



## Research Article

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## Birth asphyxia in fullterm neonates in n'djamena mother and child hospital (Chad)

Gabkika BM<sup>1</sup>, Souam NS<sup>2</sup>, Adrienne N<sup>2</sup>, Yannick A<sup>2</sup>

<sup>1</sup> Department of Gynaecology and Obstetrics, N'Djamena Mother and Child Hospital, Chad.

<sup>2</sup> Department of Paediatrics, N'Djamena Mother and Child Hospital, Chad.

### Abstract

**Background:** Birth asphyxia is a serious problem which can cause 1 million deaths among newborn babies annually around the world and a similar number of patient with serious neurological sequelae, such as cerebral palsy, mentard retardation and epilepsy. **Objective:** determine the antepartum, intra partum and fetal risk factors of brith asphyxia and it outcome in N'Djamena Mother and Child hospital. **Patient and Method:** This was a cross-sectional study covering the six months from June, 1<sup>st</sup> of june 2016 to the November 31<sup>st</sup>of November 2016. The study group was constituted with full term newborn (gestational age 37-42weeks) presenting asphyxia. The control group where each newborn delivered after baby suffering with asphyxia were recorded. **Results:** During the study period, 371 newborns have presented an asphyxia among 7,254 newborns giving an incidence of birth asphyxia was 05,1%. The maternal risk factors were: primiparity, and young maternal age. The delivery were mostly in vagina mode in the both group (53.1% in the study group vs 76.6 in the control group). More caesarean section was performed in the study group (29.4% vs 13.2%). Mains etiologies of birth asphyxia were: obstructed labour(18.3%), spontaneous premature rupture of membranes (17.2%), ocytocyn drug use (15.1%), hypertension/ preeclamsia/ eclampsia (10.2%). Most of neonates in the control group had cried immediately after birth, and only 5.1% of them needed simple resuscitation and responds to direct oxygen. while 68.2% of cases suction, oxygen or bag and mask. The letality rate was greatter in the study group (11.3% vs à.5%). **Conclusion:** Birth asphyxia remains a serious public health problem. Risks factors are known. The majorité of these factors may be manageable by means of goods prenatal care.

**Keywords:** birth asphyxia, etiology, N'Djamena mother and child hospital-Chad.

### INTRODUCTION

Birth asphyxia is a serious problem which can cause 1 million deaths among newborn babies annually around the world and a similar number of patients with serious neurological sequelae, such as cerebral palsy, mental retardation and epilepsy [1]. Birth asphyxia occurs when baby experiences a lack of oxygen to his or her brain during or near the time of birth [1]. WHO' reports showed that 4 millions deaths yearly recorded due to birth asphyxia representing 38% of all deaths of children under 5 years. In developing countries 23% of all neonatal death occurred due to birth asphyxia [2, 3]. Birth asphyxia results from an inadequate intake of oxygen by the baby during the birth process or just after birth [3]. Decreased oxygen intake can result in chemical changes in the baby's body that include hypoxemia, or low level of oxygen in the bloode, and acidosis, in which too much acid builds up the blood [3, 4]. This cascade of biochemical changes inside the body, whose event can lead to neuronal cell death and brain damage. Continious asphyxia will also lead to multiple organ systems dysfunction [4]. Birth asphyxia is a serious clinical problem worldwide and contributes greatly to neonatal mortality and morbidity.

In Chad there is not much studies available on the risk factors of birht asphyxia. Our main goal was to determine the antepartum, intra partum and fetal risk factors of birth asphyxia and its outcome in N'Djamena Mother and child hospital.

### PATIENTS AND METHOD

This was a cross-sectional study covering the six months from June, 1<sup>st</sup> of june 2016 to the November 31<sup>st</sup>of November 2016. Our sample consisted of two groups:The study group constituted with full term neonates (gestational age 37-42weeks) presenting asphyxia. The control group were each newborn delivered after baby suffering with asphyxia were recorded. In order to contrôle the delivery condition, all newborns coming from surrounding hospital with fetal asphixia were not included.

\*Corresponding author:

Gabkika BM

Department of Gynaecology and Obstetrics, N'Djamena Mother and Child Hospital, Chad.

Email: kickbray[@yahoo.fr

Studied variables were: maternal parity, prenatal care, antenatal maternal diseases, mode of delivery, Apgar score and the management.

## RESULTS

Out of 7,254 deliveries during the study period, 371 newborns have presented an asphyxia. So the incidence of birth asphyxia was 05,1%.

### Maternal characteristics

**Table 1:** Maternal characteristics

Maternal characteristics	Study group (n=371)	Control group (n=371)	P value
Maternal age (years):	18.3 ± 3.4	24.7 ± 4.1	
Mean range	14-43	19-44	
Mean parity	1.5 ± 2.8	3.3 ± 1.7	0.01
referred	48.2%	14.3%	
Gestational age at delivery (weeks):	39.7 ± 2.5	37.9 ± 2.9	
Mean range	37- 40	37- 42	
regular prenatal cares	158 (42.6%)	307 (82.7%)	0.0001

The mean maternal age and mean birth parity of the study group was significantly lower than the control group. There were more mothers referred in the study group than in the control group

### The characteristics of labor and delivery

**Table 2:** Mode of delivery

Mode of Delivery	Spontaneous vaginal n(%)	Caesarean section n(%)	Operative vaginal n(%)	Total n(%)
asphyxia (study group)	197 (53.1)	109 (29.4)	65 (17.5)	371(100)
Control group	284 (76.6)	49 (13.2)	38 (10.2)	371(100)

Table 2 shows that 29.4% of newborns in the study group were delivered by caesarean versus 13.2 % in the control group.

Operative vaginal are delivery done in vaginal route using episiotomy.

