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Research Article

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Indications and Maternal and Neonatal Outcomes of Prelabor Cesarean Deliveries at the Pikine National Hospital Center, Dakar, Senegal

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ABSTRACT

Background: Cesarean delivery performed before the onset of labor may be either planned or undertaken as an emergency procedure in response to maternal, fetal, or obstetric conditions requiring delivery before labor begins. This study aimed to describe the frequency, indications, and maternal and neonatal outcomes of prelabor cesarean deliveries at the Pikine National Hospital Center, Dakar, Senegal.

Methods: This retrospective descriptive study was conducted at the maternity unit of the Pikine National Hospital Center over a period of five years and four months, from January 2018 to April 2023. The study included 5,187 women who underwent cesarean delivery before the onset of labor. Women who underwent cesarean delivery after labor had begun were excluded. Sociodemographic, obstetric, maternal, and neonatal characteristics were analyzed using SPSS version 20.0.

Results: During the study period, 22,492 deliveries and 8,674 cesarean deliveries were recorded. Of these, 5,187 were performed before the onset of labor, accounting for 23.1% of all deliveries and 59.8% of cesarean deliveries. Mean maternal age was 29.4 years; 40.3% had a previous cesarean delivery. Delivery before 37 weeks of gestation accounted for 62.1% of cases. The main indications were a scarred uterus (40.0%), hypertensive disorders of pregnancy and their complications (21.1%), and maternal medical conditions (9.1%). Postoperative maternal complications occurred in 0.4% of patients. Live births accounted for 94.4% of all births, while neonatal deaths after live birth represented 2.8% of all births. A five-minute Apgar score ≥ 7 was recorded in 81.7% of cases.

Conclusion: Prelabor cesarean deliveries represented a substantial proportion of obstetric activity at the Pikine National Hospital Center. A scarred uterus and hypertensive disorders of pregnancy were the leading indications. Regular assessment of cesarean indications and improved documentation are important for evaluating obstetric practice.

Keywords: Cesarean Delivery, Prelabor Cesarean Delivery, Indications, Scarred Uterus, Maternal Outcomes, Neonatal Outcomes, Pikine, Senegal.

Introduction

Cesarean delivery is a major obstetric procedure that contributes to reducing maternal and perinatal morbidity and mortality when performed for appropriate indications. Over recent decades, the expansion of indications for cesarean delivery, together with improvements in surgical techniques and

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perioperative care, has been accompanied by an increase in its frequency. The appropriate use of cesarean delivery therefore remains a major concern in maternal and perinatal healthcare [1–3].

The World Health Organization (WHO) has proposed the Robson classification as an international reference system for assessing and comparing cesarean delivery rates.

In Senegal, cesarean delivery is an essential component of comprehensive emergency obstetric and newborn care, particularly in referral healthcare facilities [4].

Some cesarean deliveries are performed before the onset of labor. These include both planned procedures and emergency interventions undertaken in response to maternal, fetal, or obstetric conditions requiring delivery before labor begins.

In this context, the present study aimed to describe the practice of prelabor cesarean delivery at the Pikine National Hospital Center in Dakar, Senegal, by determining its frequency and main indications and describing maternal and neonatal outcomes.

Materials and Methods

Study Design, Setting, and Period

This was a retrospective descriptive study conducted at the maternity unit of the Pikine National Hospital Center (CHNP) in Dakar, Senegal, over a period of five years and four months, from January 2018 to April 2023.

The Department of Obstetrics and Gynecology at CHNP is a referral facility equipped with a maternity unit and an operating theater for the management of obstetric emergencies, with dedicated medical and paramedical staff.

Study Population

The study included all women who underwent cesarean delivery before the onset of labor during the study period. Women who underwent cesarean delivery after the onset of labor were excluded. A total of 5,187 women were included.

Study Variables and Data Analysis

The variables studied included maternal age, gravidity, parity, gestational age, mode of admission, membrane status, fetal status at admission, associated maternal medical conditions, indications for cesarean delivery, maternal complications, five-minute Apgar score, and neonatal characteristics.

Data were entered and analyzed using SPSS software, version 20.0. Given the descriptive nature of the study, results were presented as absolute frequencies and proportions. For selected quantitative variables, means and ranges were reported.

Ethical Considerations

The study was conducted in accordance with ethical principles applicable to medical research. Patient confidentiality was respected throughout data collection and analysis. The information collected was used exclusively for research purposes, with due regard for the protection of patients' personal information.

