

## Early Prognosis of Resuscitated Newborns in Kara (North Togo)

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Received: October 21, 2019; Published: December 30, 2019

### Abstract

**Introduction:** Well-managed neonatal resuscitation improves the prognosis of perinatal asphyxia. Purpose: To determine the immediate and short-term future of resuscitated infants in Kara.

**Patients and Methods:** This was an analytical and descriptive cross-sectional study from January 1<sup>st</sup> to May 31<sup>st</sup>, 2016 (5 months) in maternity and neonatal units (CHU, CHR and HME-SOS). The main parameters studied were sociodemographic data, maternal antecedents, the course of delivery, resuscitation and its evolution.

**Results:** The study involved 83 newborns, 79.5% of whom were born at term and 62.2% of whom were male. Mothers aged 27 years were illiterate in 19 cases (22.9%). The main factors associated with resuscitation were: maternal alcoholism (69.9%), maternal malaria (22.9%), acute fetal distress (63.6%), premature rupture of membranes (16.9%), amniotic fluid disorder (36.1%). The hospital stay lasted 13 days. The case fatality rate was 16.9%.

**Conclusion:** Resuscitation in a multidisciplinary team would reduce neonatal morbidity and mortality.

**Keywords:** Neonatal Asphyxia; Resuscitation; Newborn; Mortality; Togo

### Introduction

The adaptation of the newborn to the ectopic life is the set of changes the newborn undergoes at birth.

While this adaptation is going well for most newborns, there are 5 - 10% of them that require specific interventions [1-3]. These specific interventions required can range from simple tactile stimulation to complex cardiopulmonary resuscitation for 1% of newborns [2]. Reducing short- and long-term mortality and neurological conditions associated with asphyxia at birth is the main objective of optimal neonatal resuscitation [3]. The essential role of pulmonary aeration justifies the importance of effective alveolar ventilation in the mask or tube, which is often enough to rapidly improve the circulatory condition [2]. When it is delayed, the circulatory assistance by external cardiac massage associated with the administration of adrenaline through the tracheal system helps to restore a hemodynamic state to ensure an infusion and therefore brain oxygenation. Essential factor in subsequent brain prognosis [4]. Careful monitoring remains necessary after initial resuscitation due to the risk of secondary aggravation [2].

Africa has the highest estimated neonatal mortality rate of 45 deaths per 1,000 live births compared to 34 in Asia, 17 in Latin America and 5 in developed countries [5,6].

In Togo, the neonatal mortality rate was 27 per 1,000 live births in 2013 without any details on the proportion of asphyxia in the birthing birth despite their high number [7]. While there are studies that have assessed the availability of resuscitation equipment and the competence of staff in the country's referral centres, none have really focused on the fate of infants who have experienced asphyxiation [8,9]. It is therefore to enrich the literature that we undertook this study in order to determine the immediate and short-term future of newborns resuscitated in three reference centres of the Kara's municipality located 400 kilometers from the capital, Lomé.

### Patients and Methods

Our study was based on the maternity and neonatology units of the Kara University Hospital Centre (CHU-K), the Kara Regional Hospital Centre (CHR-K), and the Mother Child Hospital Social Works Service (HME/SOS) Kara. These centres were chosen because they are the main reference centres in Kara's city.

This was a descriptive cross-sectional study that ran from January 1 to May 31, 2016 (5 months) of newborns resuscitated at birth in the 3 study centres. Newborns born at home and those who had a surgical emergency were excluded from this study. We had done an accidental non-probabilistic sampling. A pre-established fact sheet allowed us to collect socio-demographic data (mother's age, education level, marital status, and child's sex), pathological history, lifestyle and eating habits, pregnancy monitoring and unfolding, delivery, and resuscitation in the birthing room and neonatology unit. We did a manual data count. From an ethical and administrative point of office, we had requested and obtained prior authorization from hospital administrations, as well as the verbal informed consent of the mothers of these newborns while respecting confidentiality.

