

Research Article

Perinatal Mortality: Frequency and Risk Factors in the Maternity of the Communal Medical Center of Matam

Diallo Fatoumata Bamba^{1*}, Diallo Mamadou Hady¹, Balde Ousmane¹, Diallo Mamadou Lamarana Cire³ and Balde Ibrahima Sory²

¹University Department of Gynecology-Obstetrics, Donka National Hospital, Conakry, Guinea

²University Department of Gynecology-Obstetrics, Ignace Deen National Hospital, Conakry, Guinea

³Maternity Ward of Matam Communal Medical Center (CMC), Conakry, Guinea

Abstract

Objectives: To determine the rate of perinatal mortality, to describe the socio-demographic profile of parturient, to find the main causes and to identify the risk factors linked to this perinatal mortality.

Methodology: This was a prospective, descriptive and analytical study of the case-control type carried out at the maternity ward of the communal medical center of Matam, over a period of 12 months from October 1, 2020 to September 30, 2021, having concerned all pregnant women whose term is greater than or equal to 22 weeks of amenorrhea admitted to the service and newborn babies aged no more than 07 days who died during the study period.

Results: We recorded 160 cases of perinatal mortality out of a total of 4034 deliveries, a rate of 39.7‰. The mean age of the patients was 24.21 years ± 6.6 years. The nulliparous were the most affected (38.75%) versus (10.31%). Admission mode was associated with perinatal mortality with P value = 0.00. The associated risk factors were: age, medical history (arterial hypertension (16.90%) versus (6.60%); diabetes (10.06%) versus (5.30%); and malaria (88.75%) versus (43.10%), parity, mode of admission and level of education.

*Corresponding author: Diallo Fatoumata Bamba, University Department of Gynecology-Obstetrics, Donka National Hospital, Conakry, Guinea, Tel: +00224 622542857; E-mail: fabambadiallo@gmail.com

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The main maternal causes of perinatal death were arterial hypertension and/or its complications (35 %), anemia (14.37%) and neonatal asphyxia (13.13%) for the fetal one.

Conclusion: The reduction of this perinatal mortality rate would go through the improvement of the schooling of the young girl, the correct management of maternal pathologies during pregnancy and the offer of quality prenatal consultations.

Keywords: Frequency; Matam; Perinatal mortality; Risk factors

Introduction

Perinatal mortality is defined as the death of the fetus occurring between the 22nd week of gestation and the 7th day of life inclusive or that of a newborn with a birth weight greater than or equal to 500 grams, if the gestational age is unknown [1]. It includes stillbirths and early neonatal mortality. The birth of a stillborn child or the loss of a newborn constitutes a family drama for which we try to find often fatalistic explanations [2]. Deaths during the first month of life (the neonatal period) account for approximately 45% of mortality in children under 5 years old. Of these deaths, the majority (75%) occur within the first 7 days of life (the early neonatal period), and more than 50% occur within the first 24 hours [3]. Thus the early neonatal period is the most critical period for an infant [4]. The determinants of perinatal mortality are attributed to the socio-demographic characteristics of the patients, to the diseases associated with pregnancy and to the care provided during pregnancy, childbirth, and the immediate postpartum due to the lack of appropriate neonatal care [5].

The causes are many and vary depending on the health status of the mother and access to prenatal care. About 99% of deaths occur in low- and middle-income countries [6]. In areas where pregnant women have access to quality health services, congenital malformations, premature births and intrauterine growth retardation are the main causes, while in areas where health service coverage is low, the main causes of perinatal mortality are asphyxia, neonatal tetanus and infections [7]. The perinatal mortality rate is used as one of the indicators of quality of care given during the prenatal and perinatal period. Of the 136 million births occurring each year worldwide, approximately 3.7 million die during the neonatal period and 3.3 million are stillbirths, of which more than 97% occur in low- and middle-income countries. In developed countries, the perinatal mortality rate is estimated at 10 deaths per 1000 live births [8]. In France in 2019, this rate was 10.2‰ [9].

