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Impact of Quality of Care at Delivery on Maternal and Neonatal Morbidity and Mortality in a Referral Facility: The Case of the Coronthie Municipal Medical Center, Conakry, Guinea

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Abstract

Introduction: In Africa, care during childbirth depends on routine practices to the detriment of quality. The aim of this study was to assess the quality of delivery care at the Coronthie CMC. **Methods:** The study was carried out at the Coronthie Community Medical Center. It was a cross-sectional, descriptive and analytical study lasting 6 months, from July 01 to December 31, 2021. Parturients whose term was ≥28 SA and who agreed to participate in the study were included. Excluded were those with a term < 28 SA, or who refused to participate. Data were entered, analyzed and presented using Word, A Epi Info 7.2.2.6 software. **Results:** The frequency of quality care is 36.7%. The average age of parturients was 28.6 ± 5 years. Most parturients (89.7%) were married women with secondary education (35%) and self-employed (32%). Pauciparous women accounted for 43.80%, and most parturients (59.8%) were delivered by Caesarean section. We found that 21.5% of parturients had developed complications. These complications were perineal trauma and post-partum haemorrhage. There were no maternal deaths, and the neonatal mortality rate was 20/1000 NV. Acute fetal distress was the main cause of perinatal death. **Conclusion:** Correct management of factors influencing childbirth could improve maternal and neonatal prognosis.

Keywords

Childbirth, Impact, Quality of Care, Prognosis, Mortality

1. Introduction

Childbirth is the set of physiological and mechanical phenomena that result in the exit of the fetus and its appendages from the maternal genital tract, once the pregnancy has reached the theoretical term of 22 SA [1]. This is a normal physiological process which can take place without complication for the majority of women and children [2]. Skilled birth attendance is the process by which a woman receives adequate care during labor, delivery and the post-partum period. It requires both a skilled attendant and a supportive environment [2]. According to the WHO, quality of care for women and newborns is the ability of maternal and newborn health services (provided to individuals and populations) to increase the likelihood of obtaining prompt and appropriate care in order to achieve desired health outcomes, which are both in line with current professional knowledge and with the preferences and aspirations of women and their families [3]. Quality of care is increasingly recognized internationally as a crucial aspect of the unfinished agenda of maternal and newborn health, primarily in terms of the quality of care surrounding labor and delivery and in the immediate postnatal period. It is recognized that high coverage alone is not enough to reduce mortality. To significantly reduce maternal and neonatal mortality, and make progress towards eliminating preventable causes of maternal and newborn death, improved coverage must be accompanied by improved quality across the entire spectrum of care [3]. In recent decades, the rate of institutional births has risen. This increase is the result of a growing incentive for women to give birth in a healthcare facility. Worldwide, from 1990 to 2014, a 12% increase in the proportion of births attended was reported, which increases the likelihood of receiving quality care [4]. Improving the quality of care has helped to reduce maternal mortality elsewhere. In Europe, for example, an average of 13 deaths per 100.000 live births was observed in 2017 [4]. Sub-Saharan Africa and South Asia accounted for around 86% (254,000) of maternal deaths estimated to have occurred worldwide in 2017, due in part to poor quality of care [5]. In Mali, according to the Demographic and Health Survey (EDSM-VI in 2018), the maternal mortality rate is 373 deaths per 100,000 live births [6]. In Guinea, HATEM M. *et al.*, in 2018, reported 33% of quality deliveries at the I Deen National Hospital, resulting in a high maternal mortality rate of 679/100,000 NV [7].

Insufficient skilled personnel, poor management of those who are, misallocation of scarce resources, poor relations between healthcare staff and pregnant women, and shortages of equipment, drugs and blood are responsible for poor quality maternal care [8]. Strategies identified in the literature as increasing facility deliveries in the context of sub-Saharan Africa include raising community awareness, reducing healthcare expenditure (transport or user fees), non-monetary incentive programs (baby kits), or a combination of these with improving the quality of care (patient privacy, reducing waiting times, training providers), and or monitoring pregnant women to use the health facility for delivery [9].

The objectives of this study were to determine the proportion of quality deliveries in the department, describe the sociodemographic profile of parturients, and identify the impact of quality of care on maternal and neonatal mortality.

