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Study on the Quality of Cesarean Sections: Experience of the Saint-Louis Regional Hospital Center from January 1, 2022, to December 31, 2023

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Abstract

Objectives: The overall objective of this study was to evaluate cesarean sections performed at the maternity ward of the Saint-Louis Regional Hospital Center according to the ROBSON classification. **Methodology:** This was a retrospective cross-sectional study covering the period from January 1, 2022, to December 31, 2023. The study included all women who gave birth in the department during the study period. The sampling was exhaustive, covering all cases of cesarean sections performed during the study period. Data were collected from our continuous data recording database. Data were extracted from Falemaker pro using MS Excel 2019 in macro mode and then transferred to SPSS (Statistical Package for Social Sciences) software. Results: We recorded 3,476 cesarean sections out of 11,142 deliveries at the CHRSL, representing a relative frequency of 31%. The average age of patients was 27 years, with extremes of 12 and 52 years. The most represented age group was 20 - 35 years old. Nulliparous women accounted for 38.6% of cesarean sections. 73.7% of women in labor had undergone at least four prenatal care visits. Single pregnancies accounted for 95.96% of cesarean sections, followed by twin pregnancies, accounting for 3.92%. Cephalic presentation accounted for 91.89% of cesarean sections, followed by breech presentation, accounting for 7.47%. Patients with a history of cesarean section accounted for 37.6% of cesarean sections, and 75.28% of them had a single scarred uterus. Multiple scarred uteri accounted for 28.95% of the indications for cesarean sections. 63% of patients

received care within the first hour of admission. The average length of hospital stay was 3 days. We observed 4.82% of postoperative complications. During our study, we noted that Robson classification group 2 was the most represented, at 31.4%, followed by group 5, at 28.92%. 97.56% of newborns had an Apgar score greater than 7 at five minutes, and stillbirths accounted for 4%. We recorded 14 maternal deaths, representing a cesarean section mortality rate of 0.4%. **Conclusion:** The frequency of cesarean sections has continued to increase over the last few decades and is related to its indications, which differ from one place to another. Our study shows that cesarean section appears to reduce fetal and maternal morbidity and mortality, but it still carries risks of morbidity and mortality, especially in settings where women have limited access to quality obstetric care.

Keywords

Cesarean Section, Quality, Robson, Saint-Louis

1. Introduction

The frequency of cesarean section has continued to increase in recent decades and is related to its indications, which differ from one country to another and within the same country, from one medical institution to another [1]. Cesarean section is a surgical procedure that can effectively prevent maternal and neonatal mortality when performed for medical reasons. Globally, cesarean section rates have increased in recent decades. According to recent estimates from 150 countries, 21% of all births are by cesarean section, with the frequency varying from 1% to 58% depending on the country. The global cesarean section rate has nearly tripled in a quarter of a century, rising from 6.7% in 1990 to 19.1% in 2014, according to WHO estimates [2]. However, cesarean sections also carry risks for both mother and child, which are higher in settings where women have limited access to quality obstetric care. These risks include infection, thromboembolic diseases, and placental adhesion abnormalities [3] [4].

In Senegal, policies providing free C-sections were implemented nationwide in 2006, and the C-section rate rose from 4.2% in 2004 to 5% in 2010 [5] [6]. Far from the WHO range (10%) in 2015, free cesarean sections are one of the strategies for reducing maternal and neonatal mortality [7].

A high-quality cesarean section could be defined as a procedure that benefits all patients who truly need it, with minimal risk to the mother-child relationship and at an affordable cost to the patient and the healthcare system [8].

The classification proposed by Robson in 2001 allows women to be classified into 12 categories according to their characteristics and those of their pregnancy. Widely used, this classification offers multiple advantages such as simplicity, objectivity, and the identification of at-risk groups. However, it does not take into account, for example, the indications for a cesarean section or the patient's expe-

rience of a cesarean section in terms of postoperative pain [9].

In the absence of studies on the quality of cesarean sections in northern Senegal, we deemed it necessary to analyze the determinants of quality cesarean sections in terms of surgical indications and postoperative follow-up at the maternity ward of the Saint-Louis Regional Hospital Center (CHRSL) in Senegal, with the aim of formulating recommendations to improve the quality of cesarean sections and reduce maternal and perinatal morbidity and mortality. The overall objective was to evaluate cesarean sections performed at the CHRSL maternity ward according to the ROBSON classification. The objectives were to calculate the relative frequency of cesarean sections at the CHRSL maternity ward, identify the sociodemographic profile of patients, study clinical and obstetric characteristics, and identify the maternal-fetal prognosis.

