Prevalence And Severity of Visible Malformations in the Town of Mbujimayi.

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ABSTRACT *The study aimed to determine the prevalence and evolution of visible malformations in the town of Mbujimayi, Democratic Republic of Congo.*

Material and methods. This was a descriptive study retro and prospective. It has been conducted over a period of 8 years in 25 hospitals and 39 maternity hospitals and health centers in the town of Mbujimayi. Data collection sheets were filled under the supervision of physicians responsible for the medical training. Every newborn, either normal or malformed, have been examined by a doctor.

Results. We have found 36 malformed newborns for 100 000 births or a prevalence of 0,04%. The most affected parts of the body were the limbs (41.4%), the face (13.1%), skull (10.9%), spine (9.9%), abdominal / thoracic wall (9, 6%) and generalized malformations (9.0%). The malformations that have caused the most deaths have involved the spine (44.4%), abdominal / thoracic wall (40.0%), generalized malformations (39.4%) and the skull (25.0%).

Conclusion. Our study found 36 newborns with visible congenital malformations for 100 000 births in Mbujimayi; but this prevalence is surely underestimated. Further studies are needed to identify the prevalence of non-visible malformations and to find the causative factors of malformations in our town.

Introduction

The malformations are a field of research area widely world exploited. In Africa and the Democratic Republic of Congo in particular, few studies have been reported on this subject [1-5]. By cons, in Mbujimayi, there is no serious study which has yet been undertaken. As soon as the frequency of different malformations varies widely from one region to another, from one people to another; we have been wondering the following questions: what is the prevalence of visible congenital malformations in Mbujimayi? What are the most affected parts of the body? What are the most common types of birth malformations? How do the children with visible congenital malformations improve in Mbujimayi? We have thus undertaken this study to indentify the prevalence and the evolution of visible malformations in the town of Mbujimayi so as to make a disposal on baseline data about these malformations to the teachers and researchers.

Material and Methods

The study involved a period of 8 years, from January 2003 to February 2011 in 25 hospitals and 39 maternity hospitals and health centers in the town of Mbujimayi. Only medical centers managed by a doctor have been selected for the study.

The study was retrospective for the period from 2003 to 2009 and prospectively for the period from 2010 to 2011. The parameters used for this study were: the topographical location, the type of malformation and evolution. Data collection sheets were filled by physicians responsible for the medical training. Every newborn, either normal or malformed have been examined by the doctor.

Results

1. Prevalence of malformations In our study, we have identified 1,004,391 newborns whose 365 with visible malformations, either a prevalence of 0,0363% or 36 newborns malformed for 100 000 births.
2. Location of malformations The most common malformations were localized to the limbs (41.4%), the face (13.1%), the skull (10.9%), the spine (9.9%) and abdominal / thoracic wall (9.6%) (Table I).

Table I: Frequency of malformations according the part of body affected

Part of body affected	Effective	%
Limbs	151	41,4
Face	48	13,1
Skull	40	10,9
Spine	36	9,9
Abdominal wall / Thoracic	35	9,6
Generalized	33	9,0
Urogenital	13	3,6
Gut	9	2,5
Total	365	100,0

The ten most common visible congenital malformations were: polydactyly (20.0%), cleft lip / cleft palate (10.4%), club foot (9.8%), spina bifida (9.8%), macrocephaly (8.8%), Down's syndrome (7.9%), omphalocele (6.8%), syndactyly (4.4), cryptorchidism (3.0%), anorectal malformations (2.5%) (Table II)

Table II: Relative frequency of diagnosed malformations (n = 365)

MALFORMA-TIONS	EF-FEC-TIVE	%	Fréq/100.000 births	Number of birth for 1malformation
Limbs (n= 151)				
Polydactyly	73	20,0	7,27	13759
Club-foot	36	9,8	3,58	27900
Syndactyly	16	4,4	1,59	62774
Polymalformation of limbs	8	2,2	0,80	125549
Péromelia	5	1,4	0,50	200878
Amelia	5	1,4	0,50	200878
Supernumerary of limbs	4	1,1	0,50	251098
Ectromelia	3	0,8	0,30	334797
Phocomelia	1	0,3	0,10	1004391
Face (n= 48)				
Cleft lip / palate	38	10,4	3,78	26431
Agenesis of the eye	4	1,1	0,40	251098
Agenesis of the lips	2	0,5	0,20	502196
Agenesis of the ear	2	0,5	0,20	502196
Agenesis of mouth	1	0,3	0,10	1004391
Presence of teeth at birth	1	0,3	0,10	1004391
Skull (n = 40)				
Macrocephaly	32	8,8	3,19	31387
Anencephaly	6	1,6	0,60	167399
Encephalocele/ Meningocele	2	0,5	0,20	502196
Rachis (n= 36)				
Spina bifida	36	9,8	3,58	27900
Abdom wall / Thoracic (n= 35)				
Omphalocele	25	6,8	2,49	40176
Umbilical hernia	8	2,2	0,80	125549
Laparoschisis	1	0,3	0,10	1004391
Inguinal hernia	1	0,3	0,10	1004391
Generalized malformations (n=33)				
Down's syndrom	29	7,9	2,89	34634
Polymalformation	4	1,1	0,40	251098