2. Methods

Type, duration and setting of study: This was a prospective descriptive and analytical study lasting 6 months, from July 01 to December 31, 2021, carried out in the gynecology-obstetrics department of the Center Médical Communal of Coronthie, a level II referral hospital within the Guinean health pyramid. It performs some 4000 deliveries a year, 35% of which are caesarean sections.

Study population: Our study population consisted of all parturients admitted to the delivery room during the study period.

Selection criteria: All parturients admitted to the delivery room with a term ≥ 28 SA and who agreed to take part in the study were selected. Those who were not in labor, those evacuated or referred to other services before delivery, or those who refused to participate in the study were not included.

Data collection: data were collected by observation and individual interviews, using a questionnaire. These data were supplemented by patient obstetric records, delivery registers and operative reports. A quality birth was defined as any birth taking place in a health-care facility, carried out by qualified personnel, in compliance with standards and with a good maternal and neonatal prognosis.

Sample size: calculated using the Lorenz formula: N = Za2PQ (where: N = acceptable sample size in each group [calculated value = 95.04]; a = statistical significance level D2; Za = normal distribution value = 1.96 for a = 0.05; P = prevalence of caesarean section in the department = 25.7%; Q = 1 − P; D = precision level = 10%). We therefore included 459,520 parturients who met our inclusion criteria and agreed to take part in the study.

Analysis of results: data were entered and analyzed using EPI INFO version 6 software. Data were then transferred to SPSS 21.0 for analysis. Chi2, was the test used with significance alone set at $P < 0.05$. We calculated the mean and Odre Ratio and confidence interval.

3. Results

3.1. Proportion of Quality Deliveries

Of the 469 recorded deliveries, we observed 172 quality deliveries, a proportion of 36.7% (Table 1).

The mean age of our patients was 28.6 years, with extremes of 15 and 42 years. The most represented age group was 25 - 30 with a proportion of 33.7%, followed by 20 - 25 with 27.4% of cases. Almost all parturients (89.7%) were married women. Most of our patients had either secondary or higher education, with proportions of 35% and 34.4% respectively. Almost a third (32%) of our patients were self-employed.

Table 1. Socio-demographic profile of parturients.

Socio-demographic variables	Number	Percentage (%)
Age range		
≤20	74	16.1
20 - 25	126	27.4
25 - 30	155	33.8
30 - 35	73	15.9
35 - 40	30	6.5
>40	1	0.2
Marital status		
Single	45	9.8
Divorced/Widowed	2	0.4
Married	412	89.7
Level of education		
No schooling	81	17.6
Primary	59	12.8
Secondary	161	35
Higher	158	34.4
Profession		
Pupils/students	135	29.4
Employees	88	19.2
Liberal	147	32
Household	89	19.4

Mean age: 28.6 ± 5.41 years Extremes: 15 and 42 years.

3.2. Obstetrical Characteristics

Most of our patients were pauciparous and primiparous, with frequencies of 43.80% and 36.61% respectively (Table 2).

Table 2. Distribution of patients according to parity.

Parity	Number	Percentage (%)
Nulliparous	1	0.2
Primipares	168	36.6
Pauci pares	201	43.8
Multiparous	73	15.9
Large multipares	16	3.5
Total	459	100

3.3. Mode of Delivery

Table 3. Mode of delivery.

Mode of delivery	Percentage %
Cesarean section	267 (56.9%)
vaginal route	202 (43%)
Total	469 (100%)

5% instrumental extraction.

See Table 3.

4. Maternal and Perinatal Prognosis

4.1. Maternal Morbidity

Overall, the majority of patients had a favourable outcome after delivery. Only 21.5% developed complications (73.7% perineal trauma and 22.2% post-partum haemorrhage) (Table 4, Table 5).

Table 4. Mode of delivery and maternal morbidity.

	Mother's condition		
Delivery mode	**With complication**	**No complications**	**Total**
Cesarean section	11(10.8%)	256 (69.5%)	267 (56.8%)
vaginal route	90 (89.1%)	112 (30.4%)	202 (43.1%)
Total	101 (21.5%)	368 (78.4%)	469 (100%)

5% instrumental extraction. P-Value = 0.0001; RR = 0.085 [0.045 - 0.159].