In developing countries, it is 50 deaths per 1000 live births and sub-Saharan Africa has the highest rate of perinatal deaths (56 per 1000 live births) [10]. Studies carried out in Mali and Burkina Faso reported perinatal mortality rates of 46.53‰ and 79‰ births [11,12]. In Guinea, this rate was 39‰ births according to the 2018 demographic health survey [13]. The high rate of perinatal mortality, the multiplicity of causes and the lack of previous study in this service motivated the realization of this study. The aim of this work was to contribute to the study of perinatal mortality at the maternity ward of

the communal medical center of Matam. The specific objectives were to determine the perinatal mortality rate, to describe the sociodemographic profile of the patients, to seek the main causes and to identify the risk factors linked to this mortality.

Patients and methods

This study took place at the maternity ward of the communal medical center of Matam. This was a prospective descriptive and analytical case-control study lasting 12 months from October 1, 2020 to September 30, 2021. Were included in our study, all deaths of a child under 22 WA or whose weight was ≥ 500 grams with a zero Apgar score at the first or fifth minute, newborns who died during of the first seven (07) days of life, and the parturient who gave birth and who agreed to participate in the study. To highlight the risk factors related to perineal mortality, a control population was formed from a sample which was represented by live newborns, born immediately after death and whose mothers had agreed to participate in the study. The group of witnesses was chosen because of a case for two witnesses. We're not included in the study, births at home or in other structures, deaths occurring after the seventh day postpartum, cases of abortions, gestational age below 22 weeks and patients who did not agree to participate in the study.

The variables studied were the perinatal mortality rate (stillbirth rate and the early neonatal mortality rate), sociodemographic characteristics (age, profession, marital status, level of education, parity, toxicological and medical history, mode of admission, means of transport), perpartum data (reason for admission, type of pregnancy, gestational age, prenatal care, state of the membranes, state of the amniotic fluid, fetal heart sound, mode of delivery, assessment for etiological research) and neonatal data (Apgar score, type of stillbirth, birth weight and cause of death). The data were collected prospectively from data from the clinical examination of parturient, childbirth, clinical examination of newborns, direct interview of parturient, verification of CPN notebooks and the evacuation sheet. Data were analyzed using Epi Info software version 7.2.2.6. Paerson's Chi 2 test was used for the comparison of qualitative variables. The significance level was set at p value < 0.05 . The research protocol was approved by the national ethics committee with informed consent.

Results

Perinatal mortality rate: during the study period, we recorded 160 cases of perinatal death out of a total of 4034 births carried out at the maternity ward of the communal medical center of Matam, i.e. a rate of 39.7‰ with 37.4‰ stillbirth rate and 2.3‰ early neonatal mortality rate.

Sociodemographic characteristics: The sociodemographic profile was that of a patient in the age group of 18-34 years (61.20% versus 80%), housewife (48.10% versus 44.30%), married (86, 90% versus 92.50%), no schooling (52.50% versus 50.31%), nulliparous (38.75% versus 10.31%), residing outside Matam (58.75% versus 33.75%), from private clinics (51.25% versus 8.12%) and evacuated (74.40% versus 16.90%) (Table 1).

Toxicological history: In 91.25% versus 90.60% of cases, patients did not use toxic substances before the current pregnancy. There was no statistically significant difference $P=0.50$.

Characteristics of parturient	Cases = 160		Witnesses = 320	
	Workforce	%	Workforce	%
Age				
<18	19	11.90	30	09.30
18 - 34	98	61.20	256	80.00
≥ 35	43	26.90	34	10.70
		P=0.00		
Profession				
Housewife	77	48.10	142	44.30
Libéral	55	34.40	146	41.60
Pupil/Student	20	12.5	32	10.00
Official	8	05.00	13	04.10
		P=0.65		
Marital Status				
Single	21	13.10	24	07.50
Married	139	86.90	296	92.50
		P=0.02		
Level of Education				
No schooling	84	52.50	161	50.31
Primary	16	10.00	25	07.81
Secondary	43	26.90	94	29.38
Superior	17	10.60	40	12.50
		P=0.74		
Parity				
Nulliparous	62	38.75	44	10/31
Primiparous	28	17.50	54	13.75
Pauciparous	33	20.70	189	59.06
Multiparous	37	23.05	33	16.88
		P=0.00		
Residence				
Matam	66	41.25	212	66.25
Outside Matam	94	58.75	108	33.75
		P=0.00		
Mode of admission				
Coming of herself	41	25.60	266	83.10
Evacuated	119	74.40	54	16.90
		P=0.00		

Table 1: Characteristics of parturient.