### Results

#### Socio-demographic characteristics of mothers

Our study involved 83 mothers and their children.

The average age of the mothers was  $27 \pm 5.47$  years with extremes of 16 and 38 years. One mother was under 18 years of age (16 years), 68 mothers (81.9%) were between the age of 18 and 35, and 14 mothers (16.8%) were 35 years of age or older.

Mothers were illiterate in 19 cases (22.9%). They had a primary education in 40 cases (48.2%), secondary in 21 cases (25.3%), and higher level in 3 cases (3.6%). They were married in 69 cases (83.1%), cohabiting in 10 cases (12%), divorced in 2 cases (2.4%) and singles in 2 cases (2.4%).

#### Mothers' history

The medical pathologies present during pregnancy were malaria (19 cases; 22.9%), urinary tract infection (8 cases; 9.6%), genital fungus (5 cases; 6%), anemia (4 cases; 4.8%), high blood pressure with the concept of pre-eclampsia (3 cases; 3.6%), human immunodeficiency virus infection (HIV) (3 cases; 3.6%), syphilis (2 cases; 2.4%), toxoplasmosis (1 case; 1.2%), hepatitis B (1 case; 1.2%), heart disease (1 case; 1.2%), diabetes (1 case; 1.2%).

The average gestity was  $2.9 \pm 1.8$  with extremes of 1 and 11 gestures. Mothers were primigestes in 20 cases (24%). The average parity was  $2.6 \pm 1.6$  with extremes of 1 and 8 deliveries. Mothers were nullipares in 21 cases (25.3%). A history of spontaneous abortion was found in 8 cases (9.6%). The shrunken basin was found in 4 cases (4.8%) and a small size in one case (1.2%). A threat of preterm birth was found in 10 cases (12%).

For pregnancy follow-up, refocused prenatal consultations (RPNCs) were performed by all 83 mothers. The average number of RPNCs performed was  $3.4 \pm 1.2$  with extremes of 1 and 6. Forty-one mothers (49.4%) had done at least 4 CPNs. The medical staff who followed the pregnancy were a gynaecologist-obstetrician (3 cases; 3.6%), a midwife (62 cases, 74.7%), an auxiliary birth attendant (17 cases; 20.5%). The average gestational age was  $37.6 \pm 3.4$  weeks of amenorrhoea (AW) with extremes of 28 and 43 AW. Prematurity was found in 17 cases (20.5%) with a gestational age of between 28 and 32 SA plus 6 days (large prematurity) in 11 cases (13.2%), between 33 and 34 SA plus 6 days (average prematurity) in 3 cases (3.6%), between 35 and 36 SA plus 6 days (small prematurity) in 3 cases (3.6%). Pregnancy was terminated, between 37 and 42 SA, in 65 cases (78.3%).

As for eating habits and lifestyle, only one woman was a tobacco natto. Consumption of traditional beer (toukoutchou) was found in 58 cases with varying daily quantities: 500 ml (a gourd) in 34 cases (41%), and 1000 to 1500 ml in 24 cases (28.9%).

### How the birth unfolded

Premature rupture of membranes was found in 14 cases (16.9%) with an average duration of  $9, 9 \pm 6.8$  hours, and extremes of 1 and 24 hours. Premature rupture of the membranes lasted more than 12 hours in 4 cases (4.8%). Birth labour was spontaneous in 78 cases (94%) and caused in 5 cases (6%). The accuracy of the duration of labour was reported in 61 cases (73.5%). The average duration of labour was  $12.9 \pm 11.8$  hours with extremes of 1 and 72 hours. The labor of delivery lasted less than 6 hours in 7 cases (8.4%), 6 to 12 hours in 39 cases (47%), and more than 12 hours in 15 cases (44.6%).

