




Research Article

Factors Associated with Post-cesarean Maternal Complications in the Gynecology-Obstetrics Department of the Ignace Deen National Hospital CHU in Conakry

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Abstract

Introduction: Surgical interventions are essential in certain situations requiring the pregnant woman to be spared the complications of pregnancy or dystocic delivery. The aim of this work was to identify factors associated with post-cesarean maternal complications. **Methodology:** This was a 6-month prospective analytical study, from June 1st to December 31, 2022, carried out in the gynecology-obstetrics department of the Ignace Deen National Hospital of the Conakry University Hospital, involving pregnant and parturient women undergoing cesarean section in the department during the data collection period who had or had not had postoperative complications and agreed to participate in the study. **Results:** The frequency of post-cesarean complications was 8.31%. The mean age of the patients was 26.7±5.93 years. The 25-34 age group was the most represented (49.4%). They were mainly housewives (41.3%), married (95.7%), not in school (43.0%) and evacuated (41.8%). Emergency cesarean section was the most commonly performed (69.0%). Anemia (53.5%), surgical site infection (26.8%) and postpartum hemorrhage (16.9%) were the most frequently recorded complications with a case fatality rate of 0.7%. Factors likely to be associated with the occurrence of post-cesarean complications were obstetric evacuation (OR=2.151; CI: 1.312-3.527), multiparity (OR=3.544; CI: 2.009-6.252), absence of PNC (OR=21.702; CI: 11.012-42.769), prenatal follow-up in health centers (OR=3.027; CI: 1.597-5.737), emergency cesarean (OR=2.619; CI: 1.353-5.067), qualification of the prenatal follow-up agent (OR=7.317; CI: 2.698-19.842) and prolonged labor (OR=2.057; CI: 1.261-3.353). **Conclusion:** The elements likely to influence the occurrence of postoperative complications were obstetric evacuation, multiparity, absence of prenatal consultation, prenatal monitoring in health centers, emergency cesarean section, qualification of the prenatal monitoring agent (health technical agent) and prolonged labor. Raising awareness of the importance of prenatal monitoring, performing prophylactic cesareans in the event of any absolute indication for cesarean section, limiting births, and good monitoring of the immediate postpartum period could reduce the risk of post-cesarean complications.

Keywords

Associated Factors, Cesarean Complications, Ignace Deen, Guinea

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1. Introduction

Interventions are essential in certain situations requiring the pregnant woman to be spared the complications of pregnancy or dystocic delivery. Caesarean section is a surgical procedure that consists of performing an artificial delivery after surgical opening of the uterus, generally approached by abdominal route, exceptionally by vaginal route [1]. It is one of the oldest and most frequently performed surgical procedures on women in the world [2, 3]. However, Caesarean section presents risks of infection 5 to 20 times compared to vaginal delivery [4-6]. Despite scientific progress recorded in all fields, Caesarean section is still not a harmless procedure. Indeed, it can be peppered with complications which include, among others, anemia, urinary tract infection, endometritis, thrombophlebitis, pelvic peritonitis, surgical site infections with an increase in the average length of hospitalization from 2 to 7 days [7]. In developed countries, frequencies of post-caesarean complications of 5.7% and 21.5% have been reported in the literature [8, 9]. In Africa in sub-Saharan Africa, post-caesarean complication rates remain high, ranging between 7.06% and 37.74% according to several authors [10-13]. With post-caesarean maternal mortality rates of 0.92%, 2.8% and 7.6% reported in Mali, Guinea and Gabon respectively [11, 14, 15]. Unfavorable socioeconomic conditions, obstetric evacuations, prolonged labor, premature rupture of membranes, metrorrhagia, the urgent nature of the cesarean section and its long duration of performance are risk factors for post-caesarean complications reported in the literature [10]. Reducing maternal morbidity and mortality related to cesarean section requires early identification of contributing factors in these patients. It is in this context that this work is carried out, the objective of which was to identify the factors associated with maternal post-caesarean complications.