Medical history: In our series, patients with a history of arterial hypertension (16.90% versus 6.60%), diabetes (10.06% versus 5.30%), malaria (88.75% versus 43.10%) and pneumonia (11.25% versus 5.60%) were more exposed to the occurrence of perinatal mortality with differences that were statistically significant with $P=0.00$ for hypertension and $P= 0.01$ for the other pathologies. On the other hand, there was no statistically significant difference in the case of a history of urogenital infection (68.75% versus 71.25%; $P=0.28$).

Obstetrical history: History of stillbirth (15.60% versus 15.00%) and caesarean section (08.75% versus 11.56%) had no influence on the occurrence of perinatal mortality in our sample. The differences observed were not significant.

Birth interval of births: In 48.75% versus 75.31% of cases, patients had observed a delay of 2 years or more before contracting a new pregnancy. The observed difference was statistically significant with $P=0.00$.

Perpartum data (Table 2)

Reasons for admission: In our series the absence of active movement of the fetus (63.75%), uterine contractions (26.25%), headaches (26.25%), dizziness (21.25%), premature rupture of membranes (11.25%), fever (11.25%), bleeding (08.75%) and epigastralgia (05.00%) were the main reasons for admission.

Gestational age: The majority of patients had a gestational age between 28-38 SA with a proportion of 44.37%.

Content of the CPN	Cases = 160		Witnesses = 320	
	Workforce	%	Workforce	%
Number				
0	5	03.11	5	01.60
1	32	20.00	5	01.60
2	75	46.88	30	09.40
3	33	20.63	102	31.90
4	15	09.38	178	55.50
$P=0.00$				
Tetanus vaccine				
Yes	112	76.25	311	97.19
No	38	23.75	9	02.81
$P=0.00$				
Iron Folic Acid				
Yes	88	55.00	310	96.87
No	72	45.00	10	03.13
$P=0.00$				
Intermittent Preventive Treatment of Malaria				
Yes	76	47.50	309	96.56
No	84	52.50	11	03.44
$P=0.00$				
HIV serology				
Yes	3	01.87	26	08.13
No	157	98.13	294	91.87
$P=0.00$				
Hemoglobin level				
Yes	45	28.13	278	86.88
No	115	71.87	42	13.12
$P=0.00$				

Table 2: Content of the Prenatal Consultation (CPN).

Appearance of the amniotic fluid: in the population studied, more than half of the patients presented amniotic fluid of a yellowish color (58.75%) against 12.50% in the controls. The observed difference is statistically significant with a P value = 0.00.

Fetal heart sound: In our sample, the majority of patients were admitted with no fetal heart sound on obstetric examination with a proportion of 78.12%.

Way of delivery: Delivery by vaginal route was more frequently represented in the cases and in the controls with respective frequencies of 81.87% versus 81.25%. Caesarean section was performed in a proportion of 18.13% versus 19.75%. The observed differences were statistically insignificant.

Assessment for etiological research: In our series 72.50% of patients did not perform assessment for etiological research. Those who did were in the minority with 27.50%.

Neonatal data (Table 3)

Apgar score	Cases = 160		Witnesses = 320	
	Workforce	%	Workforce	%
Apgar in the 1st minute				
≥ 7	6	03.75	318	99.37
4-6	6	03.75	2	00.63
0-3	148	92.50	0	00.00
$P=0.00$				
Apgar in the 5th minute				
≥ 7	6	03.75	320	100.00
0-6	154	96.25	0	00.00
$P=0.00$				

Table 3: Apgar score.

