

## Study on Paediatric Emergencies: Neonatal Case from Bonzola Hospital

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Received: October 25, 2021

Published: December 27, 2021

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### Abstract

**Introduction:** Globally, more than four million children under one month die each year ; about 40% of deaths of children under 5 occur during the neonatal period, most of which during the critical phase which constitutes the first week of life. The objective of this is to assess the frequency and severity of neonatal medical emergencies and relate the most common warning signs in new-borns.

**Materials and Methods:** We conducted a retrospective descriptive study from 1<sup>st</sup> January to 31 December 2020 newborns hospitalized in the neonatal unit of emergencies of the Bonzola hospital.

**Results:** We collected 468 babies (49.1%) in emergency situations out of 953 admitted. The sex ratio was 1.23. Neonatal medical emergencies were mainly in order of frequency: prematurity (34.8%), neonatal infection (26.7%), neonatal asphyxia (20.7%), respiratory distress (7.1%), intrauterine growth retardation (6.2%) The case fatality rate was 33.3%. The main causes of death from neonatal medical emergencies were: prematurity (51.3%), neonatal asphyxia (17.1%), respiratory distress (12%), neonatal infection (10.7%). Warning signs for families and/or health workers were mainly: thermal irregularities (28.4%, Low birth weight PN <1500 and/or GA <32SA (23.5%, skin colour abnormalities (13.5%), breathing difficulties (12.6%).

**Conclusion:** Awareness, information, and education of mothers before discharge from hospital on the warning signs that may occur in newborns should reduce neonatal mortality.

**Keywords:** Newborn; Warning Sign; Neonatal Emergency

### Abbreviations

GA: Gestational Age; LA: Amniotic Fluid; LAMA: Ancient Meconium Amniotic Fluid; MDG: Millennium Development Goal; WHO: World Health Organization; PN: Birth Weight; SA: Week of Amenorrhea; UNICEF: United Nations International Children's Fund; UUNN: Neonatal Emergency Unit

### Introduction

During the neonatal period, various pathologies lead to disorders perceived as prodromal signs starting from a change in the

baby's habits to much more obvious signs which are observed by the family circle and the nursing staff. Globally, more than four million children under one month die each year ; around 40% of deaths of children under five occur during the neonatal period [1], most of which during the first half of the year. critical phase which constitutes the first week of life [2]. In India, more than 900,000 neonatal deaths are reported each year, nearly 28% of the world total ; Nigeria, the seventh most populous country in the world, is today the second country in number of neonatal deaths whereas it was the fifth in 1990 [3]. The Democratic Republic of Congo ranks

fifth after India, Nigeria, Pakistan, and China in neonatal deaths [4]. The Millennium Development Goal (MDG) aims to reduce the infant mortality rate by two thirds, from 93 per 1000 children dying before age 0 of 5 in 1990 to 31 per 1000 in 2015 [5]. This situation encourages us to better understand the Congolese data, particularly those from Kasai, on diseases of the newborn in the context of medical emergencies. We propose to carry out a study on neonatal medical emergencies in order to: identify the most frequently encountered pathologies, identify the most common warning signs in newborns in the neonatal emergency unit of the Bonzola hospital and determine the main causes of death from neonatal medical emergencies. In order to achieve our objectives, we have opted for a retrospective and descriptive study which will be carried out in newborns treated in a medical emergency context. in the neonatal unit of Bonzola hospital from January 01 to December 31, 2020. We have included all newborns admitted for a neonatal medical emergency and the files of newborns who have had to present a congenital malformation will be excluded.

## Material and Methods

### Site of study

Our study was carried out in the neonatal emergency unit of the pediatric service of the Bonzola Hospital which is a general referral hospital in the Bonzola health zone, located in the town of Mbuji-Mayi, Kasai province. Oriental, in the Democratic Republic of Congo.

### Period and type of study

We have conducted a study retrospective and analytical on issues of newborns hospitalized in the neonatology unit of emergencies, received the 1<sup>st</sup> January 2020 to 31 December 2020, a period of 12 months.

### Target population

Our population consisted of babies from 0 to 28 days old, hospitalized in the neonatal emergency unit (UUNN) during the period of our study.

### Size sampling

Our study relates to 468 files of newborns having undergone a neonatal emergency out of 953 newborns admitted to the neonatal emergency unit (UUNN). This selection was based on a set of criteria.

