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Emergency Obstetric and Neonatal Care (EmONC) in Rural Senegal

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Abstract

Objectives: The aim of our study was to evaluate the emergency obstetric care in a maternity peripheral and analyze trends evolving in order to offer solutions to improve the quality of care. **Material and Methods:** Our study was part of the Centre Regional Hospital of Saint-Louis, located at 270 km from Dakar in the region of Saint Louis in northern Senegal. This was a retrospective longitudinal descriptive study from 1 January 2011 to 31 December 2024, a period of 15 years. It took into account all patients who underwent surgical or obstetrical procedure performed as an emergency. **Results:** We recorded 67,996 deliveries with a monthly average of 4533. Stillbirth decreased by 43%. The number of cesarean deliveries was 15,633 with a rate of 23%, dominated by caesarean compulsory in 60% of care in 33% and 7% in need. Evacuations represented 23% of obstetric admissions. We identified 302 cases of maternal deaths or 20 cases per year. The maternal mortality rate was 503 for 100,000 Live Births. 78% of cases were direct causes and 22% were indirect. **Conclusion:** The results of this study confirm a fact: the regional hospital Saint-Louis of its geographical position is a reference center in the north of Senegal device. EmONC's availability has improved indicators in maternal and newborn health in the area. So, it is important to emphasize the need for decentralization of obstetric-surgical periphery.

Keywords

Emergency Obstetric Care, Maternal and Fetal Mortality

1. Introduction

Maternal mortality is a major public health problem worldwide. For example, the World Health Organization (WHO) estimated that around 830 women died every day worldwide from complications related to pregnancy or childbirth, totalling 295,000 maternal deaths in 2017 [1]. Most of these deaths (99%) occurred in low-income countries, and most were preventable [2] [3].

Obstetric emergencies are care given to pregnant women, the fetus or the newborn requiring immediate care and available 24 hours a day.

Sub-Saharan Africa was the hardest hit, with mortality rates averaging 564 per 100,000 live births, compared with 183 in North Africa, 480 in East Africa, 509 in Central Africa and 339 in Southern Africa [4]. In Senegal, major efforts have reduced maternal mortality from 512/100,000 Live Births in 1992 to 216/100,000 Live Births by 2024 [5] [6]. Several strategies have been proposed to reduce this high mortality rate in developing countries, among which Emergency Obstetric and Neonatal Care (EmONC) occupies an essential place [4]. The impact of the quality of EmONC on mortality and stillbirth has led to this activity being closely monitored by healthcare providers and public authorities. The aim of our work was to evaluate emergency obstetric care in a peripheral maternity hospital and analyze trends and propose solutions to improve the quality of care.

2. Material and Methods

Maternal mortality is a major public health problem worldwide. For example, the World Health Organization (WHO) estimated that around 830 women died every day worldwide from complications related to pregnancy or childbirth, totalling 295,000 maternal deaths in 2017 [1]. Most of these deaths (99%) occurred in low-income countries, and most were preventable [2] [3].

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We included the files of patients treated in the maternity ward. Files with missing or insufficiently completed data were excluded. For each quantitative variable, we calculated the position and dispersion parameters. For the qualitative varia-

bles, the relative and absolute frequencies were calculated using the JAMOVI software.

3. Results

3.1. Deliveries

With a total of 67,996 deliveries recorded during the study period, the annual average was 4533. We noted an evolving trend in the number of caesarean sections and vacuum deliveries since 2019 (Figure 1).