2. Methodology

This was a retrospective cross-sectional study. It was conducted from January 1, 2022, to December 31, 2023, at the maternity ward of the Saint-Louis Regional Hospital Center in Senegal. It is located nearly 250 km to north. The study included all women in labor admitted to the department during the study period. This was an exhaustive sample covering all caesarean sections performed during the study period. We included all records of patients who underwent caesarean sections during the study period at the CHRSL and excluded records of caesarean sections with incomplete information. The data were collected from our continuous data recording database. The data were extracted from Falemaker pro using MS Excel 2019 software in macro mode and then transferred to SPSS (Statistical Package for Social Sciences) software for analysis. Quantitative variables, means surrounded by their standard deviation, median, and extremes, were calculated. For qualitative variables, we established percentages. We studied sociodemographic characteristics, indications for cesarean sections, duration, and the future of the mother-child couple.

3. Results

3.1. Relative Frequency of Cesarean Sections

During our study period, we recorded 3,465 cesarean sections out of 11,142 deliveries at the CHRSL, representing a relative frequency of 31%. Cesarean sections were performed on an emergency basis in 69% of patients.

3.2. Sociodemographic Characteristics

The average age of patients was 27, ranging from 12 to 52. Patients aged 20 - 35 were overrepresented, as shown in **Figure 1**. The average parity was 2, ranging from 1 to 10. Multiparous women accounted for 42% of patients. The average parity was 2, ranging from 0 to 10. Nulliparous women accounted for 38.6% of cesarean sections.

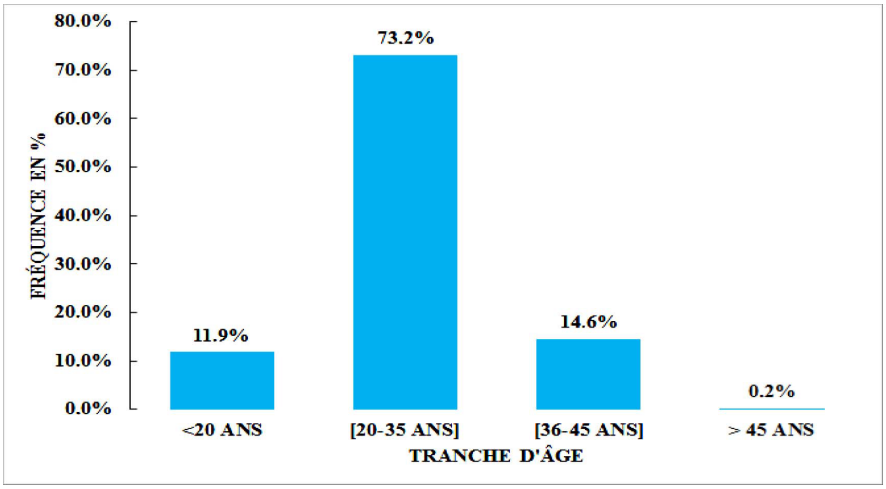

Figure 1. Distribution of patients who underwent a cesarean section at the maternity ward of the Saint-Louis Regional Hospital Center by age group, from January 1, 2022, to December 31, 2023.

3.3. Clinical Aspects

Nearly three-quarters of the women in labor had undergone at least four antenatal care visits, as shown in the histogram (Figure 2).

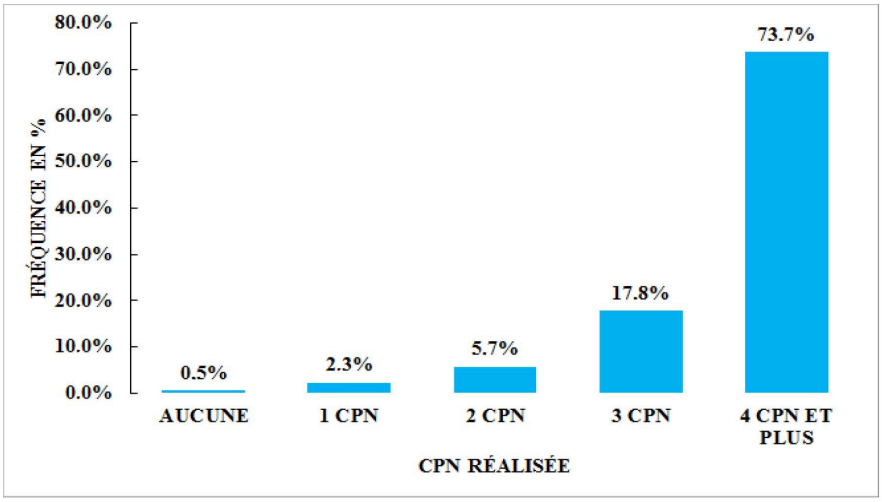

Figure 2. Distribution of patients who underwent a cesarean section at the Saint-Louis Regional Hospital Center maternity ward according to the number of antenatal care visits, from January 1, 2022, to December 31, 2023.