2. Methodology

2.1. Type and Duration of Study

This was a 6-month prospective analytical study, from June 1 to december 31, 2022, carried out in the gynecology-obstetrics department of the Ignace Deen National Hospital of the Conakry University Hospital.

2.2. Study Population

The study focused on pregnant and parturient women undergoing cesarean sections in the department during the data collection period who had or had not had post-operative complications and agreed to participate in the study.

The diagnosis of postoperative complication was made on the basis of clinical and paraclinical elements from the daily examination of the patients and biological assessments carried out when necessary to confirm the presumptive diagnosis.

2.3. Sampling

We conducted a non-probability sampling of pregnant and parturient women undergoing cesarean section in the department and meeting the inclusion criteria defined above. The patients were divided into two groups:

Group 1: it consisted of women who underwent caesarean surgery and had post-operative complications during their stay in the department;

Group 2: it included women who had undergone cesarean surgery and who did not develop any post-operative complications.

2.4. Data Collection

Data were collected through the review of prenatal consultation records (PNC), obstetric evacuation forms, the interview of pregnant/parturient women on admission, their clinical examination during hospitalization to look for a postoperative complication and the interpretation of the results of the biological examination.

2.5. Variables

The variables studied were: sociodemographic (age, occupation, level of education and marital status), obstetric (parity, number of prenatal consultations, structure for carrying out prenatal consultations, qualification of the health worker who offered the prenatal consultations, state of the water bag as well as the duration of rupture of the water bag, the duration of labor, the type of cesarean section and the type of complications) and prognostic, evaluated according to the occurrence or not of maternal death at hospital discharge.

2.6. Data Entry and Analysis

The data were entered using Excel software from the Office 2016 package and analyzed using SPSS.26.0 software. The data analysis allowed us to calculate the odds ratio with a 95% confidence interval around it. The significance threshold was 5%, i.e. a p-value less than 0.05.

2.7. Ethical Considerations

Informed consent was obtained from participants, confidentiality and anonymity were maintained. The results obtained will be used only for scientific purposes.

2.8. Difficulties

The difficulties encountered were the very short hospital stay (average duration of 3 days) due to the limited number of places and the influx of obstetric evacuations in the department, because since 2005, it has been the only operational level III maternity hospital for the entire city of Conakry and

its surrounding prefectures.

3. Results

3.1. Frequency and Sociodemographic Characteristics

During the study, 854 patients were included in this work including 71 cases of post-cesarean complications or 8.31%. The average age of the women was 26.7 ± 5.93 years with extremes of 14 and 47 years. They were mainly housewives (41.3%), married (95.7%) and not in school (43.0%). (Table 1).

3.2. Obstetric Parameters

Obstetric evacuation was the most frequent mode of admission (41.8%), pauciparous women represented 50.6% of the sample, 38.4% of caesareans had not had any prenatal consultation. In 65.0% of cases, prenatal consultations were carried out by midwives. Emergency caesarean section was the most common (69.0%). Nearly 3 out of 10 women (27.9%) had ruptured their water bags before admission and the duration of labor was less than 24 hours in 62.6% of cases. (Table 2).

The most frequently recorded complications were anemia (53.5%), surgical site infection (26.8%) and postpartum hemorrhage (16.9%). (Table 3).

The postoperative maternal lethality rate was 0.7%.

3.3. Factors Associated with the Occurrence of Post-cesarean Complications

After the analysis, we find certain factors likely to be associated with the occurrence of post-cesarean complications. These are obstetric evacuation (OR=2.151; CI: 1.312-3.527), multiparity (OR=3.544; CI: 2.009-6.252), absence of CPN (OR=3.498; CI: 2.094-5.843), performance of prenatal monitoring in health centers (OR=3.316; CI: 1.440-7.635), emergency cesarean section (OR=2.619; CI: 1.353-5.067), qualification of the prenatal monitoring agent (OR=8.854; CI: 2.236-35.060) and prolonged labor (OR=2.057; CI: 1.261-3.353). (Table 4).