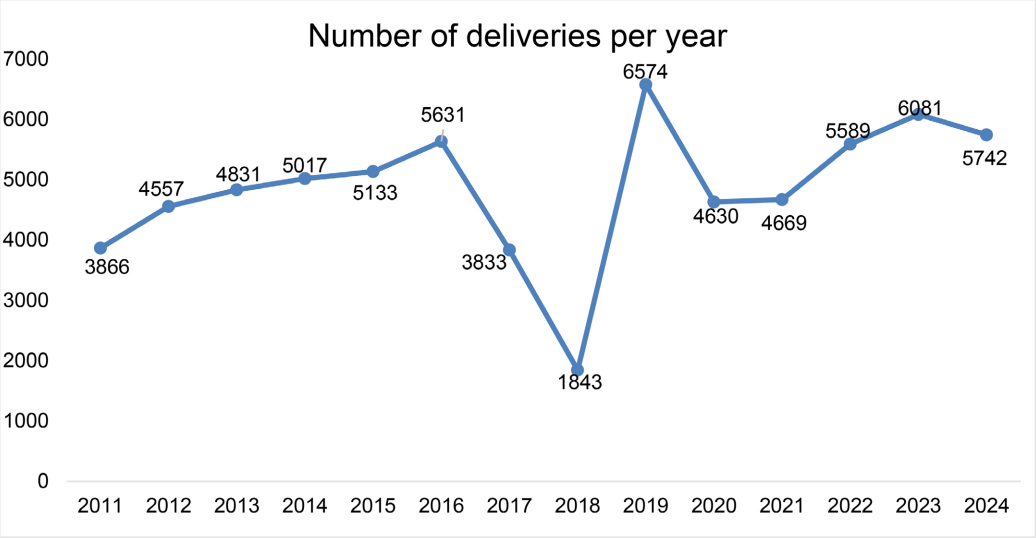

Figure 1. Evolution of the number of deliveries from 2011 to 2024.

3.2. Births and Stillbirths

Since 2006, we have observed a clear decrease in stillbirths and an increase in live births and deliveries since 2014 (Figure 2 and Figure 3).

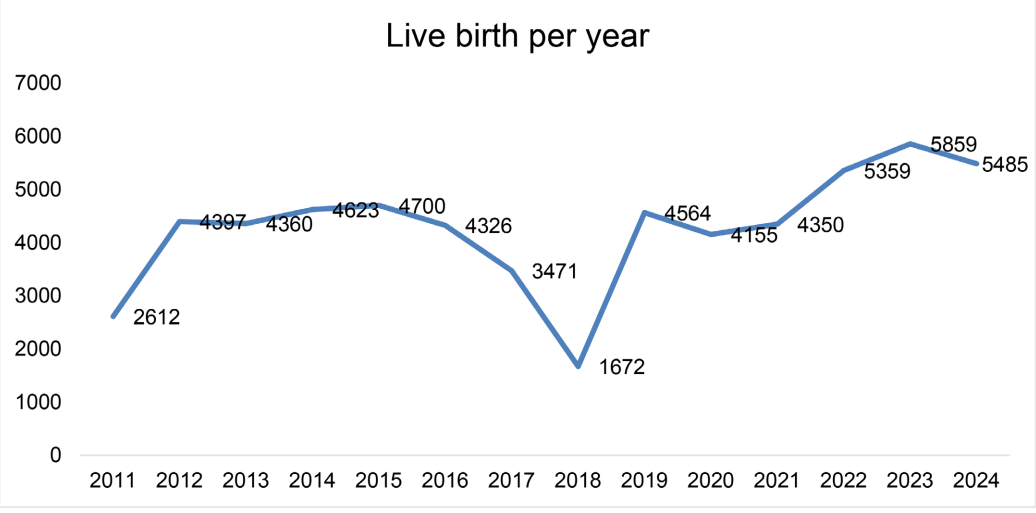

Figure 2. Evolution of the number of live births.

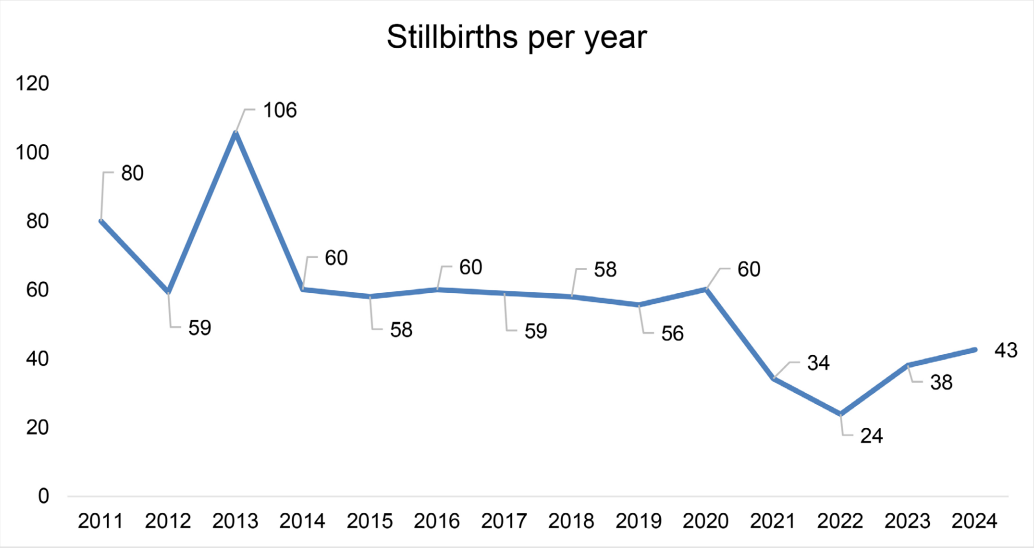

Figure 3. Evolution of stillbirth.