In pre-partum, oxytocin was used in 58 cases (69.9%), glucose serum 10% or 5% in 8 cases (9.6%) and Butyl in 6 cases (7.2%). General anesthesia products were used in 5 cases (6.0%), and in 2 cases (2.4%) diazepam was used. As part of the prevention of mother-to-child transmission of HIV, an association of antiretrovirals was used (Lamivudine, Zidovudine, Efavirenz) for the three mothers with HIV-positive serology.

Delivery was performed vaginally in 50 cases (60.2%), and by caesarean section under spinal anesthesia in 33 cases (39.8%), and 5 cases required additional general anesthesia. Forceps was used in 3 cases (3.6%): one case during caesarean section and two cases during vaginal delivery. The indication of caesarean section was acute fetal suffering in 21 cases (63.6%): 12 related to fetal-pelvic disproportion, severe oligoamnios in 6 cases (21.2%), hydramnios in 4 cases (12.1%), pre-eclampsia in 2 cases (6%).

Of the 12 cases of fetal-pelvic disproportion, macrosomis was present in 8 cases and one pelvis narrowed in a 4 cases. The amniotic fluid was meconial (30 cases; 36.1%), pea puree (8 cases; 9.6%), fetid (4 cases; 4.8%) and clear (38 cases; 45.8%). The umbilical cord had a circular appearance in 15 cases (18%).

### Characteristics of newborns at birth

We recorded 83 newborns, 50 of whom were male (60.2%). The sex ratio was 1.5.

For anthropometric parameters, the average weight was  $2777.7 \pm 700$  grams (g) with extremes of 1200 and 4500 g. A low birth weight was found in 19 cases with a weight between 1200 and 1499 g in 6 cases (7.2%), and between 1500 and 2499g in 13 cases (15.7%). Weight was normal, between 2500 and 3499g in 56 cases (67.5%). Excessive birth weight, between 3500 and 4500 g, was found in 8 cases (9.6%). The birth size averaged  $48.6 \pm 3.5$  centimeters (cm) with extremes of 35 and 52 cm. The size was less than 48 cm in 11 cases (13.3%). The average body mass index (BMI) was 11.66 kilograms per square meter ( $\text{kg}/\text{m}^2$ ) with extremes of 5.4 and 18.9  $\text{kg}/\text{m}^2$ . The average cranial perimeter was  $33.5 \pm 2$  centimeters (cm) with extremes of 27 and 36 cm. The cranial perimeter was less than 32 cm in 10 cases (12%). The average chest girth was 33.5 to 1.8 cm with extremes of 26 and 36 cm.

Apgar's score was between 0 and 6 in one, five and 10 minutes respectively in 83 cases (100%), 34 cases (40.1%) and 9 cases (10.8%).

About constants, hypothermia was found in 24 newborns (28.9%), and hyperthermia in 15 newborns (18.1%). Temperatures ranged from 36.5 to 37.5 degrees Celsius in 44 cases (53%). Perinatal asphyxia had signs of respiratory control in 17 cases (20.5%) two (2.4%) with an inhalation of meconial amniotic fluid. The average respiratory rate was  $26.3 \pm 9.3$  cycles per minute with extremes of 14 and 82 cycles per minute. Bradypnea (respiratory frequency less than 30 cycles per minute) was found in 63 cases (75.9%), and tachypnea (respiratory frequency greater than 60 cycles per minute) in 2 cases (2.4%). Respiratory frequency was normal (between 30 and 60 cycles per minute) in 18 cases (21.7%). The average heart rate was  $83.6 \pm 19.3$  beats per minute with extremes of 30 and 100 beats per minute. Bradycardia (heart rate less than 100 beats per minute) was found in all cases (100.0%) with a heart rate of less than 60 beats per minute in 13 cases (15.7%), between 60 and 80 in 20 cases (24%), between 80 and 100 in 42 cases (50.6%).