Table 5. Type of maternal morbidity.

Complications	Numbers	Percentage
Perineal trauma	73	73.7
Postpartum hemorrhage	22	22.2
Eclampsia	1	1,0
Suppuration	1	1. 0
Uterine rupture	1	1.0
Vesical detachment	1	1.0

HRP GIIIB of Sher: Retroplacental hematoma Grade IIIB of Sher.

4.2. Maternal Lethality

No maternal deaths were recorded during the study period, although 2.4% of patients were referred to a level 1 hospital for obstetric complications (Table 6).

4.3. Neonatal Morbidity

See Table 6.

Table 6. Distribution of newborns by birth weight.

Weight of newborns	Number	Percentage (%)
<2500	37	7.9
2500 - 3999	392	83.6
≥4000	40	8.5
TOTAL	469	100

NB: we recorded 2.1% twin pregnancies.

4.4. Outcome of Newborns

7.4% of newborns were referred to a neonatology department for neonatal complications. The main reasons for referral were acute fetal distress and prematurity (Table 7).

Table 7. Reasons for reference.

Reference reason	Number	Percentage
Neonatal Asphixia	24	68.6
Prematurity	6	17.1
Malformation	3	08.6
Macrosomia	2	5.7
Total	35	100

4.5. Perinatal Lethality

See Table 8.

Table 8. Relationship between mode of delivery and neonatal lethality.

	Neonatal lethality		
Delivery method	Deceased	Vivant	Total
Cesarean section	3 (33.3%)	264 (57.3%)	267 (56.9%)
vaginal delivery	6 (66.8%)	196 (42.6%)	202 (43.%)
Total	9 (2%)	460 (98%)	469 (100%)

P-Value = 0.086; RR = 0.379 [0.096 - 1.49].

4.6. Mortality

The vast majority of newborns (98%) were born alive. However, we recorded 2% perinatal deaths. Of these, 66.8% were born vaginally. However, we did not find a specific risk of exposure related to the route of delivery (P = 0.086, RR= [0.096 - 1.49]).

The results showed that the main cause of perinatal death was acute fetal distress, accounting for 66.6% of all causes of death. Other causes of death included retroplacental hematoma and uterine rupture. One of the newborn deaths was a polymalform with hydrocephalus, spina bifida and polydactyly (Table 9).

Table 9. Causes of perinatal death.

Cause of death	Number	Percentage
SFA	6	66.6
HRP	1	11.1
Malformation	1	11.1
RU	1	11.1
Total	9	100

5. Discussion

5.1. Proportion of Quality Deliveries

The proportion of quality deliveries during the study was 36.8%. This low proportion could be explained by a number of factors including, among others, low service capacity in relation to activities, shortcomings in the provision of care services, lack of hygiene. In Guinea, HATEM.M *et al.*, in 2018 reported 33% quality deliveries at I Deen National Hospital [7] resulting in a high maternal mortality rate of 679/100,000 NV.

5.2. Sociodemographic Characteristics

• **Age:** the mean age of our patients was 28.6 years, with extremes of 15 and 42 years. However, the most represented age group was 25 - 30 years with a proportion of 33.7% followed by 20 - 25 years with 27.4% of cases. In a study carried out in Guadeloupe in 2013, Butoria J B. *et al.* reported an average age of 30 with extremes of 18 and 44 years [9]. This average age could be explained by the fact that it corresponds to a period of full genital activity whatever the country.

• **Marital status:** Almost all parturients (89.7%) were married women. This proportion is higher than that of Doucin H *et al.*, who reported that 54% of parturients in their sample were married women [10]. This could be explained by the socio-cultural and religious requirements of our context, which make it difficult to conceive outside of marriage, and where marriage is the legal framework for procreation.

• **Educational level:** most of our patients had either secondary or higher education, with proportions of 35% and 34.4% respectively. A WHO global survey showed that fertility was inversely proportional to women's level of education. Women with no education have on average 2 times more children than those with 7 or more years of schooling [3].

• **Profession:** We found that 32% of our patients were self-employed, while pupils and students represented 29.4%. This could be explained by the fact that more and more women are seeking to find an income-generating activity that would make them less dependent on their spouse or family.