### Criteria for selection

#### Inclusion criteria

Newborns who have fulfilled the following criteria are retained as part of our sample:

- Being hospitalized in the neonatal emergency unit (UUNN)
- To have a file containing the parameters of the mother and those of the newborn necessary for our study.

#### Exclusion criteria

Are excluded:

- The records of babies having a simple postnatal continuation, as well as cases of malformations showing no sign of medical emergency.
- Newborns who do not have a complete medical record.

### Study parameters

It is a question for us of studying the different pathologies considered as a medical emergency in the newborn by highlighting the various warning signs and the fate of the babies received in the neonatal emergency unit of the Bonzola hospital. To achieve this, we have studied the following parameters:

#### Data concerning the mother

- Maternal age,
- Parity
- Signs of maternal infections: Fever, Dysuria, Flu syndrome, Purulent leucorrhea, Premature rupture of the water bag for more than 12 hours, LAMA and odorless (Chorio-Amnionitis).

The data concerning the newborn are: Gender, Age at admission, Weight at birth, Gestational age, APGAR score at the 5<sup>th</sup> minute, Warning signs in the newborn born noted by families and/or nursing staff, The diagnosis retained, The immediate outcome.

### Ethical consideration

The verbal, free and informed consent obtained in the files of neonatal babies was confidential. The information or data from this study was used for research purposes only. A research and data collection authorization letter has been signed by the competent authorities.

Processing and analysis of data

The data collected were encoded on a database of Excel 2007 software then they were imported into Epi-info software version 7.0.

Results

Prevalence of medical emergencies

Among the 953 cases of infants received in the neonatal unit of emergencies (AANN) during our study period from 1<sup>st</sup> January 2014 to 31 December 2014, we selected 468 medical emergencies, a frequency hospital rate of 49.1%.

Epidemiological parameters of babies admitted for a medical emergency

Parameters linked to the mother (Age, parity Infectious context during pregnancy and childbirth

- Maternal age ranged from 16 to 45 years with an average maternal age of 26.6 years and a median of 25. We noted a frequency of 41.7% of women whose age range is between 25 and 34 years and 9% of women under 18. Years.
- We note a frequency of 44.65% of multiparous women.
- We note a frequency of 24% of cases of early rupture of membranes lasting more than 12 hours followed by 23% of cases of women who presented with fever during labor and/or childbirth.

Figure 1: Distribution of newborns according to the infectious context.

Newborn parameters

We note a frequency of 57.7% of male newborns and 42.3% of female newborns with a sex ratio of 1.36, NN's age at admission varies from 0 to 28 days with a frequency 74.79% of NN admitted from the day of birth. Newborn weight ranges from 600g to 4800g, with an average weight of 2544g and a median weight of 2600g. The less than 2500 g made up 46.6% of the series and the less than 1500g the 9.8% of the series. gr. The age in week of amenorrhea varies from 23 to 43 weeks. We note a frequency of 34.9% of newborns who were born before 36 weeks of amenorrhea. We note from the vital examinations of the first 5 minutes of birth that 44.5% of newborns were in an alarming situation with an Apgar score less than or equal to 7, including 5.8% in a state of apparent death with an Apgar score less than or equal to 3.

Diagnosis retained

Diagnostic		NOT	%	
Prematurity		163	34.8	
Infections	Materno-fetal	75	16	26.7
	Non-maternally transmitted neonates	48	10 , 3	
	Neonatal tetanus	2	0.4	
Asphyxia (perpartal and/or neonatal)		97	20.7	
Respiratory distress		33	7.1	
Intrauterine growth retardation		29	6.2	
Anemia		14	3	
Neonatal jaundice		4	0 , 9	
Gastrointestinal bleeding		3	0.6	
Total		468	100	

Table 1: Distribution of the different neonatal pathologies.

In the light of this table, we note that prematurity represents a rate of 34.8% followed by neonatal infections with 26.7%.

Warning signs

We noted a frequency of 29.4% of newborns who presented as warning signs, a thermal irregularity followed by 23.1% of newborns whose PN <1500 and/or GA <32 WA.