**Resuscitation in the birthing room and in pediatrics**

All 83 newborns were resuscitated in the birth room with various means depending on the care centres. Twenty-three newborns were transferred from peripheral care units or medical-social centres to the three centres: CHU (10 cases), CHR (9 cases) and MCH/SOS (4 cases). In 60 cases, the transfer was done internally from maternity units to the neonatology unit in each centre: CHU (19 cases), CHR (29 cases), HME/SO (12 cases). The main means used in the birthing room in the three hospitals were drying and stimulation (60 cases; 72.3%), aspiration (76 cases; 91.6%), mask ventilation (65 cases; 78.3%), and external cardiac massage (47 cases; 56.6%) (Table 1). The average duration of resuscitation in the birth room was  $10.9 \pm 3.6$  minutes with extremes of 5 and 20 minutes.

*Table 1: Distribution of resuscitated infants according to the means used in the hospital.*

	CHU		CHR		HME/SOS	
	Maternity	Pediatrics	Maternity	Pediatrics	Maternity	Pediatrics
Drying and stimulation	19	0	29	0	12	0
Aspiration	16	18	29	7	12	4
Ventilation to the mask	15	11	27	0	13	0
Oxygenation with glasses	3	13	26	14	2	5
External cardiac massage	9	4	35	1	3	
Intubation	0	0	3	2	0	0
Griddle	12	10	15	15	9	5
Antibiotic therapy	0	24	0	30	0	16

**Immediate becoming of resuscitated newborns**

In the immediate future, out of 60 newborns resuscitated internally in the maternity wards of each centre, 4 (6.7%) had died in the birth room, 30 (50%) were unstable, and 26 (43.3%) had a stable condition. The 23 newborns evacuated from other care facilities were in an unstable condition.

**Becoming newborns resuscitated after the twenty-fourth hour of life**

In the first 24 hours of life, of the 79 newborns admitted to neonatology, 10 (12.7%) had died, 13 (16.5%) were unstable and 56 (70.9%) had a stable condition.

Between the second and seventh days, of the 69 infants who remained alive, 66 had a stable condition, and 3 had an unstable condition.

In terms of exit, of the 83 newborns, 14 had died, representing a hospital neonatal lethality rate of 168.7 per 1000 live births. There were 59 cases (71.1%) cure, 8 cases (9.6%) release on demand and 2 cases (2.4%) runaway.

### Discussion

This study in the three reference centres of Kara's municipality allowed us to obtain a sample of sufficient size for the analysis and interpretation of data on resuscitated newborns.

Primiparity (24%) was identified as one of the risk factors for neonatal suffering in our study, as was the case with data from some authors [10-12]. Young (under 20 years) or advanced maternal age (over 35 years) associated with primiparity are the risk of neonatal mortality [11-13]. The primiparous in our study had an advanced age, beyond 35 years, in 14 cases. These conditions could increase the risk of newborns being resuscitated.

No link was established between the gestity and condition of newborns at birth contrary to what was reported by Kazanda Buanga in its study on the difficulty of managing twin pregnancy in African settings [14]. Similarly, the mother's education level and marital status did not influence the condition of newborns at birth.

RPNCs are ideal moments for activities to prevent perishing and neonatal complications. In our study, almost one in two women (50.6%) had not achieved the four WHO-recommended NCPs [15]. These missed opportunities would partly explain the high incidence of neonatal suffering that we observed.

Fetal monitoring during labour diagnosed 21 cases of acute fetal suffering based on clinical evidence such as fetal heart noise testing, amniotic fluid appearance and frequency of uterine contractions. Despite this monitoring, the number of resuscitated infants remains high, hence the interest of preparing for optimal delivery even if labour seems normal [16].