Table 1. Sociodemographic characteristics of patients.

| Sociodemographic characteristics | Staff | Percentage |
|----------------------------------|-------|------------|
| Age groups (year) | | |
| ≤ 18 | 57 | 6.7 |
| 19-24 | 271 | 31.7 |
| 25-34 | 422 | 49.4 |

| Sociodemographic characteristics | Staff | Percentage |
|------------------------------------|-------|------------|
| ≥ 35 | 104 | 12.2 |
| Average age: 26.7 ± 5.93 years | | |
| Occupation | | |
| Housewife | 353 | 41.3 |
| Student | 157 | 18.4 |
| Liberal | 281 | 32.9 |
| Employee | 63 | 7.4 |
| Marital status | | |
| Bride | 817 | 95.7 |
| Bachelor | 37 | 4.3 |
| Level of education | | |
| Not in school | 367 | 43.0 |
| Primary | 176 | 20.6 |
| Secondary | 227 | 26.6 |
| University | 84 | 9.8 |

Table 2. Obstetric characteristics of patients who underwent cesarean section.

| Obstetric parameters | Staff | Percentage |
|--|-------|------------|
| Admission mode | | |
| Evacuated | 357 | 41.8 |
| Coming by herself | 497 | 58.2 |
| Parity | | |
| Primiparous | 324 | 37.9 |
| Pauciparous | 432 | 50.6 |
| Multiparous | 98 | 11.5 |
| Number of PNC | | |
| 0 | 42 | 4.9 |
| 1-3 | 772 | 90.4 |
| ≥ 4 | 40 | 4.7 |
| PNC implementation structure (n=812) | | |
| Health center | 273 | 33.6 |
| MMC | 206 | 25.4 |
| UHC | 156 | 19.2 |
| Private Structure | 177 | 21.8 |
| Qualification of the agent who carried out the PNC (n=812) | | |

| Obstetric parameters | Staff | Percentage |
|---------------------------|-------|------------|
| Doctor | 274 | 33.7 |
| Midwife | 517 | 63.7 |
| Health technical agent | 21 | 2.6 |
| Type of cesarean section | | |
| Prophylactic | 265 | 31.0 |
| Emergency | 589 | 69.0 |
| State of the water pocket | | |
| Intact | 615 | 72.0 |
| Broken | 239 | 28.0 |
| Duration of water rupture | | |
| Less than 24 hours | 156 | 18.3 |
| Greater than 24 hours | 83 | 9.7 |
| Intact | 615 | 72.0 |
| Duration of labor | | |
| Less than 24 hours | 535 | 62.6 |
| Greater than 24 hours | 319 | 37.4 |

PNC: prenatal consultation; MMC: municipal medical center; UHC: university hospital center.

Table 3. Types of complications presented by patients.

| Types of complications | Staff (n=71) | Percentage |
|------------------------------|--------------|------------|
| Endometritis | 6 | 8.4 |
| Postpartum hemorrhage | 12 | 16.9 |
| Urinary tract infection | 3 | 4.2 |
| Acute intestinal obstruction | 1 | 1.4 |
| Anemia | 38 | 53.5 |
| Surgical site infection | 19 | 26.8 |
| Thrombophlebitis | 1 | 1.4 |
| Eclamptic coma | 3 | 4.2 |

3.4. Maternal Lethality

During the study period, we recorded 6 cases of postoperative maternal deaths out of 854 cesarean sections performed, i.e. a case fatality rate of 0.7%. These were mainly deaths occurring in cases of severe decompensated anemia, hemorrhagic shock and eclamptic coma.