3.3. Caesarean Sections

During the 15 years, 15,633 cesarean sections were performed, giving a rate of 23%. The number of C-sections was stable between 2011 and 2019, ranging from 17% to 20%. From 2020 onwards, the number rose sharply until 2024. Indications for caesarean sections were dominated by compulsory caesarean sections (60%), followed by precautionary caesarean sections (33%) and necessity caesarean sections (7%).

3.4. Evacuations

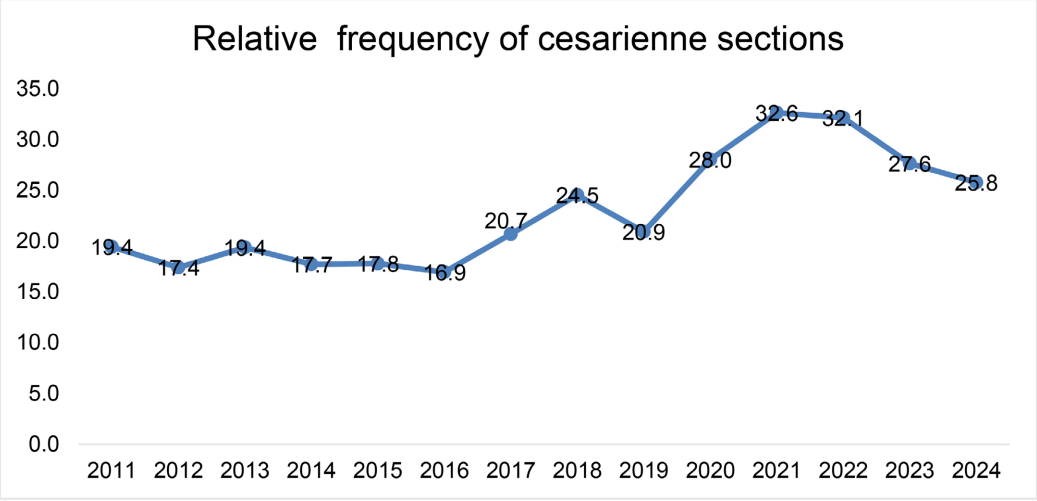

Figure 4. Evolution of the relative frequency of cesarean section.

Evacuations numbered 15,963 over the 15-year period, representing almost 23% of obstetric admissions. The annual average was 1140, most of them from the Saint-Louis districts. Most came from health posts (55.9%). These health posts were lo-

cated in the Saint-Louis health district in 79% of cases. In 77.6% of cases, information on the time of the decision to evacuate, the time of departure from the facility and the time of arrival was not provided. Obstetric medical evacuation was decided by a midwife in 98.4% of cases. Evacuees were transported by ambulance in 52.1% of cases, accompanied by medical staff in 52.7% of cases, and had a venous line on admission in 55.4% of cases. We noted a gradual increase in the number of evacuations, from 786 in 2011 to 1718 in 2024, *i.e.* more than a 2-fold increase. Of the patients evacuated, 25.4% had undergone an emergency caesarean section, and a haemostasis hysterectomy was performed on 27 patients (0.4%). Maternal and neonatal mortality were 0.6% and 9.9% respectively (**Figure 4**).

3.5. Pathologies and Maternal Mortality

We noted 302 cases of maternal death, *i.e.* 503 per 100,000 Live Births, with 204 cases of direct obstetric causes, *i.e.* 78%. Post-partum hemorrhage was the leading cause of death with 25 cases (21%), followed by eclampsia with 17 cases (14%). Pre-eclampsia was implicated in 13 deaths (12%). Uterine rupture was the cause of maternal death in 4 cases (3%). Ectopic pregnancy was found in 2 cases. Placenta previa was responsible for death in 4 cases. Indirect causes were responsible for 98 cases of death (22%). These were anemia in 10 cases (10%), heart disease in 12 cases (12%), malaria and pregnancy in 6 cases (6%) and other morbid associations (diabetes and pregnancy: 6 cases, infection: 5 cases) in 9 cases (9%) (**Table 1**).