Nearly two out of three patients were admitted in labor, or 63.17%. They were fully dilated in 20% of cesarean sections. Single pregnancies accounted for 95.96% of cesarean sections, followed by twin pregnancies, or 3.92%. Thirty-three percent (33.71%) of singleton pregnancies were associated with a scarred uterus. The most common presentation was vertex, accounting for 91.89%. Breech presentation accounted for 7.47% of cesarean sections.

A previous cesarean section was found in 1,521 of our patients, or 44%. Patients

with a single scar uterus accounted for 75.28% of cesarean sections, followed by those with two scars, accounting for 18.54%.

3.4. Indications for Cesarean Section According to the Robson Classification

During our study, we noted that group 2 was the most represented, at 31.4%, followed by group 5, at 28.92% (Figure 3).

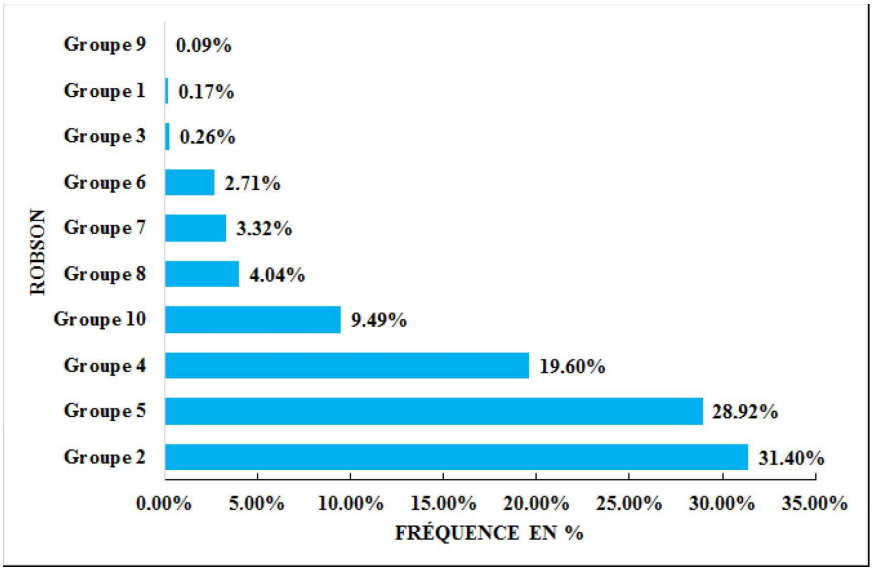

Figure 3. Distribution of patients who underwent cesarean sections at the maternity ward of the Saint-Louis Regional Hospital Center according to the ROBSON group, from January 1, 2022, to December 31, 2023.

3.5. Maternal Prognosis

During our study, 4.8% of patients experienced complications. The table summarizes the complications found. Infectious complications were the most common, namely parietal suppuration and endometritis, which accounted for 52.1% and 16.17% of cases, respectively.

Table 1. Distribution according to types of postoperative complications.

Type of complication	Number	Percentage
Endometritis	27	16.17
Parietal suppuration	87	52.1
Hemorrhagic complications	53	31.73
Total	167	100

With regard to maternal mortality, we recorded 14 deaths, representing a cesarean section mortality rate of 0.4%. Twelve of the deaths occurred in the postoperative period (intensive care or maternity ward) and two in the operating room.

3.6. Neonatal Prognosis

Among the caesarean section cases, we recorded 3,609 newborns, including 3,325 from single pregnancies, 272 from twin pregnancies, and 12 from quadruplet pregnancies. The Apgar score at one and five minutes was 93.36% and 97.56% above 7, respectively. Stillbirths accounted for 4% of newborns delivered by cesarean section. The stillbirth rate was 4%.

3.7. Quality of Care

The distribution of cesarean sections according to the time of care is shown in Table 2.

Table 2. Distribution according to time to care.

Time to delivery	Number	Percentage
Less than or equal to 1 hour	2,184	63
More than 1 hour	1281	37
Total	3465	100%

The time taken to perform cesarean sections was less than one hour in 63% of cases (Table 2).

The distribution of cesarean sections according to length of stay in the CHRSL maternity ward is shown in Table 3.