Table 4. Distribution of patients according to factors likely to be associated with the occurrence of post-cesarean complications.

| Settings | Complications n =71 | | Without complications n =783 | | OR; CI: 95% | P-value |
|--------------------|---------------------|-------|------------------------------|------|--------------------|---------|
| | n | % | n | % | | |
| Age groups | | | | | | |
| ≤ 18 | 5 | 7.04 | 52 | 6.6 | 1,065[0,411-2,758] | 0.896 |
| 19-24 | 26 | 36.62 | 245 | 31.3 | 1,268[0,765-2,104] | 0.353 |
| 25-34 | 34 | 47.89 | 388 | 49.6 | 0.935[0.575-1.521] | 0.788 |
| ≥ 35 | 6 | 8.45 | 98 | 12.5 | 0.645[0.272-1.528] | 0.315 |
| Occupation | | | | | | |
| Housewife | 30 | 42.2 | 323 | 41.3 | 1,042[0,637-1,704] | 0.869 |
| Student | 19 | 26.8 | 138 | 17.6 | 1,707[0,978-2,979] | 0.057 |
| Liberal | 16 | 22.5 | 265 | 33.8 | 0.568[0.319-1.011] | 0.052 |
| Employee | 6 | 8.5 | 57 | 7.3 | 1,175[0,488-2,830] | 0.717 |
| Admission mode | | | | | | |
| Evacuated | 42 | 59.2 | 315 | 40.2 | 2,151[1,312-3,527] | 0.001 |
| Coming by herself | 29 | 40.8 | 468 | 59.8 | | |
| Level of education | | | | | | |
| Not in school | 38 | 53.5 | 329 | 42.0 | 1,589[0.975-2.587] | 0.060 |

| Settings | Complications n =71 | | Without complications n =783 | | OR; CI: 95% | P-value |
|--|---------------------|------|------------------------------|------|-----------------------|---------|
| Primary | 11 | 15.5 | 165 | 21.1 | 0.686[0.353-1.335] | 0.265 |
| Secondary | 15 | 21.1 | 212 | 27.1 | 0.721[0.399-1.303] | 0.277 |
| University | 7 | 9.9 | 77 | 9.8 | 1.002[0.443-2.265] | 0.994 |
| Parity | | | | | | |
| Primiparous | 18 | 25.3 | 306 | 39.1 | 0.529[0.304-0.920] | 0.022 |
| Pauciparous | 33 | 46.5 | 399 | 51.0 | 0.835[0.513-1.360] | 0.469 |
| Multiparous | 20 | 28.2 | 78 | 9.9 | 3,544[2,009-6,252] | 0.000 |
| Number of PNC | | | | | | |
| 0 | 24 | 33.8 | 18 | 2.3 | 21,702[11,012-42,769] | 0.000 |
| 1-3 | 43 | 60.6 | 729 | 93.1 | 0.113[0.065-0.197] | 0.000 |
| ≥ 4 | 4 | 5.6 | 36 | 4.6 | 1,238[0,428-3,585] | 0.692 |
| PNC implementation structure | | | | | | |
| Health center | 24 | 51.1 | 249 | 32.5 | 3,027[1,597-5,737] | 0.000 |
| MMC | 10 | 21.3 | 196 | 25.6 | 0.784[0.383-1.607] | 0.506 |
| UHC | 8 | 17.0 | 148 | 19.3 | 0.855[0.391-1.868] | 0.694 |
| Private structure | 5 | 10.6 | 172 | 22.5 | 0.410[0.159-1.053] | 0.056 |
| Qualification of the agent who carried out the PNC | | | | | | 0.031 |
| Doctor | 18 | 38.3 | 256 | 33.5 | 1,234[0,672-2,264] | 0.496 |
| Midwife | 23 | 48.9 | 494 | 64.6 | 0.525[0.291-0.949] | 0.030 |
| Health technical agent | 6 | 12.8 | 15 | 1.9 | 7,317[2,698-19,842] | 0.000 |
| Type of cesarean section | | | | | | 0.393 |
| Emergency | 60 | 84.5 | 529 | 67.6 | 2,619[1,353-5,067] | 0.003 |
| Prophylactic | 11 | 15.5 | 254 | 32.4 | | |
| State of the water pocket | | | | | | |
| Intact | 52 | 73.2 | 563 | 71.9 | 1,150[0.659-2.008] | 0.621 |
| Broken | 19 | 26.8 | 220 | 28.1 | 0.869[0.498-1.516] | |
| Water break time | | | | | | |
| Less than 24 hours | 12 | 16.9 | 144 | 18.4 | 0.910[0.476-1.737] | 0.775 |
| Greater than 24 hours | 7 | 9.9 | 76 | 9.7 | 1,017[0,450-2,299] | 0.966 |
| Intact | 52 | 73.2 | 563 | 71.9 | 1.062[0.614-1.838] | 0.827 |
| Duration of labor | | | | | | |
| Greater than 24 hours | 38 | 60.3 | 281 | 37.4 | 2,547[1,505-4,310] | 0.000 |
| Less than 24 hours | 25 | 39.7 | 471 | 62.6 | | |

