

Research Article

# Factors Associated with Post-caesarean Complications in Emergency of Gynecology-Obstetrics Service of Saint Joseph Hospital in Kinshasa, Democratic Republic of the Congo

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**Abstract:** Caesarean section is the most common surgical procedure in obstetrics, but also in pregnant women with dystocia. The purpose of this study is to identify factors that contribute to post-caesarean complications in emergency of gynecology-obstetrics service of Saint Joseph Hospital in Kinshasa. This is a descriptive cross-sectional study and was conducted at Saint Joseph Hospital in Kinshasa city for a month (1<sup>st</sup> and 30<sup>th</sup> July 2021). A questionnaire was used to collect different data namely socio-demographic characteristics and different variables important for the study. Independent variables were factors related to the parturient and the current pregnancy, the surgical procedure and the operational room. While the dependent variable was post-caesarean complications in gynecology-obstetrics service. Descriptive statistical analyses namely frequency and percentage were done to describe the sample profile. To measure the strength of association between different variables were estimated using Pearson's Chi-Square ( $\chi^2$ ) test and the p-value was 0.05. Data analysis was performed using SPSS version 20 software. The majority of participants are over 33 years of age, have secondary school skills, married and have 3 to 4 children. It was observed that 88.2% of participants have acute respiratory distress prior to caesarean section, 76.6% have a personal history of thromboembolic disease prior to caesarean section. All the participants who underwent caesarean section were victims of external ventilation through the windows of the operating room, which remained open before, during and after the surgery and benefited from antibiotic treatment without any para-clinical analysis before the caesarean section. Furthermore, 82.4% of participants had benefited from the caesarean section with sterilized care materials 48 hours before and after the intervention. While 47.1% of participants had caesarean sections with defective equipment for the operation (use of dry heat sterilization etc.). A better identification of these risk factors can reduce significantly rate of complications and can consequently improve the maternal-infantile prognosis. The obstacles to effective management are related to the provision of quality services.

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## 1. Introduction

Avoided for its alarming mortality rate over a little more than a century ago, caesarean section, is now the mode of delivery for one in three women in the United States and up to four in five women in some other places in the world and more frequent in

developing countries [1]. Approximately eight million women suffer from pregnancy-related complications and more than one million of them die as a result of caesarean section. More than 90% of deaths occur in Asia, Africa, and Latin America. Meanwhile, it should be noted that maternal mortality is higher in Sub-saharan Africa [2].

Worldwide, the rate of caesarean births has increased continuously over the past decades. For instance, the caesarean section rate increased from 15.5% in 1995 to 20.8% in 2010 in France, demonstrating the incidence of related complications. In Morocco, the caesarian section rate increased from 2% in 1992 to 16% in 2011. This clear increase is linked to the evolution of society, but especially to the concern of the obstetrician to deliver a newborn in the best conditions in order to preserve the comfort and good health of the mother [3]. Pregnancy and childbirth are special moments in a woman's life, and involve a vital risk for both the mother and the newborn [4]. Nevertheless, the rate of caesarean delivery has increased significantly worldwide, especially in middle- and high-income countries, where the increase has been greater than in low-income countries [5]. Ideally, the caesarian section rate should be between 10% and 15% in low-income countries. Several factors have contributed to the increase in caesarean section rates worldwide, including improved surgical and anesthetic techniques, reduced risk of short-term post-operative complications, and patient perception of the safety procedure [3, 6].

Epidemic caesareans remember that a rate below 10% and above 15% of births does not have a positive impact on other perinatal outcomes, particularly maternal and neonatal mortality. In a situation with no particular obstetrical risk, compared to a natural delivery, a woman giving birth by caesarean section has twice the risk of hemorrhage, twice the risk of thromboembolic complications, thrice the risk of infection and twice the risk of anesthetic complications [7]. Today, the frequency of caesarean sections is currently 20% of deliveries, and often more, while analgesia techniques, labor management, and the assessment of mechanical dystocia have made decisive progress. The safety of this intervention has become very high thanks to the progress of resuscitation anesthesia, to the mastery of the surgical technique and to the possibility of antibiotic therapy. Despite this, maternal mortality has not disappeared [8].

The indication for caesarean section in Kinshasa city, its performance by a non-specialized operator, and the urgent nature of the procedure are risk factors for the occurrence of these complications. Caesarean section is the most frequently performed surgical procedure in obstetrics and has a significant impact on the lives of women. In Kinshasa, the frequency of caesarean sections is currently estimated at 20% of deliveries, and more, while analgesia techniques, labor management, and the assessment of mechanical dystocia have made decisive progress [9,10]. The purpose of this study was to identify factors contributing to post-caesarean complications in emergency of gynecobstetrics service of Saint Joseph Hospital in Kinshasa.