Type of stillbirth: We recorded 75.62% macerated stillbirths and 24.38% non-macerated stillbirths.

Birth weight: More than half of the newborns at birth had a weight between 500-1500gr (56.00%) on the other hand 46 newborns had a normal weight (2500-4000gr) with one case of fetal macrosomia.

Cause of death: In our sample, arterial hypertension and/or its complications (35.00%), anemia (14.37%), neonatal asphyxia (13.13%) and severe malaria (09.38%) were the most common causes of perinatal death.

Discussion

Perinatal mortality rate: Our perinatal mortality rate (39.7‰) was higher than those reported in developed countries with 10.2‰ in France and 13.6‰ in Georgia [9,14]. On the other hand, in developing countries, our rate is significantly lower than those of Andargie G [15] in Ethiopia (50.22‰) and Diallo AH [12] in Burkina Faso (79‰). Our high rate could be explained by the fact that the study took place in a level II reference center in the health pyramid of our country, receiving patients from the health structures (public and private) of the municipality of Matam and other municipalities of the city of Conakry. The antepartum period had the largest proportion with 70%. The finding was similar in the multicenter study conducted by the WHO in the Republic of South Africa and the United Kingdom in 2016 with 50% and 48.3% respectively [16]. This high percentage of perinatal deaths during the antepartum period would be the translation of the insufficiency in the offer of prenatal visits on the one hand and on the other hand that of the means of surveillance.

Risk factors

Maternal characteristics

The highest proportion of women victims of perinatal death in our series were between 18 and 34 years old (61.25% versus 80%) and

greater than or equal to 35 years old (26.90% versus 10.70%). The difference was statistically significant ($P=0.00$). Our result is identical to that of Mulongo Mbarambara P [17] in the Democratic Republic of Congo who reported that the advanced age of the mother had multiplied the risk of perinatal death by 2.1, but contrary to that of Kamate MH [11] in Mali which had reported a proportion of 43.6% for those who were under 20 years old. The high percentage in our study for these age groups would be due to the fact that it corresponds to the period of intense sexual and reproductive activity. Women with no schooling were the most exposed (52.50% versus 50.31%) in our series. Mutihir and et al., [18] in Nigeria reported a significant association between maternal education and stillbirth ($P=0.01$) and a study in Brazil also reported an association between low education and stillbirth ($OR= 1.6$; 95% $CI= 1.02-2.6$) [19]. This high frequency of out-of-school patients in our series could be explained by the fact that they are the most numerous in the general population and have little information on reproductive health and therefore are rarely followed up and escape thus any possibility of screening for danger signs linked to perinatal mortality.

In our study, housewives were the most numerous (48.10% versus 44.30%). This result is different from that of Kamate MH [11] in Bamako in 2018 which reported 97.7% of housewives. This could be explained by the fact that housewives constitute the most important female stratum in our society with a low level of education, subject to domestic work and poverty. Married patients had dominated in the 2 groups (86.90% versus 92.50%) with a statistically significant difference ($P=0.02$). This result corroborates that of Andargie G [15] which found 87.5% of married women. The high percentage of married women would be justified by their high proportion in the general population on the one hand and on the other hand by the fact that marriage constitutes the only framework, the equal recognized by customs and mores for procreation in our companies.

The nulliparous were the most affected by perinatal mortality (38.75 versus 10.31%) with a statistically significant difference ($P=0.000$). On the other hand, in the study by Mulongo Mbarambara P [17], multiparity was the factor most associated with perinatal death ($P=0.0007$). This high percentage of nulliparous would be due to the predilection of vascular-renal syndromes and their complications. The mode of admission was associated with perinatal mortality (74.40% versus 16.90%) with a statistically significant difference ($P=0.00$). This high frequency could probably be explained by the delay in making the decision to evacuate or refer after noting a fetal complication for the fetus.