5.3. Obstetrical characteristics

• **Parity:** most of our patients were pauciparous and primiparous, with frequencies of 43.8% and 36.6% respectively. Our result is identical to that of Diémé F. M.E, *et al.* in Senegal in 2015 who reported that pauciparous were in the majority with 73.7% of cases with an average parity of three [11]. Efforts must be made by health workers to minimize the risks incurred by these women. This high proportion of pauci pares could be explained by the young age of the patients and the early marriages under our conditions.

• **Mode of delivery:** Most of our parturients (59.9%) gave birth by Caesarean section. This proportion of Caesarean sections is above the national average and is justified by the fact that our service is a referral service for the basic health struc-

tures of the commune and those of certain communes in the capital. Coulm B in France in 2013 reported, that only 10.9% of parturients had given birth by caesarean section including 31.7% primiparous and 68.3% multiparous [12].

5.4. Maternal and Neonatal Prognosis

• **Mode of delivery and maternal morbidity**: results showed that after delivery, most patients did not develop complications, and were discharged with a good maternal prognosis. However, 21.5% had developed complications. The difference was statistically significant (P-Value = 0.0001), although the route of delivery did not appear to increase the risk of complications (P = 0.0001; RR-IC = 0.085 [0.045 - 0.159]).

• **Type of maternal morbidity:** Perineal trauma and postpartum hemorrhage were the most common complications observed after delivery, accounting for 73.74% and 22.2% of all complications respectively. Our complication frequency of 21.5% is lower than the 41.5% of complications reported by, Foumsou L. *et al.* in Chad in 2017 with a predominance of haemorrhage at delivery with 20.7% of cases followed by cervical tear with 9.4% of cases [13].

• **Maternal mortality:** No maternal deaths were recorded during the study.

• **Neonatal morbidity:** 7.4% of newborns had been referred to a neonatology department for neonatal complications. The main reasons for referral were acute fetal distress (68.6%) and prematurity (17.1%). In addition, 8% of newborns were of low birth weight and 8.5% were macrosomic. The proportion of twin pregnancies was 2.1%.

• **Neonatal mortality:** The vast majority of newborns (98%) were born alive. However, we recorded 2% perinatal deaths. Of these, 66.8% were born vaginally. However, we did not find a specific risk of exposure linked to the route of delivery (P = 0.086, RR = 0.379 [0.096 - 1.49]). In a study carried out in several West and Central African countries, Pruel. A *et al.* report neonatal mortality rates that vary widely from one country to another. Thus we note, 12‰ NV (ODD already reached) in Cape Verde, 21‰ nv in Senegal and 34‰ NV in Nigeria [5]. The influence of this quality of care can be seen by comparing the perinatal mortality rate in developed countries, which is <10/1000 NV versus 27‰ nv in Lumumbassi, and 87‰ in Kinsassa in 2019 **[14]**.

• **Causes of neonatal death:**

The results showed that the main cause of perinatal death was acute fetal distress, accounting for 66.6% of all causes of neonatal death. The other deaths had various causes: retroplacental hematoma, uterine rupture. One of the newborns who died was poly malformed with hydrocephalus, spina bifida and polydactyly. Foumsou L *et al.* in Chad in 2017 reported that the neonatal complications listed were neonatal death 4.3%, respiratory distress 2.3% and prematurity 1.9% [13].

6. Conclusions

During the study, it was noted that the service offers a low proportion of quality

care. Parturients were young women with an average age of 28.6%. Almost all parturients (89.7%) were married, uneducated and self-employed. Most were poor. More than half of our parturients (56.9%) had given birth by caesarean section. Most caesarean sections are performed on an emergency basis, exposing the patient to complications and lowering the quality of care. Perineal trauma and post-partum haemorrhage were the most common complications, a sign of poor care. This increases the risk of maternal morbidity and lowers the quality of care. No maternal deaths were recorded during this study period.

The results showed that the main cause of perinatal death in this study was acute fetal distress, accounting for 66.6% which indicates poor monitoring of parturients and increases perinatal mortality. Reducing maternal and neonatal morbidity and mortality requires the provision of quality care for the benefit of both mother and newborn.

Ethical Considerations

Data were collected anonymously and the information obtained was used for purely scientific purposes.

Conflicts of Interest

The authors declare that they have no conflict of interest in this work.

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