In our study, the low delivery pathway was the predominant route of delivery but also a risk factor for neonatal death. This pathway appears to be at greater risk of dystocia, a source of intrauterine hypoxia and asphyxiation at birth and therefore death if adequate neonatal resuscitation care is not applied. It is in this context that the use of the partogram in the monitoring of childbirth derives all its interest. It not only detects abnormalities in the progression of delivery's labor, but also alerts the obstetric team to a prompt decision such as a caesarean section in order to extract the fetus from suffering and anticipate neonatal resuscitation. The most common indication of caesarean section in our study was acute fetal suffering in 21 cases (63.6%). Our results are similar to MINKO's who reported 61.95% in Gabon [16]. In 14.5% of the caesarean sections, it was a certainly little-known foeto-pelviene disproportion that had been complicated by fetal suffering. This finding reveals the value of ultrasound and especially the evaluation of the prognosis of delivery in the third trimester during RPNCs in order to reduce the occurrence of dystocic deliveries.

Timely caesarean section appeared to be a protective factor of neonatal death in our study.

The subsidy for quality emergency obstetric and neonatal care, making health services more accessible to the majority of populations in developing countries, has contributed to the steady decline in maternal and neonatal mortality [17].

Prematurity was found in 20.5% of cases. This rate is half the rate compared to 40.13% of Bobossi Serengbe., *et al* [18]. Analysis of the results did not link prematurity to resuscitation.

Apgar's score is used to diagnose perinatal asphyxia and determine the life expectancy of newborns. Low Apgar scores at the fifth and tenth minute have correlations with long-term health status. However, Apgar's score should no longer be used to decide whether to perform resuscitation or not [5]. Rather, it is the respect of the golden minute that is indispensable and which evaluates the newborn only on the basis of the presence of the first cry or not, the only determining criterion to begin resuscitation [19,20].

The duration of resuscitation varied depending on the initial condition of the newborns. But Apgar's poor score in the fifth minute of life was a factor in our poor prognosis in our series like the one reported in Bangui [18].

Resuscitation was effective in 83.1% of cases. This rate is similar to that found in Brazzaville which is 80.45% [7]. This result is much better in developed countries because of the better technical platform.

The frequency of respiratory distress of 20.5% gets is close to that of Lasme, *et al.* which is 23.4% [21]. Respiratory distress may then be attributed in part as a risk factor for resuscitation.

The lethality was 168.7 per 1000 live births was 16.9%. This high lethality could be explained on the one hand by the quality of RPNCs and on the other hand by the transfers of newborns from one centre to another often unsuitable. In fact, 50.6% of mothers had not performed the minimum 4 RPNCs according to WHO recommendations. As for the transfer, they are often carried out by the parents themselves without being accompanied by medical staff with inadequate means of transport exposing the already fragile newborn to more complications that can explained some deaths [22].

### Conclusion

The results of this research clearly show that neonatal mortality remains high without a specific factor. Nevertheless, neonatal asphyxia could be highlighted as one of the main determinants. These factors should therefore be examined more systematically.

### Bibliography

1. Wall SN., *et al.* "Neonatal resuscitation in low-resource settings: what, who, and how to overcome challenges to scale up?" *International Journal of Gynecology and Obstetrics* 107.1 (2009): 47-64.
2. Perlman JM., *et al.* "Cardiopulmonary resuscitation in the delivery room: associated clinical events". *Archives de Pédiatrie* 149.1 (1995): 20-25.
3. Barber CA., *et al.* "Use and efficacy of endotracheal versus intravenous epinephrine during neonatal cardiopulmonary resuscitation in the delivery room". *Pediatrics* 118.3 (2006): 1028-1034.
4. Lee AC., *et al.* "Neonatal resuscitation and immediate newborn assessment and stimulation for the prevention of neonatal deaths: a systematic review, meta-analysis and Delphi estimation of mortality effect". *BMC Public Health* 11.3 (2011): S12.
5. Oluwole Akande E. "Un destin inséparable du nouveau-né, de la mère et de l'enfant". [Auteur du livre] éd. Joy Lawn et Kate Kerber. Donnons sa chance à chaque nouveau-né de l'Afrique. Cape Town: Partenariat pour la Santé maternelle, néonatale et infantile (2006).
6. Ersdal LH., *et al.* "Early initiation of basic resuscitation interventions including face mask ventilation may reduce birth asphyxia related mortality in low-income countries". *Resuscitation* 83.7 (2011): 869-873.
7. Ministère de la Planification, du Développement et de l'Aménagement du Territoire (MPDAT), Ministère de la Santé (MS) et ICF International. Enquête Démographique et de Santé au Togo 2013-2014. Maryland, USA: MPDAT, MS et ICF International (2015).
8. Azoumah KD., *et al.* "Évaluation des ressources humaines et matérielles pour la réanimation du nouveau-né à la naissance dans les hôpitaux publics de référence du Togo". *Journal de Pédiatrie et de Puériculture* 22.7-8 (2009): 346-353.
9. Tchagbele OB., *et al.* "Compétences des prestataires de soins exerçant dans les maternités en matière de Réanimation néonatale au Togo". *Revue de Médecine Périnatale* 7.4 (2015): 245-253.