PNC: prenatal consultation; MMC: municipal medical center; UHC: university hospital center; OR: odds ratio; CI: confidence interval.

4. Discussion

In this work, we attempted to identify the factors associated with post-cesarean maternal complications in the obstetrics-gynecology department of the Ignace Deen National Hospital over a period of 6 months. This work showed a frequency of post-cesarean complications of 8.31%. Anemia (53.5%), surgical site infection (26.8%) and postpartum hemorrhage (16.9%) were the most common complications. Factors likely to contribute to the occurrence of post-cesarean complications were obstetric evacuation, multiparity, failure to perform prenatal consultation, emergency cesarean section and prolonged labor.

In this series, we recorded a frequency of post-cesarean maternal complications of 8.31%. Tshimbundu Kayembe A et al. [16] reported in their work on maternal post-cesarean complications in the DRC a frequency of 22.47%. A post-cesarean complication rate of 27% was recorded in Finland in 2010 [17].

But this result is higher than that reported in the same department 14 years ago (2008) by BaldéIS et al. [18] or 7%. This disparity could be explained by the fact that since the closure of the maternity ward of the Donka national hospital in 2015 for the renovation of this hospital, the maternity ward of Ignace Deen has seen its activities doubled or even tripled from 3000 to 8000 deliveries per year and constitutes the only level III reference structure ensuring the management of the majority of obstetric emergencies coming from secondary and tertiary structures of the city of Conakry and its surroundings, thus increasing the cesarean rate as well as the risks of postoperative complications.

Anemia was the most frequently encountered postoperative complication in this series. An observation identical to ours was made in 2018 at the Gabriel Touré University Hospital in Bamako by Dembélé DD [19]. This observation could be explained by malnutrition, multiparity and closely spaced pregnancies responsible for chronic anemia on the one hand and on the other hand the occurrence of hemorrhages in per partum (retroplacental hematoma and placenta previa), during cesarean section and in the immediate postpartum period. This calls on all health workers involved in maternal health to ensure early detection and adequate management of anemia during pregnancy and strict monitoring of women in labor in the immediate postpartum period.

Surgical site infection was the most common post-cesarean infectious complication in this study. This frequency of post-operative infectious complications could be underestimated because of their somewhat late onset and the short stay of patients in the department, the average of which is 3 days, due to the influx of obstetric emergencies and the limited number of places. A predominance of surgical site infection in post-cesarean complications was reported by some authors [18, 20]. We agree with the conclusion of Tshimbundu Kayembe A et al. [16] who reported in their series a frequency of surgical site infection of 26.82%, ranking second among

post-cesarean complications.