Warning signs		Not	%
Thermal irregularity	Hypothermia	44	9, 4
	Hyperthermia	94	20
Low birth weight <1.5 kg or very prematurity (GA <32 weeks)		108	23.1
Breathing difficulties		58	12.4
Brain pain	Lethargy	36	7.7
	Convulsion	14	3
Digestive signs	Feeding difficulties	27	5.7
	Vomiting	15	3.2
	Gastrointestinal bleeding	3	0.6
	Diarrhea	5	1.1
Skin color abnormality	Jaundice	4	0.8
	Cyanosis	46	10
	Pallor	14	3
Total		468	100

**Table 2:** Distribution of cases according to the warning signs (i.e. having motivated the consultation).

Warning signs	Not	%
Thermal irregularities	138	29, 4
PN <1500 and/or AG <32 SA	108	23.1
Skin color abnormality	64	13.8
Breathing difficulties	58	12.4
Digestive signs	50	10.7
Brain pain	50	10.7
Total	468	100

**Table 3:** Classification of warning signs in newborns.

	Death	%
Prematurity	81	51,3
Neonatal asphyxia	27	17.1
Respiratory distress	19	12
Neonatal infections	17	10.7
Anemia	8	5.1
Hypotrophy	5	3.2
Gastrointestinal bleeding	1	0.6
Total	158	100

**Table 4:** Distribution of death cases according to emergency.

From this table, we find that of all emergencies, prematurity had a death rate of 51.3% followed by neonatal asphyxia with 17.1% of cases.

## Discussion

### Frequency of newborns admitted for an emergency

In our study, the hospital frequency of newborns presenting a medical emergency was 49.1%; This frequency is a little high compared to that found by TETTO TH. in epidemiological and clinical aspects of medical neonatal emergencies observed complex mother-child university hospital of Mahajanga in Madagascar, a study from 1<sup>st</sup> January to 31 December 2009 and retained 645 cases received in 1541 if a frequency of 41.86% [6]. Our frequency is obviously very high if we compare it to that of BOBOSSIS. [7] who carried out a study on neonatal morbidity and mortality at the pediatric complex of Bangui in the Central African Republic, from 1996 to 1997. Congenital malformations were included in his study and He identified 1032 cases out of 9150 entering or 11.28%. AZOUMAH KD [8] worked for 12 months, from 1<sup>st</sup> January to 31 December 2004 at the pediatric ward of the University Hospital Kara in Togo. He included neonatal malformations and trauma in his study and identified 138 cases out of 1051, or a frequency of 13.13%. Thus our high frequency could then be explained by various factors including the methodology of data collection, the size of the sample, and the hazards of a retrospective study, for example the overestimation of cases.

### Maternal parameters

In our study, the youngest mother was 16 years old. With the maximum age of 45, we obtained an average of 26.6 years. We noted a frequency of 41.7% of women whose age range is between 25 to 34 years, which can be explained by the fact that this is the age group of women active sexually. This frequency exceeds a little that noted by TETTO TH. in Madagascar (40%) [6]. We noted a frequency of 44.65% of multiparous women. Several factors put the woman in an infectious context. Six risk factors are recognized in several studies carried out on the African continent. These are: the premature rupture of the membranes which occurs more than 12 hours before childbirth, the anomaly of the amniotic fluid which can be nauseating, meconium, maternal fever, before birth, during or after childbirth, leucorrhoea, dysuria. Several women having presented an infectious context still remained without treat-

ment until the birth of the baby. In our study, among the babies selected, 24% came from mothers who had premature rupture of membranes ; 22.6% were mothers who presented with fever during labor and/or delivery ; 16.2% of LAMA and odorless ; 7.6% of leucorrhoea ; 3% dysuria. According to the literature, these factors are in most cases the cause of prematurity, IUGR, maternal-fetal infections, etc. [9] TETTO TH. found in his study a rate of 28.2% of premature rupture of membranes ; 6.4% fever ; 18.1% of leucorrhoea ; 34% of LAMA ; by 33.5% prolonged work ; 2.3% dysuria [6] ; BOBOSSI S. noted 11.5% prolonged rupture of membranes, 63.6% maternal fever [7]. Even if these rates differ, these risk factors are at the origin of the infections ascending to 30% [9].