## **2. Material and methods**

### **2.1. Study area**

This study was conducted at the Saint Joseph Hospital located in Kinshasa city with an average of more than three pregnant women who deliver by caesarean section. It has been notified an average of 2/4 of post-emergency caesarean section complications.

### **2.2. Study design and population**

This is a descriptive cross-sectional study. In fact, we targeted women who delivered through caesarean section and were hospitalized after delivery for more check up. In general; we noted 17 records of caesarised patients, who accepted to participate in this study. Our research focused on the questions related to the GIRERD scale (Questionnaires) and the sampling was a non-probability accidental type.

### **2.3. Data Collection**

Only one category of information was collected: those related to factors favoring post-caesarean complications performed in gynecological emergencies at Saint Joseph Hospital in Kinshasa. Following socio-demographic characteristics were considered: age, education level, marital status and parity. The interview was carried out between 1<sup>st</sup> and 30<sup>th</sup> July 2021.

#### **2.3.1. Definitions of variables**

##### **(a) Independent variables**

###### **Factors related to the parturient and the current pregnancy**

These are the patient's personal history (thromboembolic disease repeated urinary tract infections and the number of uterine scars), premature rupture of the membranes, Age, terrain (maternal morbidity: diabetes, arterial hypertension, pre-eclampsia,...) and repeated vaginal touch. The questionnaire was adapted from the Girard scale.

###### **Factors related to the surgical procedure**

It is a question of emergency, duration of labor (infectious risk is directly proportional), intra-uterine maneuvers (endo-uterine) during labor, obstetrical interventions (caesarean section) and hemorrhage (any hemorrhage greater than 1000 ml during caesarean section is a predisposing factor to infection). The questionnaire was adapted from the Girard scale.

###### **Factors related to the operating room**

These are care materials, the atmosphere of the operating room, aspects related to asepsis and the preparation of the surgical team in all its aspects (hand hygiene, surgical friction etc.). The questionnaire was adapted from the Girard scale.

##### **(b) Dependent variable**

###### **Post-caesarean complications in emergency of gynecology-obstetrics**

These are the consequences follow anemia (abnormally high blood loss intraoperatively (> 1000 CC), infections (parietal suppuration and endometritis), post-operative peritonitis, puerperal sepsis and urinary infection. The questionnaire was adapted from the Girard scale.

### **2.4. Data analysis**

Descriptive statistical analyses like frequency and percentage were performed to describe the profile of the sample. To measure the strength of association between different variables, odds ratios (ORs) were estimated with their CI (95%) using Pearson's Chi-Square ( $\chi^2$ ) test. The p-value was 0.05. Data analysis was performed using SPSS version 20 software.

### **2.5. Ethical Consideration**

After the purpose of the study was clearly explained to the participants, a consent form was given to each of them. Then, they were informed about the confidentiality of their responses and interviews were conducted in a secluded setting. The Ethics Committee of Public Health School of Kinshasa, Faculty of Medicine, University of Kinshasa approved this study.

### 3. Results

#### 3.1. Socio-demographic characteristics of participants

The table below describes socio-demographics characteristics of participants.

**Table 1. Socio-demographic characteristics of participants**

Characeristics		n	%
Age	18 - 25 years	3	17.6
	26 - 32 years	6	35.3
	33 years and more	8	47.1
Education level	Illiterate	3	17.6
	Primary	5	29.4
	Secondary	8	47.1
	University	1	5.9
Marital status	Bachelor	2	11.8
	Married	13	76.4
	Widow	0	0
	Divorced	2	11.8
Parity	1 to 2 pars	0	0
	3 to 4 pars	16	94,1
	More than 5 pars	1	5.9

As observed, the majority of participants are over 33 years old, (47.1%), then followed by the group of 26-32 years old (35.3%) and 18-25 years old (17.6%). While, 47.1% of participants have secondary education followed by 29.4% having primary level. Furthermore, 17.6% of participants have no education and a minority has a university level. As for the marital status, we observed that 76.4% of participants are married, then followed a higher percentage of divorced and single (11.8%). Moreover, 94.1% of participants have 3 to 4 children, compared to 5.9% who have more than 5 children. No participants had less than 2 pars.

#### 3.2. Description of study variables

[Table 2](#) displays factors related to post-caesarean complications.