Table 3. Distribution according to length of hospital stay.

Number of days of hospitalization	Number	Percentage
2 days	1,459	42.1
3 days	1498	43.2
4 days	330	9.5
5 days	92	2.7
> 5 days	146	4.2
Total	3,465	%

The average length of hospital stay was approximately 3 days. Most women stayed in hospital for 2 or 3 days, representing 42.1% and 43.2% respectively (Table 3).

3.8. Quality of Care

In assessing the quality of care, certain variables were selected. These concerned the time taken to provide care, the availability of the operating theater and staff, the quality of the anesthetist and surgeon, the completion of the pre- and postoperative checklists, and compliance with postoperative monitoring instructions. The table shows the variables found. In terms of treatment time, nearly 63% of patients were treated within an acceptable time frame, and staff were available for the procedure in 100% of cases (Table 4). However, the checklist was completed in full in 60% of cases.

Table 4. Distribution according to the quality of care conditions.

Variables	Quality		Non-quality		Total
	Number	%	Number	%	
Time taken to provide care	2183	63	1282	0	3465
Kit availability	3465	100	0	0	3465
Staff availability	3465	100	0	0	3465
Operating room availability	3465	100	0	0	3465
Operator quality	3465	100	0	0	3465
Quality of the anesthesiologist	3465	100	0	0	3465
Operating instructions	3271	94.4	194	5.6	3465
Intraoperative complications	3412	98.5	53	1.5	3465
Compliance with the checklist	2079	60	1386	40	3465
Immediate postoperative monitoring	3465	100	0	0	3465
Postoperative complication	3298	95.18	167	4.82	3465
Average length of hospital stay	3319	95.79	146	4.21	3465
Availability of surgical protocol after cesarean section	3645	10	0	0	3465

4. Discussion

Limitation of the study, as this is a retrospective study, we are faced with frequent data gaps due to the quality of medical record keeping.

During our study, we recorded 3,465 cesarean sections and 11,142 deliveries, representing 31%. This frequency is twice as high as that set by the WHO (10 to 15%). However, this relative frequency is similar to that observed by Cissé *et al*. in 2004 (25.2%) at the Dakar University Hospital [10] [18], Niang M *et al*. in 2011 (27.1%) at the Dakar University Hospital [11], and Tamboura in 2012 (31.1%) in Bamako [12].

In our series, the extreme ages ranged from 12 to 52 years. The most represented age group was 20 - 35 years, accounting for 73.3%. These data are corroborated by the results of studies by Traoré M [5] (53%) and Kane F [13] (84.47%).

In our series, 73.7% of patients received at least four prenatal checkups, and only 0.5% of patients who underwent surgery had not received any prenatal checkups. This prenatal care led to the referral of 15% of patients. These results are similar to those found in Ouagadougou (13%) [14] and significantly lower than those of Cissé *et al* in Senegal (28%) [10]. These results highlight the poor quality of CPNs in the fight against maternal and fetal mortality and morbidity.

The Robson classification of cesarean sections found a predominance of group 2b (nulliparous women at term with a cephalic presentation fetus who underwent cesarean section before labor), with 31.4% of indications. In a study conducted in Switzerland in 2017, Haydar *et al*. found a similar result, namely 35% [15].

In terms of maternal morbidity, we recorded 167 cases of postoperative complications, or 4.82%. These results are lower than the data in the African literature. Yacouba *et al*. [16] and Cissé [10] found 7.06% and 5%, respectively.

The maternal mortality rate after cesarean section was 0.4% in our series. Benkirane in Morocco [17] and in Senegal [10] reported rates of 0.44% and 0.34%,

respectively. However, Ouedraogo (2.3%) [8], Cissé (3%) [10], and Kinenkinda (1.4%) [1] found relatively higher rates of 2.3%, 3%, and 1.4%, respectively.

In the assessment of the quality of care, 63% of patients were treated within a reasonable time frame. Staff were available in 100% of cases, as was blood.

We also observed 100% availability of nursing staff, 100% availability of the operating room and surgical kit, and finally 100% availability of blood. In the literature, the results reported by Togora M. [18] show 91.1% of cases treated within less than 1 hour, 100% availability of cesarean section kits, 95.2% availability of nursing staff, 96% availability of operating rooms, and 84.1% availability of blood.

5. Conclusion

The results of our study show that the frequency of cesarean sections is relatively high. Maternal and neonatal mortality and morbidity are relatively low. The quality of care is good. Thus, the maternity ward at the Saint-Louis Regional Hospital plays an important role in reducing maternal mortality and morbidity.

Conflicts of Interest

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

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