



## Panorama of Visible Birth Defects in Eastern Democratic Republic of Congo (Drc) During the War Péroide

### KEYWORDS

malformations, birth, eastern DRC, war period.

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**ABSTRACT** *Introduction: Malformations have always had an embarrassing curiosity for men. While in developed countries the incidence of these malformations is well known, it is not the same in our country.*

*Objective: To analyze the visible birth defects.*

*Material and Methods: This study, prospective, multicenter; study period: May 2012 to April 2013 in 4 hospitals in Eastern DRC. We collected 11,500 deliveries with 89 malformed. The data were processed and analyzed using Excel 2010 software Epi Info version 7.01.*

*Results: In 11,500 registered births, 89 newborns were malformed (0.77% of cases) with 44 boys, 42 girls and 3 hermaphrodites. South Kivu: 56 malformed births in 6316 (0.89%) and 33 out of 5184 in North Kivu (0.64%) with no significant difference between the two provinces. 4 health facilities showed a significant difference with a clear predominance for Ciriri (1.1%). Musculoskeletal defects were the most encountered (35.5%) and the nervous system and neural tube defects (30.8%).*

*Conclusion: The apparent birth defects are a reality in eastern DRC. Both provinces are affected in the same way with predominance Ciriri (SK) among the 4 structures. Malformations of the musculoskeletal system are most observed. A thorough study will help to understand the causative and predisposing factors.*

### INTRODUCTION

Congenital malformations have always had an embarrassing curiosity for men and his surroundings across all the civilizations [1]. While in developed countries the incidence of these malformations is well known and much progress is made in the prenatal diagnosis [2] and into the health care support, it is not the same in African countries like Democratic Republic of the Congo.

In Sub Saharan Africa, very few studies have been devoted to the study of birth defects [3, 4, 5]. It is the same case in the Democratic Republic of Congo (DRC), where there are only few studies made in this field [6].

The purpose of this study was to analyze all birth defects visible at birth in order to know their incidence and types in a region with recurring wars in Eastern part of the DRC.

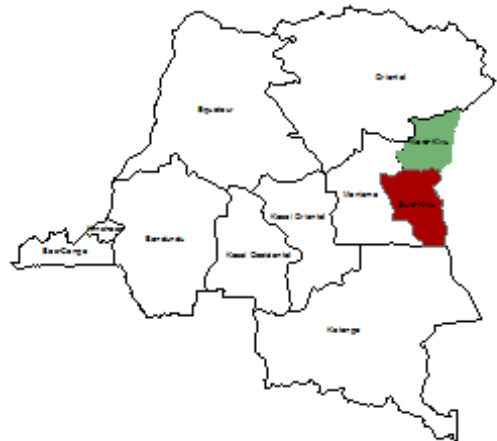
### MATERIALS AND METHODS

#### Areas of Study

#### - Provinces of study:

This work was carried out in four health facilities in two provinces in East of the DRC: North Kivu (NK) and South Kivu (SK) (Map 1).

Bukavu is the Capital City of South Kivu with an area of 65,070 km<sup>2</sup> and an estimated population of 4,339,014 inhabitants, whereas North Kivu has Goma as Capital City with an area of 59,483 km<sup>2</sup> and a population of 5,361, 316 inhabitants.



#### - Hospitals:

We conducted a prospective multicenter study in four hospitals located in north-eastern DRC: General Reference Hospital (GRH) of PANZI and HGR Ciriri in South Kivu, HGR of Oicha and Health Centre of Reference MANGINA in North Kivu.

#### Methods:

This is a prospective study which took place from May 2012 to April 2013 is for one year. Our study protocol included briefly: number of births, sex (male, female and sexual ambiguity) malformed, malformations encountered and their types after checking by the midwife and doctor's

clinical examination in charge of maternity.

We have then compiled 11,500 deliveries and counted 89 newborns with visible congenital malformations including 16 newborns with two or more than two birth defects in combination. We called apparent malformations defects identifiable by simple inspection [1]. Malformations were grouped by body system according to the 10th version of the classification of diseases according to the World Health Organization (WHO) [7].

Data analysis was done using the software Excel 2010 and Epi Info 7.01. X<sup>2</sup> and Fisher's test were used for comparing the frequency and a p-value ≤ 0.05 was considered significant.

**RESULTS**

**1. Study of the prevalence, gender and malformations per site**

**Table 1: Frequency, gender and malformations by site**

Province d'étude	Deliveries nb= 89	Malformations %	%	Gender
South Kivu (Ciriri et Panzi)	6316	56	0.89	Masculin
	44	49.44		
North Kivu (Mangina et Oicha)	5184	33	0.64	Féminin
	42	47.19		
<b>Total</b>	<b>11500</b>	<b>89</b>	<b>0.77</b>	<b>Hermaphrodisme</b>
	3	3.37		
X <sup>2</sup> cal = 2,284    X <sup>2</sup> tab = 3,841    dl=2    Threshold = 0,05.				
<b>Hospital</b>				
Ciriri	3015	34	1.13	
Panzi	3301	22	0.67	
Mangina	1807	17	0.94	
Oicha	3377	16	0.47	
<b>Total</b>	<b>11500</b>	<b>89</b>	<b>0.77</b>	
X <sup>2</sup> cal = 9,867    X <sup>2</sup> tab = 7,817    dl= 3    Threshold = 0,05.				