History of the parturient

Medical history was strongly associated with perinatal mortality. Malaria was dominant in 88.75% of cases in our study. The same observation was made by Kamate MH [11] in Mali with a risk of perinatal mortality which was associated with not taking antimalarial during pregnancy ($P=0.001$). Pena-Rosas [20] reported in 2012 that the use of intermittent preventive treatment during pregnancy could reduce perinatal mortality. This high frequency of malaria in our series is linked to the high malaria endemicity of the country, hence the need for effective coverage of pregnant women by intermittent preventive treatment and the supply of pregnant women with long-lasting impregnated mosquito nets action during refocused CPNs.

Women who had a history of stillbirth were the least affected, i.e. 15.60% of cases. Results differ from those of Mulongo Mbarambara

and et al., [17] who found that a history of stillbirth has a 3.8 times risk of perinatal death. Our result could be explained by the absence or poor quality of CPN, most often made by unqualified professionals.

Prenatal consultation: In our series, 3.13% of patients did no CPN, 86.51% performed 1-3 CPN and only 9.38% had 4 CPN. Dowsell and et al., [21] found in their study that the reduced number of CPNs (4 to 9) was associated with a 14% risk of perinatal mortality compared to standard consultations. Our results confirm the literature data regarding the influence of CPN on pregnancy follow-up. However, the refocused CPN emphasizes their quality rather than their number.

Mode of delivery: The majority of patients gave birth vaginally in our study (81.88%). In the study by Tina Kataméa [22] in the Congo, the same observation was made with a frequency of 90%, but the newborns born by the low dystocic route died 7 times than those born by the low eutocic route or the high route (cesarean section). The high proportion of perinatal mortality by the vaginal route could be explained by late obstetrical evacuations carried out in poor conditions.

Fetal characteristics

Gestational age had a strong association with perinatal death ($P=0.00$), the highest proportion of which was recorded in fetuses whose gestational age was between 28-33 WA with 44.38%. A study carried out in Congo in 2014 found that the average gestational age of 33.4 ± 4.5 SA was strongly associated with the risk of perinatal death with $P=0.0000$ [22]. This result could be justified by vascular-renal syndromes and funicular complications which constitute risk factors for perinatal morbidity and mortality. The highest proportion of perinatal death was recorded in newborns whose birth weight is less than 2000g with 53.75%. Our results corroborate those of Ntambue A and et al., [23] in Lubumbashi in 2013 who reported that low birth weight below 1500g was strongly associated with the risk of perinatal death with $P < 0.001$; $OR=12.2$ (7.2-20.7). This observation in our study could be explained by the fact that newborns with a low birth weight are often premature and very vulnerable to the risk of asphyxia, infection and microtraumas during vaginal delivery.

During the study period the male sex had largely dominated (69.38% against 30.63%). Our rates are higher than those of Mulongo Mbarambara P and et al., [17] in Congo who had reported a male predominance of 36.1% but different from that of Andargie G [15] who had reported a female predominance which was significantly associated with perinatal death with $OR=1.61$ (1.04-2.67). These different results are only coincidences because no study demonstrates with certainty the role of sex in perinatal mortality. The predominance of perinatal mortality in the male sex raises questions and should be the subject of further research.

Causes

It appears from our study that 35% of perinatal death cases were due to arterial hypertension and/or its complications followed by anemia in 14.37% and neonatal asphyxia with 13.13%. In the study by Ntambue A and et al., [23], the causes of perinatal mortality were more frequently represented by respiratory distress (58.2%) and neonatal infections (13.5%). Result different from those of Manjavidze T and et al., [14] in Georgia who had noted a predominance of prematurity and congenital malformations with respective frequencies of 58% and 23%.

Conclusion

The perinatal mortality rate was 39.7%. The risk factors associated with perinatal death were the mother's age, medical history (arterial hypertension, diabetes and malaria), parity, mode of admission, content of ANC and aspect of amniotic fluid. Reducing this perinatal mortality rate would require improving the schooling of young girls, the correct management of maternal pathologies and the provision of quality prenatal consultations.

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