**Table 2. Factors related to post-caesarean complications**

Factors related to post-caesarean complications	$\frac{n}{17}$	%
Use of antibiotic therapy without para-clinical analysis before caesarean section surgery	17	100
Ignorance of the patient's surgical history	14	82.4
Performs caesarian section on pregnant women over 39 years of age	14	82.4
Caesarean sections performed on patients with co-morbid diseases (hypertension, diabetes mellitus, obesity, etc.)	15	88.2
More than 10 days of hospitalization for caesarised patients	2	11.8
External ventilation through the operating room windows before, during and after surgery	17	100
Mean		69.6

From [Table 2](#), it was observed that 100% of participants who underwent caesarean section were victims of external ventilation through the windows of the operating room,

which remained opened before, during and after the surgical intervention. They also benefited from antibiotic treatment without any para-clinical analysis before the caesarean section. While 82.4% who underwent caesarean section in a field of co-morbid diseases (hypertension, diabetes and obesity), the practitioners were unaware of the surgical history of participants, and some of the participants were over 39 years old.

On average 69.6% of the caesarised patients were exposed to post-caesarean complications performed in emergency of gyneco-obstetrics.

Factors related to the parturient and the current pregnancy is presented in the [Table 3](#).

**Table 3. Factors related to the parturient and the current pregnancy**

Factors related to the parturient and the current pregnancy	$\frac{n}{17}$	%
Patients with personal history(s) of thromboembolic disease prior to caesarean delivery	13	76.5
Personal history of recurrent urinary tract infections in patients prior to surgery	12	70.6
Thrombophilia diseases in caesarean patients	10	58.8
Repeat caesarean sections	12	70.6
Patients having benefited from several vaginal touches before the surgical procedure	9	52.9
Patients with acute respiratory distress	15	88.2
Mean		69.6

It emerges that 88.2% of participants have acute respiratory distress prior to caesarean section, while 76.6% of participants have a personal history of thromboembolic disease prior to caesarean section. In addition, 70.6% of participants have a personal history of recurrent urinary tract infections and recurrent caesarean sections. Meanwhile, 58.8% of participants suffer from thrombophilia diseases and 52.9% had undergone several vaginal touches prior to the surgical intervention. On average, 69.6% of participants had factors that could expose them to post-caesarean complications performed in emergency.

The [Table 4](#) presents factors related to the procedure of surgery to our participants.

**Table 4. Factors related to the surgical procedure**

Factors related to the surgical procedure	$\frac{n}{17}$	%
Most of the newborns had made the prolapse of the cord with fetal suffering	10	58.8
Care materials sterilized 48 hours before and after the caesarean section procedure	14	82.4
Caesarean section lasts more than 12 hours for the majority of patients	0	0
Most of the caesarised patients had a hemorrhage greater than 1000 ml during the caesarean section	4	23.5
Some patients went back to the OR because they forgot a material in the abdomen	2	11.8
Mean		29.4

From the table above, it was observed that 82.4% of participants had benefited from the caesarean section with sterilized care materials 48 hours before and after the intervention, while 58.8% of participants had no newborn presenting a prolapse of the cord with fetal suffering. Moreover, 23.5% of participants had a hemorrhage of more than 1000 ml during the caesarean section and 11.8% of participants returned to the operating room because they forgot a material in the abdomen. Finally, none of participants who

underwent caesarean section remained in the block for more than 12 hours. On average, 29.4% of participants were exposed to post-caesarean complications.

Table 5 is presented factors related to the operating room.

**Table 5. Factors related to operating room**

Factors related to the operating room	$\frac{n}{17}$	%
Surgical equipment in a defective state for the surgical procedure (use of dry heat sterilization etc.)	8	47.1
Arrangement of personnel in the block does not take into account the specialties	15	88
The practicing surgeon is informed only the night before the caesarean intervention	11	64.7
Mean		66.6

From the Table 5, it emerges that 47.1% of participants had caesarean sections with defective equipment for the operation (use of dry heat sterilization etc.), while 88% had block personnel who did not take into account the specialties. So, 64.7% had a caesarean section performed by an improvised surgeon.

## 4. Discussion

### 4.1. Socio-demographic characteristics

It was observed that the majority of participants were over 33 years of age (47.1%), followed by 26-32 years (35.3%). As to the education level, 47.1% of participants have a secondary level while 29.4% have a primary level. Ahmadou et al. [10] reported that 20-29 years range (44.41%) was the most representative group in caesarean women admitted to the Chu Point G hospital in Mali. Moreover, the majority of participants was married (76.4%). Meanwhile, 94.1% of participants have 3 to 4 children, compared to 5.9% who have more than 5 children. Ahmadou et al. [10] found that the majority of his study population was married and had a large percentage of participants having 3-4 children.