This work shows that evacuated patients were more exposed to the occurrence of post-cesarean complications compared to those who came from home. This finding is consistent with those of DembéléDD et al. [18] and BaldéIS et al. [19] who found a statistically significant link between obstetric evacuation and the occurrence of post-cesarean complications. In the majority of cases, these were parturients evacuated from secondary structures where there were several hours or even days of unsuccessful attempts at vaginal delivery during which a problem arose, thus worsening the maternal prognosis.

The finding reveals that multiparous women were at greater risk of postoperative complications compared to other patients. An identical observation was reported by Tshimbundu Kayembe A in the DRC in 2024 [16] DRC. Our finding is consistent with that of TalléB et al. who found in their series a statistically significant link between the occurrence of post-cesarean complications and grand multiparity. Multiparity exposes parturients to postpartum complications (postpartum hemorrhage) because of the high risk of uterine atony in this group of parturients. For some authors, parity alone cannot be considered a risk factor for the occurrence of postoperative complications; it is the combination of several factors, namely age, obstetric evacuation and socioeconomic level [19].

In this series, it appears that parturients undergoing emergency cesarean sections were more exposed to the occurrence of postoperative complications compared to those undergoing prophylactic cesarean sections. An observation identical to ours was reported by Alemu et al. in Ethiopia mentioning that obstetric emergencies exposed to the occurrence of postoperative complications by almost 3 times [21]. This could be explained by the fact that emergency cesarean sections are most often performed on women in labor for several hours, or even days, evacuated from level 2 structures sometimes with their waters broken. Cesarean sections performed in this context could increase the risk of postoperative complications.

This work reveals that women who did not have prenatal consultations were more likely to have post-cesarean morbidity compared to other pregnant women. A statistically significant link between the absence of prenatal consultation and post-cesarean complications was reported by some authors [22, 23]. This result could be explained by the fact that the failure to carry out prenatal monitoring can lead to the absence of detection and management of certain maternal morbidities of pregnancy (anemia, pre-eclampsia, urinary tract infection, etc.) which could persist or even worsen in the postpartum period, thus increasing maternal morbidity and mortality rates.

Parturients with prolonged labor were more likely to have postoperative complications compared to other groups of parturients. Diallo MH et al. [24] reported in their work on cesarean section complications, a statistically significant

association between prolonged labor and the occurrence of postcesarean complications.

Compared to maternal lethality, it was 0.7% in this series. Higher post-cesarean lethality rates have been reported by some authors in Guinea and Senegal, varying between 1.25% and 3.45% [24-26]. This difference could be explained by the introduction of free obstetric and neonatal care and the improvement of the conditions for performing cesareans in our structure by the introduction of locoregional anesthesia and access to resuscitation facilities.

Conclusion: This work shows a significant frequency of post-cesarean complications. Anaemia, surgical site infection and postpartum haemorrhage were the most frequent complications. Factors likely to influence the occurrence of post-operative complications were obstetric evacuation, multiparity, absence of prenatal consultation, prenatal monitoring in health centres, emergency cesarean section, qualification of the prenatal monitoring provider (health technical agent) and prolonged labour.

Raising awareness of the importance of prenatal monitoring, performing prophylactic cesareans in the event of any absolute indication for cesarean section, limiting births, and good postpartum monitoring could reduce the risk of post-cesarean complications.

Abbreviations

| | |
|-----|----------------------------|
| CI | Confidence Interval |
| MMC | Municipal Medical Center |
| OR | Odds Ratio |
| PNC | Prenatal Consultation |
| UHC | University Hospital Center |

Author Contributions

Sow AII (design, data collection and analysis, and manuscript writing), Diallo FB (manuscript review), Diallo IT (Surgery), Baldé AD (surgery), Baldé BT (data collection), Diallo L (data collection), Keita M (data collection), Diallo A (manuscript revision), Baldé IS (manuscript revision), Sy T (manuscript revision).

Conflicts of Interest

The authors declare no conflict of interest related to this work.

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