Results

Frequency and Maternal Characteristics

During the study period, 22,492 deliveries were recorded at the Pikine National Hospital Center, including 8,674 cesarean deliveries. Among these, 5,187 were performed before the onset of labor, accounting for 23.1% of all deliveries and 59.8% of all cesarean deliveries.

The mean maternal age was 29.4 years, ranging from 12 to 49 years. Women aged 25–34 years represented 50.1% of the study population, and 97.6% were married. Mean gravidity was 2.5 (range: 1–12) and mean parity was 1.9 (range: 0–11). Pauciparous women accounted for 36.5% of patients; 40.3% had a history of cesarean delivery.

Prelabor cesarean deliveries performed before 37 weeks of gestation accounted for 62.1% of cases, while 33.7% were performed at term and 4.2% at or beyond 41 weeks of gestation. At least four antenatal care visits had been completed by 66.5% of women, and 94.2% had singleton pregnancies.

Table 1: Main maternal and obstetric characteristics

Characteristics	Results
Mean maternal age, years (range)	29.4 (12–49)
Age 25–34 years	50.1%
Married	97.6%
Mean gravidity (range)	2.5 (1–12)
Mean parity (range)	1.9 (0–11)
Nulliparous	20.7%
Primiparous	27.3%
Pauciparous	36.5%
Multiparous	15.5%
Previous cesarean delivery	40.3%
Delivery before 37 weeks	62.1%
Delivery at term	33.7%
Delivery at ≥ 41 weeks	4.2%
≥ 4 antenatal visits	66.5%
Singleton pregnancy	94.2%

Indications for Prelabor Cesarean Delivery

A scarred uterus was the leading indication for prelabor cesarean delivery, accounting for 40.0% of cases, followed by hypertensive disorders of pregnancy and their complications (21.1%) and maternal medical conditions (9.1%). The indication for cesarean delivery was not specified in 11.0% of cases.

Table 2: Indications for prelabor cesarean delivery (N = 5,187)

Indications	Number (n)	Percentage (%)
Scarred uterus	2,075	40.0

Hypertensive disorders of pregnancy and related complications	1,095	21.1
Maternal medical conditions	470	9.1
Post-term pregnancy	234	4.5
Malpresentation	225	4.3
Pelvic abnormalities	171	3.3
Fetal and adnexal conditions	165	3.2
Multiple pregnancy	95	1.8
Antepartum hemorrhage	51	1.0
Cesarean delivery on maternal request	28	0.5
Unspecified indications	574	11.0
Total	**5,187**	**100.0**

Maternal medical conditions included heart disease, uncontrolled diabetes mellitus, endocrine disorders, systemic diseases, chronic kidney disease, and cancer. Fetal and adnexal conditions included placenta previa, fetal macrosomia, severe intrauterine growth restriction, and nuchal cord. Four cases initially listed as "other indications" were excluded from the table because they had already been counted in other categories.

Maternal and Neonatal Outcomes

Maternal Outcomes

Postoperative maternal complications were recorded in 23 patients (0.4%). The most frequently reported complication was postpartum hemorrhage due to uterine atony, observed in 17 patients. Other complications included surgical wound infection in two patients, broad ligament hematoma in one, postpartum endometritis in one, venous thrombosis in one, and deep surgical site infection associated with a retained surgical sponge in one.

Table 3: Postoperative maternal complications

Complication	Number (n)
Postpartum hemorrhage due to uterine atony	17
Surgical wound infection	2
Broad ligament hematoma	1
Postpartum endometritis	1
Venous thrombosis	1
Deep surgical site infection associated with a retained surgical sponge	1
Total	23
Pauciparous	36.5%

Neonatal Outcomes

Live births accounted for 94.4% of all births, while fresh stillbirths and macerated stillbirths represented 4.2% and 1.4%, respectively. Neonatal deaths occurring after live birth accounted for 2.8% of all births. A five-minute Apgar score of 7 or higher was recorded in 81.7% of cases.

Regarding birth weight, 29.8% of newborns weighed less than 2,500 g, 65.5% weighed between 2,500 and 4,000 g, and 3.2% weighed more than 4,000 g. Birth weight data were missing in 1.5% of cases.