### Parameters related to the newborn

In our study, the sex of the baby has no influence on the occurrence of a state of emergency. We noted 198 babies or 42.3% female and 270 or 57.7% male with a sex ratio of 1.36. TETTO TH reported a sex ratio of 0.99 [6] and AZOUMAH of 1.26 [8]. We see a difference here, but the conditions studied are not related to the sex of the newborn. The weight of babies varies from 600 to 4800g. We noted a number of 208 (46.6%) newborns with low birth weight. This rate is very high compared to those found by BOBOSSI S. (22.2%) [7], TRAORE (17.2%) [10] and by TETTO TH. (41.4%) [6]. The cases of very low birth weight, that is to say less than 1500g, numbered 46 (9.8%) in our study. This is a warning sign of danger according to the WHO [2]. More than a third of 163 babies (34.9%) are premature. Prematurity is a major risk because there is immaturity in large systems. Anything that exposes the baby to the risk of hypothermia and above all infectious risks linked to the immaturity of the immune system. The newborn in a state of apparent death (Apgar less than 4) represented a rate of 5.8% of the 5<sup>th</sup> minute. This determines the suffering states in babies. This rate is very low compared to that found by TETTO TH (6.6%) [6], BOBOSSI S (13.3%) [7] and by AZOUMAH (25.36%) [8]. In these newborns, there is very often cerebral pain such as lethargy or convulsion. According to the WHO, lethargy is a warning sign in newborns. The prematurity was the main cause of neonatal morbidity with 34.8% of cases. It is followed by neonatal infections with 26.7%. Unlike the studies conducted by TETTO TH (52.6%) [35], BOBOSSI S (47.9%) [7], AZOUMAH (58%) [8] where they found neonatal infections as the cause of neonatal morbidity. Our prematurity frequency is higher than that found by TETTO TH (20.3%) [6], AZOUMAH noted

a rate of 28.26% [36] and is lower than the frequency recorded by NYENGA MA, MWANANTEBA., *et al.* 43% in profile and risk of mortality in premature infants at Send we Hospital [11]. Admittedly, this frequency of prematurity could be explained by various factors including the multiparity of mothers 44.65%, advanced maternal age (41.7%), the infectious context noted during pregnancy: purulent leucorrhea, early rupture of membranes etc... Neonatal infections were the second cause of morbidity with 26.7% of cases. This rate is lower than that noted by BOBOSSI S (47.9%) [7], TETTO TH (52.6%) [6], AZOUMAH (58%) [8]. The signs presented by babies who alerted families and/or health workers were mainly thermal irregularities with 29.4% including 20% fever and 9.4% hypothermia. Hypothermia is often viewed by families as the child's exposure to cold. However, it can also testify to a central thermal regulation disorder, accompanying a poor neurological state or a severe infectious state. If the fever is explained by an overheating of the atmosphere or an excessive covering of the newborn, it can guide the diagnosis of a bacterial infection. These signs may be in favor of infection, prematurity or hypotrophy. Given the absence of energy reserves and the immaturity of the immune system, premature babies as well as hypotrophs have an increased risk of hypothermia and infection [14].

The case fatality rate was 33.3% in our series. This rate is almost the same as that found by AZOUMAH (33%) [8] and higher compared to those noted by BOBOSSI S (28.4%) [36] and TETTO TH noted a frequency of 12% [6]. Our high rate could be explained by various factors, including the fact that we calculated it in relation to different neonatal medical emergencies and by a lack of equipment and certain resuscitation equipment. In our study, the leading cause of neonatal death was prematurity 51.3% followed by neonatal asphyxia 17.1%. Our results are consistent so that at different frequencies with those found in developed countries. In France, prematurity represented 26% of all causes of death in newborns in 2000 and 45% in the United States [12]. Our study also showed that 138 deaths occurred in the early neonatal period, i.e. a frequency of 87.34%. This observation was also made by other authors such as M. ONGOIBA OUMAR 82.5% in neonatal mortality at the CHU Hassan II of Fez in Ivory Coast [13]. Our result somewhat confirms the WHO estimates which say that each year four million newborns die in the first four weeks of life and two-thirds of neonatal mortality occurs in the first week of life [2].