10. Andriamady RCL., *et al.* "Les accouchements dystociques à la maternité de Bafelanatanana: CHU d'Antananarivo, à propos de 919 cas". *Médecine d'Afrique Noire* 47.11 (2000): 456-459.
11. Tebeu PM., *et al.* "Primiparité âgé: du concept à la définition d'une méthode de détermination". *Médecine d'Afrique Noire* 55.8-9 (2008): 459-463.
12. El Farouqi A., *et al.* "Facteurs pronostiques de l'accouchement en présentation de siège. A propos de 674 cas". *Médecine du Maghreb* 170 (2009): 39-45.
13. Assimadi K., *et al.* "Morbidity and Mortality at the Unit of Premature Babies at the CHU of Lomé". *Revue Médicale de la Côte d'Ivoire* 57 (1985): 25-31.
14. Buanga Kazanda J. "Difficulté de prise en charge de la grossesse et de l'accouchement gémellaire en milieu africain". *Médecine d'Afrique Noire* (2000): 262-265.
15. OMS, Santé de la mère, du nouveau-né, de l'enfant et de l'adolescent, Programme Santé Maternelle et maternité sans risque. Stratégie Mondiale pour la Santé de la Femme (2016): 89.
16. Minko JL., *et al.* "La souffrance fœtale aiguë: expérience du service de néonatalogie du centre hospitalier de Libreville-Gabon". *Médecine d'Afrique Noire* 4.11 (2004): 227-230.
17. Balaka B., *et al.* "Impact de la césarienne subventionnée sur l'asphyxie périnatale à l'hôpital de district de Bè". *Journal de Recherche Scientifique de l'Université de Lomé (Togo)* 17.2 (2015): 337-343.
18. Bobossi Serengbe G., *et al.* "La réanimation néonatale en milieu pédiatrique à l'hôpital communautaire de Bangui (Centrafrique): Aspects épidémiologiques, indications et prise en charge". *Revue Internationale des Sciences Médicales* 4.1 (2002): 89-95.
19. Ersdal LH., *et al.* "Helping Babies Breathe (HBB) Training Is Associated with Reduced Early Neonatal Mortality (ENM) This Positive Benefit Is Reduced Due to Late Deaths (LD)". Conference abstract (2003).
20. American Academy of Pediatrics. "Guide for Implementation of Helping Babies Breathe (HBB): Strengthening neonatal resuscitation in sustainable programs of essential newborn care". Elk Grove Village, IL (2011).
21. Lasmé E., *et al.* "les facteurs de risque de détresse respiratoire néonatale en milieu hospitalier à Abidjan". *Annales de Pédiatrie* 44.9 (1997): 635-639.
22. Faye PM., *et al.* "Problématique des transferts néonataux dans la région de Dakar". *Revue de Médecine Périnatale* 8.2 (2016): 94-102.

**Volume 9 Issue 1 January 2020**

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