Table 4: Neonatal outcomes following prelabor cesarean delivery

Characteristics	Results
Mean maternal age, years (range)	29.4 (12–49)
Age 25–34 years	50.1%
Married	97.6%
Mean gravidity (range)	2.5 (1–12)
Mean parity (range)	1.9 (0–11)
Nulliparous	20.7%
Primiparous	27.3%
Pauciparous	36.5%
Multiparous	15.5%

Discussion

Prelabor cesarean delivery represented a substantial proportion of obstetric activity at the Pikine National Hospital Center, accounting for 23.1% of all deliveries and 59.8% of all cesarean deliveries during the study period. These findings should be interpreted in the context of a referral hospital managing complicated pregnancies and obstetric emergencies. Comparisons with other studies remain challenging because relatively few investigations have specifically examined cesarean deliveries performed before the onset of labor.

Indications for Prelabor Cesarean Delivery

A scarred uterus was the leading indication, accounting for 40.0% of cases. This finding is consistent with the high proportion of women with a history of cesarean delivery in our study population (40.3%). Hypertensive disorders of pregnancy and their complications represented the second most frequent indication (21.1%). These conditions constitute an important component of obstetric morbidity and may require delivery before spontaneous labor begins. Maternal medical conditions accounted for 9.1% of indications. The indication was not specified in 11.0% of cases, emphasizing the importance of improved documentation.

Gestational Age at Cesarean Delivery

In our study, 62.1% of prelabor cesarean deliveries were performed before 37 weeks of gestation. This proportion should be interpreted in the context of maternal, fetal, and obstetric conditions that may require delivery before labor begins. However, given the descriptive nature of the study, no causal relationship can be established between the indications for cesarean delivery and gestational age at delivery.

Maternal Outcomes

Postoperative maternal complications occurred in 0.4% of patients. Postpartum hemorrhage due to uterine atony was the most frequently reported complication, followed by surgical site

infections and other less frequent postoperative complications. Although the recorded complication rate was low, this finding should be interpreted cautiously given the retrospective design of the study.

Neonatal Outcomes

Live births accounted for 94.4% of all births, while neonatal deaths after live birth represented 2.8% of all births. A five-minute Apgar score of 7 or higher was recorded in 81.7% of cases. Low birth weight (< 2,500 g) was observed in 29.8% of newborns. These findings should be considered alongside the substantial proportion of prelabor cesarean deliveries performed before 37 weeks of gestation (62.1%). Nevertheless, the study did not include an analytical assessment of the relationship between gestational age and neonatal outcomes, and no statistical or causal association can be established.

Implications for Clinical Practice

The findings highlight the importance of regularly assessing the indications for prelabor cesarean delivery in referral maternity units. Systematic documentation of surgical indications should be encouraged to improve the evaluation of obstetric practices and the quality of medical records. A clear distinction between planned and emergency prelabor cesarean deliveries would facilitate a more accurate assessment of indications and maternal and neonatal outcomes. Coordination between obstetricians, anesthesiologists, and neonatologists remains essential, particularly in complicated pregnancies.

Implications for Future Research

Further prospective studies are needed to better characterize the indications and outcomes of prelabor cesarean delivery. Analytical studies could help identify factors associated with maternal and neonatal complications and assess the relationship between indications, gestational age, and neonatal outcomes. Multicenter studies involving different levels of healthcare facilities would provide a broader understanding of prelabor cesarean delivery practices in Senegal. Standardized classification systems, particularly the Robson classification, could facilitate comparisons between institutions [5,6].

Study Limitations

This study had several limitations. First, its retrospective design relied on information recorded in medical records, which may have affected data completeness. Second, the indication for cesarean delivery was not specified in 11.0% of cases. Third, some neonatal data were missing, including birth weight in 1.5% of cases. Finally, the descriptive nature of the study did not allow the identification of factors associated with maternal or neonatal complications or the establishment of causal relationships. Despite these limitations, this study provides useful descriptive data from a referral hospital in Dakar.

Conclusion

Prelabor cesarean delivery represented a substantial proportion of obstetric activity at the Pikine National Hospital Center, accounting for 23.1% of all deliveries and 59.8% of all cesarean deliveries. A scarred uterus was the leading indication (40.0%), followed by hypertensive disorders of pregnancy and their complications (21.1%). Furthermore, 62.1% of prelabor cesarean deliveries were performed before 37 weeks of gestation [7,8].

Postoperative maternal complications were recorded in 0.4% of patients. Live births accounted for 94.4% of all births, while neonatal deaths after live birth represented 2.8% of all births [9].

These findings highlight the importance of regularly assessing surgical indications, improving the documentation of obstetric practices, and strengthening multidisciplinary maternal and neonatal care. Further prospective and multicenter studies are needed to better evaluate factors associated with maternal and neonatal outcomes following prelabor cesarean delivery [10-12].

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