### 4.2. Analysis of study variables

#### 4.2.1. Factors related to post-caesarean section complications

As to the factors related to post-caesarean section complications, 100% of participants who underwent caesarean section were victims of external ventilation through the windows of the operating room, which remained open before, during and after the surgical procedure and benefited from antibiotic therapy without any para-clinical analysis before the caesarean section. However, Liu et al. [11] reported that the use of antimicrobial prophylaxis for caesarean section has been shown to be effective in reducing post-operative morbidity, cost and duration of hospitalization. Although the antimicrobial usage is necessary for any woman undergoing a caesarean section but it should be restricted. Meanwhile 82.4% underwent caesarean section in a morbidly ill terrain (hypertensive, diabetic and obese), the practitioners were unaware of the surgical history of the patients, and some of the patients were over 39 years of age. For Togora [12], the selection of resistant bacteria under the selection pressure of antibiotics is a very important step to limit resistance. Thus, these bacteria are among the organisms with multidrug resistance, also called polymedical resistance. Multidrug resistance is thus a step towards therapeutic impasse.

Moreover, 88.2% of participants reported about co-morbid diseases (hypertension, diabetes mellitus, obesity, etc.). On average 69.6% of the caesarean patients were exposed to post-caesarean complications performed in gynecology-obstetrics service. These findings coincide with WHO report [13] stating that personal history of thromboembolic disease, repeated urinary tract infections, thrombophilia and the number of uterine scars

cause post caesarean complications. Infection is the most common complication within the first 10 days after caesarean delivery. The rate of infection without prophylactic antibiotics approaches 85%, whereas the infection rate with prophylactic antibiotics is only about 5% [14,15].

#### **4.2.2. Factors related to the parturient and the current pregnancy**

It was observed that 88.2% of participants with acute respiratory distress before caesarean section compared with 76.6% of patients with personal history(s) of thromboembolic disease before caesarean section. Moreover, 70.6% of participants with personal history of recurrent urinary tract infections and recurrent caesarean sections while 58.8% of caesarised participants suffer from Thrombophilia diseases. Furthermore, 52.9% of participants had undergone several vaginal touches prior to the surgical intervention. On average, 69.6% of participants had factors that could expose them to post-caesarean complications performed in emergency. These findings are similar to those found by the WHO, [16] who reported that the personal history of thromboembolic disease, personal history of repeated urinary tract infections, thrombophilia and the number of uterine scars cause post caesarean complications.

#### **4.2.3. Factors related to the surgical procedure**

It was observed that 82.4% of participants had benefited from the caesarean section with sterilized care materials 48 hours before and after the operation, while 58.8% of participants had a newborn presenting a prolapse of the cord with fetal suffering. However, 23.5% of the caesarized patients had a hemorrhage of more than 1000 ml during the caesarean section and 11.8% of some patients returned to the operating room because a material was forgotten in the abdomen. Finally, none of the caesarized patients remained in the block for more than 12 hours. The operative procedures exposed an average of 29.4% of patients to post-caesarean complications. Merger *et al.* [16] reported that emergency is the main risk of finding any complication in the operation. In fact, the aseptic precautions are the same, except perhaps in extreme emergencies such as the prolapse of cord with fetal suffering, 31% of caesarean sections with an intraoperative complication are followed by an infection.

#### **4.2.4. Factors related to the operating room**

As to the operational room, 47.1% of participants had caesarean sections with defective equipment for the operation (use of dry heat sterilization, etc.), while 88% of participants had operating room personnel who did not take into account the specialties. Moreover, 64.7% of participants had a caesarean section performed by an improvised surgeon. On average 66.6% of participants had a post-caesarean complication due to factors related to the operating room. These findings are consistent with Mariko [17] who illustrated that the indication for the caesarean section, the performance of the caesarean section by a non-specialized operator and the urgent nature of the caesarean section are risk factors for the occurrence of these complications.

### **Conclusion**

Postpartum complications in the emergency postpartum period in the DRC are all too common because of the high morbidity and mortality rates. The results of this study demonstrate that caesarean section is one of the means for reducing maternal and infant morbidity and mortality. It should not be considered as an easy solution, because it is not devoid of morbid maternal and infant complications and can even be fatal. Therefore, policymakers need to put in place interventions to address these challenges in order to reduce maternal and child morbidity and mortality.

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