Table 1. Distribution of obstetric pathologies and lethality in the maternity ward of the Regional Hospital of Saint-Louis from 2011 to 2024.

Obstetric pathologies	Total number	Number of deaths	Lethality in %
Abortion	5661	6	0.1
Ectopic pregnancy	628	2	0.3
Placenta previa	692	4	0.8
Retroplacental hematoma	512	29	5
Uterine rupture	258	36	14
Post-partum hemorrhage	1304	61	4
Infections	69	5	8.69
Pre-eclampsia	4742	22	7
Eclampsia	780	38	5
Anemia and pregnancy	3385	10	0.3
Diabetes and pregnancy	3652	5	0.1
Malaria and pregnancy	185	6	3
Heart disorder	32	12	36
Other pathologies	1068	66	6

4. Discussion

The study enabled us to draw up an overall assessment of obstetrical activities and

their evolutionary trends. Since the availability of 24-hour EmONCs in 2009, the maternity team has had to cope with an increase in obstetric activity. The number of deliveries has almost doubled, the number of caesarean sections has increased (n = 315), and the annual average of evacuations received at the facility has multiplied by 2 (n = 564). Mbaye *et al.* [6] and Moreau *et al.* [7], in two studies carried out in Rufisque, highlighted the need for EmONC availability.

Service utilization indicators were improved. The caesarean section rate as a proportion of deliveries rose from 19 to 25%. Analysis of the caesarean section rate shows that surgical activity occupies an important place in the department. This is explained by the geographical position of the Regional Hospital of Saint-Louis, which covers 4 departments where BEmONC is available, and by the fact that most of the cases referred to this center are serious cases that often require obstetric-surgical intervention. Nevertheless, our caesarean section rate far exceeds that recommended by the WHO [8], which is 5 to 15%, and remains very high compared with those found in certain African countries [6] [9] [10].

In view of the poorly controlled trend in Caesarean section rates, we agree with Boisselier [11] that the best approach is to classify indications into three groups:

- **Compulsory Caesarean Section:** This concerns situations where delivery can only be achieved by the high route: fetopelvic disproportions, placenta previa, abnormal presentations, and uterine rupture.
- **Precautionary Caesarean Section:** This corresponds to circumstances in which an intervention is certainly not essential, but can in such cases provide a better maternal and above all, fetal prognosis: scarred uterus, breech presentation, fetal distress, precious child.
- **Necessary Caesarean Section:** This is performed for pathologies that are generally accessible to preventive medical treatment, but which, if not monitored or managed during pregnancy or delivery, may have an unfavourable evolution and lead to emergency surgery: dynamic dystocia, arterial hypertension or other maternal pathologies.

From this point onwards, it's easy to understand why the necessity of Caesarean section rates must be reduced by close monitoring of high-risk pregnancy and delivery in a referral center.

The maternal mortality rate recorded (503/100,000 Live Births) seems to us to be even higher than the figure recorded at national level (216/100,000 Live Births) [1]. The same is true of hospital figures [1] [9] [10]. Causes of death are dominated by haemorrhage, followed by paroxysmal complications of hypertension (pre-eclampsia, eclampsia). These data are comparable to those found in African literature [1] [9]-[11]. In our setting, blood and blood derivatives are rarely available on an emergency basis, which explains the high number of deaths caused by haemorrhage.

Stillbirths are also a very useful factor for monitoring obstetrical activity. The rate has fallen from 80 per 1000 to 43 per 1000, which is comparable to some data in the African literature [7] [12] [13]. This declining stillbirth rate is indicative of

the significant efforts made to train staff in neonatal resuscitation.

This is a series of retrospective data, and we are faced with missing data.

5. Conclusion

The results of this study confirm one fact: the Saint-Louis regional hospital, by virtue of its geographical position, is a reference center in the system in northern Senegal. The availability of EmONCs has helped to improve maternal and neonatal health indicators in the area. The need to decentralize obstetric and surgical activities to the periphery should therefore be emphasized. This involves training providers in emergency care, making blood and its derivatives available, setting up an obstetric care network and ensuring regular supervision.

Conflicts of Interest

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

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