About 11,500 births, there were 89 newborns malformed or 0.77% of incidence rates. However, these proportions do not show a significant difference between the two provinces.

On 11,500 births, we have respectably found 1.13%, 0.94%, 0.67%, 0.47% to Ciriri, Mangina Panzi Oicha. These proportions have a statistically significant difference.

South Kivu has either recorded 6,316 deliveries including 56 newborns malformed, or an incidence of 0.89%, whereas the North Kivu has either recorded 5184 deliveries including 33 newborns malformed or incidence of 0.64%.

44 newborns malformed or 49.4% are male 42 against 47.4% female. However, three newborns or 3.37% have ambiguous genitalia or 'hermaphroditism'.

**2. Detailed study of congenital malformations encountered**

**Table 2: Affected systems and types of defects**

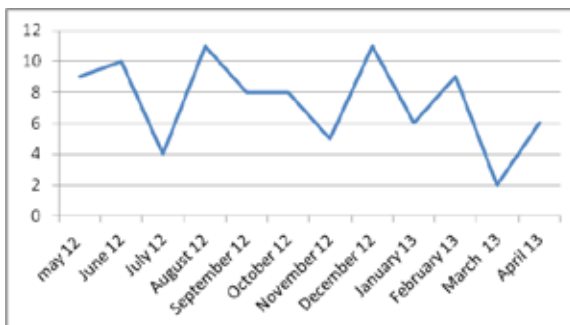
Categories of defects	Number	Pourcent
<b>Musculoskeletal</b>	<b>38</b>	<b>35.5</b>
Clubfeet		
Polydactyly		
Absence of the patella		
Agnesis own bones of the nose		
Syndactyly hands and feet	12	
Others	10	
- Absence of radius with ulna and agnesis of curvature hands internally (1)	3	
- Agnesis Femur and two leg bones (1)	2	
- Limb agnesis (1)	2	
- Flexum Hands (1)		
- Genu recurvatum (1)		
- Macrocephaly and limb defects (1)	9	
- Malformations Chest wall (1)		
- Phocomely (1)		
- Scoliose (1)		
<b>Nervous system and neural tube</b>	<b>33</b>	<b>30.8</b>
Anencephaly	12	
Hydrocephalus	9	
Spina bifida	6	
Macrocephaly	4	
Encephalocele	2	
<b>Face, head and neck</b>	<b>13</b>	<b>12.1</b>
Cleft lip and palate	11	
Cervical congenital lymphedema	1	
Exophthalmos	1	
<b>Abdominal wall and digestive system</b>	<b>13</b>	<b>12.1</b>
Omphalocele		
Ano-rectal malformation	6	
Congenital hepatomegaly	2	
Others		
- Agnesis of the broad abdominal muscles	2	
- Esophageal Atresia	3	
- Laparoschisis		
<b>External genitalia</b>	<b>5</b>	<b>4.7</b>
Sexual ambiguity	3	
Coalescence of labia	1	
Hypospadias	1	

Others	5	4.7
Vascular malformations	2	
Macrosomia	1	
Syndrome of Pierre Robin	1	
Trisomy 21	1	
<b>Total</b>	107	<b>100.0</b>

The malformations of the musculoskeletal system are the most common in 35.5% of cases followed those of the nervous system and the neural tube in 30.8% of cases. Others are relatively rare.

Clubfeet (12), the anencephaly (12), the cleft (11), the syndactylies (10), hydrocephalus (9), spina bifida (6) and omphalocele (6) are malformations the most frequent. They represent 56/89 malformed children is 62.9% of cases.

### 3. Breakdown of defects in the year



Curve 1: Breakdown of defects in the year

The months of August and December are those which have experienced the highest rates of malformations encountered.

### DISCUSSION

A study on the apparent congenital malformations was conducted in four formations of the Northern and Southern Provinces, provinces to the east of the DRC where insecurity is recurrent.

89 malformed newborn son 11500 births were observed during the period of our study, either a prevalence of 0.77%. The studies of Ndjate and MPUU have respec-

tively found the prevalence rate 0.67% and 1.2% in the respective towns of Lubumbashi and Kinshasa [8, 9]. Our prevalence swings between those found between the two towns of the DRC.

44 malformed newborns or 49.4% were male and 42 were female or 47.2%, but 3 of them had a sexual ambiguity. As far as concerning Lary Paulozzi [10] and Halliday and Riley [11] we have found a slight male predominance.

38 malformed infants, 42.7% had malformations of the musculoskeletal system, 33 or 37.07% of the neural tube. The predominance of osteo articular defects was also found in the Netherlands in contrast to neural tube defects [12] that have a high prevalence in our context and in other African countries such as Sudan [13].

Among newborns with malformations of the musculoskeletal system, 12 or 31.6% were carriers of a clubfoot and 10 or 26.3% of polydactyly. The notable incidence of clubfoot in our series and this was also noticed by Mkandawire Kaunda in Malawi [14].

### CONCLUSION

The apparent congenital birth defects are a reality in the provinces of North Kivu and South Kivu in the eastern part of the Democratic Republic of Congo, a prey to recurring wars. Both provinces are, however, affected the same way with a predominance of the HGR / Ciriri among the four structures. Malformations of the musculoskeletal system are the most observed with top club feet, followed by nervous system malformations and neural tube head with anencephaly, followed by hydrocephalus. It will be important to conduct a major study to describe and give the prevalence of malformations in order to put in place monitoring and implementation strategies with appropriate public health measures for the prevention and management.

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