## Conclusion

Newborns are faced with a demand for adaptation in their new living environment. Notable changes are noted by parents and/or caregivers, with the presence of many signs which, for some, reflect the state of health of the baby. These are very often warning signs in these little ones. To identify these signs, we started from the reasons for hospitalization through the factors related to the mother. Factors are indexed in the causes of state of emergency in the baby. These are maternal age, parity and infectious context during pregnancy and/or childbirth such as premature rupture of membranes greater than 12 hours (24%), prolonged labor (17.6%), the vaginal purulent (7.6%), fever during labor and/or delivery (23%) and dysuria (5%). The most disease states met were dominated by prematurity (34.8%), followed by neonatal infections (26.7%), neonatal asphyxia (20.7%), respiratory distress (7.1%), intrauterine growth retardation (6.2%), Anemia (3%), jaundice (0.9%) and gastrointestinal bleeding (0.6%). The warning signs found in newborns are: body temperature abnormalities (29.4%) with hypothermia and hyperthermia, small babies (23.1%), breathing difficulties (12.4%), lethargy (7.7%), convulsions (3%), feeding difficulties (5.7%), vomiting (3.2%), gastrointestinal bleeding (0.6%), diarrhea (1.1%), jaundice (%), cyanosis (10%), and pallor (3%). The case fatality rate is 33.3% and the main causes of death from neonatal medical emergencies are: prematurity (51.3%), neonatal asphyxia (17.1%), respiratory distress (12%), neonatal infections (10.7%) and anemia (5.1%). These deaths occurred in 87.34% of cases during the early neonatal period. Faced with these, it is important to say that the reduction of morbidity and therefore neonatal mortality must go through recognition of the warning signs by family members and a prompt reaction from those around the patient baby.

## Authors' Contribution

Bambi Ntumba Antoine is responsible for study design, data collection, data supervision, data analysis and interpretation and Kanku Mukala Gracia, Yand Tshiband Merveille, Tshishimbi Buashi Patric contributed to the design, supervision, analysis and interpretation of the data.

## Bibliography

1. WHO. The world health report 2005. "Let's give every mother and every child a chance" (2005).
2. WHO. "Pregnancy, Childbirth, Postpartum and Newborn Care: A Guide for essential practice. Geneva, Switzerland: WHO, Integrated Management of Pregnancy and Childbirth (IMPAC)". In: Giving Every Newborn Baby a Chance in Africa: Practical Evidence, Policy Support and Newborn Care Programs in Africa. Joy Lawn and Kate Kerber, eds Partnership for Maternal, Newborn and Child Health, CapeTown, 2006 (2003): 72.
3. Unicef. The State of the World's Children. Child Survival (2008).
4. Unicef.State of the World's Children 2006. "New York: United Nations Children's Fund". In: Give Africa's Every Newborn a Chance: Practical evidence, policy support and programs for newborn care in Africa.Joy Lawn and Kate Kerber, eds Partnership for Maternal, Newborn and Health infant, Cape Town, (2006).
5. Unicef. "Millenium Objectives for development".
6. H Tetto Tatnke., *et al.* "Epidemiological and clinical aspect of medical emergencies in neonatology in Mahajanga Madagascar". *Review of Anesthesia-Resuscitation and Emergency Medicine* 3.1 (2011): 27-31.
7. Bobossi Serengbe G., *et al.* "Neonatal morbidity and mortality at the pediatric complex of Bangui (CENTRAFRIQUE)". *Médecine d'Afrique Noire* 51.3 (2004): 159-163.
8. Azoumah KD., *et al.* "Neonatal morbidity and mortality at CHU Kara (TOGO)". *Médecine d'Afrique Noire* 57.2 (2010): 109-112.
9. LANSAC J. "Practice of childbirth, 4th edition". Elsevier Masson (2006): 553.
10. TRAORE B., *et al.* "Adolescent childbirth in the maternity ward of the Ségou Regional Hospital in Mali: obstetrical and neonatal prognosis". *Médecine d'Afrique Noire* 57.10 (2010): 449-454.
11. NYENGA MA., *et al.* "Profile and risk of mortality in premature infants at Sendwe/Lubumbashi hospital, RD Congo". *Rev. Ped. Congo River* 1 (2013).
12. World Health Organization (WHO), Aahman E., *et al.* "The global burden of disease, 2004 update". Geneva: WHO (2008): 153.

13. Mr. Ongoiba Oumar. "Neonatal mortality at CHU Hassan II in FES (retrospective study of 235 cases)". Thesis at Sidi Mohammed Ben Abdallah University. Year (2010): 152.
14. Lachassinne E. "Infectious problems". In: Francoual c, Huraux-Rendu c, Bouillie J. Pediatrics in maternity. Paris: Flammarion, Medicine-Sciences 47 (1999): 4-8.

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