### Etiologies of birth asphyxia

**Table 3:** Etiologies of birth asphyxia

Etiologies of birth asphyxia	Study group (n=371) n (%)	Control group (n=371) N (%)	P value
Oxytocyn drug use	56 (15.1%)	23 (6.2%)	0.002
Spontaneous premature rupture of membranes	64(17.2%)	35(9.4%)	0.003
Antepartum hemorrhage	35(9.4%)	45(12.1%)	
Diabetis millitus	6(1.6%)	10(2.7%)	
Anemia	14 (3.7%)	35 (9.4%)	
Hypertension/ preeclamsia/ eclampsia	38(10.2%)	26(7%)	
Obstructed labour	68(18.3%)	41(11.3%)	0.000

The main etiologies of birth asphyxia were: obstructed labour (18.3%), sponatneous premature rupture of membranes (17.2%), oxytocin use (15.1%) hypertension/preeclampsia/ eclampsia (10.2%)– see Table 3.

### Early clinical features and birth asphyxia

**Table 4 :** Early clinical features and birth asphyxia

Early clinical features and birth asphyxia	Study group	Control group
<i>Apgar score 1<sup>st</sup> minute</i>		
(≤ 3)	126 (6.9%)	00
4-7	245 (66%)	30 (8.1%)
<i>Apgar score 5<sup>th</sup> minute</i>		
(≤ 3)	53 (0.7%)	0
4-7	179 (1.2%)	0
<i>Apgar score 10<sup>th</sup> minute</i>		
(≤ 3)	19 (5.1%)	0
4-7	78 (21%)	0
<i>Cried immediately</i>		341 (91.9%)
<i>Resuscitation</i>		
<i>Suction, oxygen, or both</i>	197 (53.1%)	19 (5.1%)
<i>Bag &amp; mask, oxygen</i>	56 (15.1%)	4 (1%)
<i>Newborn death</i>	41 (11.3%)	2 (0.5%)

The early clinical features that were selected for diagnosis of birth asphyxia were assessed in Table 4 which shows that most of neonates in the control group had cried immediately after birth, and only 5.1% of them needed simple resuscitation and responds to direct oxygen. while 68.2% of cases suction, oxygen or bag and mask. The letality rate was greater in the study group (11.3% vs à.5%)

## DISCUSSION

Birth asphyxia and hypoxic ischemic encephalopathy (HIE) are serious conditions that can cause significant mortality and life-long morbidity in the newborn baby [5]. Our study shows that the prevalence of birth asphyxia in term babies in relation to the total term deliveries is 05.1% and 4.9%.Our finding is relatively higher as compared with those reported in studies done in pakistan [6], and Canada [7] ranging between 0.2% to 0.5%. Our higher figures could be attributed first to prenatal factors as 57.4% of mothers do not have regular antenatal care and secundo to admission mode(48.2% of mothers were referred). These situations delay adequate management and allow the occurrence of complication during delivery which are represented mainly by fetal sphyxia.

Previous studies had reported that young maternal age ( 18-25 years) and primigravidity are main risk factors of developing birth asphyxia [8, 9, 10]. Theses assertion were confirmed in this study. Younger age mothers remain a high risk group due to factors which are more common among them such as biologic immaturity, inadequate prenatal care, and low pre pregnancy weight, all these factors may influence the outcome of pregnancy [11]. Also this study shows that birth asphyxia is more among babies delivered to primigravida. This could be explained by that there is a higher chances of cephalo-pelvic disproportion and prolonged labour [11].

Our study had showed that most of cases in both group had delivered by normal vaginal delivery this was similar with finding of Ala [6] and Nayeri [9]. In the study group, 29.4% of mothers had delivered by caesarien section. This propotion of caesaran can be explain by the fact that it aims to save the fetus. In some condition when, the fetal asphyxia is diagnose the caesarean remains the only solution to save quickly the fetus.

This study shows a statistically significant association between asphyxia and complication of labour (like prolonged rupture of membrane,

prolonged labour), the use of oxytocin and hypertension/ pre-eclampsia/eclampsia, which is similar to the studies done by previous authors [6, 11, 12, 13]. This is because labour complications are risk factors for interruption of umbilical blood flow during labour.

Recommendations for neonatal resuscitation are provided, for instance, by the Neonatal Resuscitation Program prepared by the American Heart Association [14]. Briefly, the baby is quickly assessed in terms of gestational age, whether or not it is breathing, and muscle tone. Preliminary steps include providing warmth, drying, clearing the airway, and stimulating. Further assessments are based on heart rate and pulse oximetry. Interventions include positive-pressure ventilation, chest compressions, endotracheal intubation, and intravenous adrenaline [14, 15]. The protocol recommends that resuscitation should begin with room air, and 100 % O<sub>2</sub> should be used only after prolonged hypoxemia or bradycardia [14, 15]. Resuscitation with 100 % O<sub>2</sub> has been shown to depress ventilation and is associated with adverse outcome in babies and animal models [16]. Implementation of the Neonatal Resuscitation Program in developing countries has been particularly challenging [17]. In this study, resuscitation using warm, drying, clearing the airway, and stimulating and oxygen was performed. This management is linked with some technical problems that can not allow the implementation of the above recommendations

## CONCLUSION

Birth asphyxia remains a serious public health problem. Risks factors are known. The majority of these risk factor may be avoidable if prenatal cares are correctly done. When diagnose is done the best way to treat birth asphyxia is to follow recent recommendations even if the implementation of some step is difficult in developing country. According to this study one can that the best way to reduce the birth asphyxia is a good prenatal cares, and a good surveillance of patient in delivery room

## Authors approval

All authors approve the submission of this work.

## Conflict of interest

All authors have declared that there is no conflict of interest.

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