective kit (p < 0.001) (Table 12). On the other hand [8] found that the cesarean was not of good quality, the post-operative follow-up was not satisfactory, the delay in the decision of the cesarean and in the intervention. As for [7], found for his series that the indications were abusive, the post-operative follow-up insufficient and the maternal and perinatal mortal-

ity high.

5. Conclusions

After collecting and analyzing data, we arrived at the results according to which:

The Caesarean section rate is 8.9%;

The fairly good, weak and average quality cesarean section represented 51.5%, 2.9% and 45.6% respectively.

The determinants of quality cesarean were: the availability of the operating room, mother-child prognosis and the availability of the operating kit. These results will help decision-makers in health matters to train and retrain health personnel, in particular midwives, on the benefits of prenatal consultation and its objectives, timely referral, and on the quality of work supervision.

Conflicts of Interest

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

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