Urogenital tract (n=13)				
Cryptorchism	11	3,0	1,1	91308
Hermaphrodism	1	0,3	0,10	1004391
Stenosis of the urethral meatus	1	0,3	0,10	1004391
Gastrointestinal (n=9)				
Anorectal malformation	9	2,5	0,90	111599
Total	365	100,0	36,34	2737

4. Evolution of malformed children in the first month of life

We have recorded 57 deaths in the first month of life among 365 malformed children, which means a lethality of 15.6%. The lethality of the most serious malformations arose, according to the locations in the following descending order: the spine (44.4%), abdominal / thoracic wall (40.0%), generalized malformations(39.4%) and the skull (25.0%). (Table III).

Table III. Evolution of newborns according to the part of body of malformations

Location of malformations	Evolution				Fatality Rate
	Alive	Dead	Unspecified	Total	(%)
Spine	15	16	5	36	44,4
Abdominal wall / Chest	17	14	4	35	40,0
Generalized	20	13	0	33	39,4
Skull	24	10	6	40	25,0
Uro-génital tract	5	1	7	13	7,7
Face	35	1	12	48	2,1
Limbs	139	2	10	151	1,3
Gut tract	6	0	3	9	0,0
Total	261	57	47	365	15,6

By the type of malformation, the rate of fatality is presented in the following order: Phocomelia (100.0%) Anencephaly (100.0%), Polymalformation (100.0%), Omphalocele (56.0%) Spina bifida (44.4%) and Down's syndrom (31.0%). (Table IV)

Table IV. Evolution of the most lethal malformations

MALFORMA-TIONS	EVOLUTION				Fatality Rate (%)
	Alive	Dead	Unspecified	TOTAL	
Anencephaly	0	0	6	6	100,0
Polymalformation	0	0	4	4	100,0
Phocomélia	0	0	1	1	100,0
Omphalocele	8	3	14	25	56,0
Spina bifida	15	5	16	36	44,4
Down's syndrom	20	0	9	29	31,0
Amélia	4	0	1	5	20,0
Macrocéphaly	25	3	4	32	12,5
Cryptorchidism	10	0	1	11	9,1
Cleft lip / palate	28	9	1	38	2,6

Discussion

1. Prevalence of malformations

The overall prevalence of visible malformations was 0.04% in the town of Mbujimayi. This prevalence seams to be lower compared to that have been found elsewhere in our country: in the town of Lubumbashi by LACOMBE (0.15%) [1] and by Lubala (5.84 for 1000 births or 0.584%) [2], in the East DRC by Ahuka OL (0.41%) [3], in several localities of the DRC by Tandu-UMBA (1.2%) [4]. The prevalence found in our study seemed lower compared to those found by other authors in Africa. In Kenya, WU has found 0.63% [5], in Rabat Chabbar has found 0.44% [6]. In a study in Ife-Ijesha in southern Nigeria, Bakare has found a prevalence of 6.9% [7], while OBU has found 8%, in the same country in Enugu, a town which is located in south-east of Nigeria [8]. In the World, various prevalences have been reported; for example: 0.72% by FABRICIO in Ecuador [9], 0.97% by FOUZIA in Pakistan [10]. These figures demonstrate the variability of the prevalence of malformations according to the region and the people. It is true that in Mbujimayi town, few births still take place at home or in small neighborhood clinics; but the reduced number of these undocumented births is not enough to justify the very low prevalence of malformations found in our study. We believe that the most likly explanation is that, in our study, we have only considered the visible malformations and whose diagnosis was figurate out by a doctor.

2. Relative frequency of visible malformations

Our study revealed that the most common visible congenital malformations were apparent polydactyly (20.0%), cleft lip / cleft palate (10.4%), club foot (9.8%), spina bifida (9, 8%), macrocephaly (8.8%), Down's syndrome (7.9%), omphalocele (6.8%), syndactyly (4.4), cryptorchidism (3.0%) and anorectal malformations (2.5%) (Table II).

These results are comparable to those of KROMBERG which, in a study conducted in South Africa, has found that the most common malformations were, in order of decreasing frequency: polydactyly, club foot, spina bifida, anencephaly and cleft lip [11].

The same observation was also made by Shija in a study conducted in Dar es -Salam in Tanzania [12].

In contrast WU has found, in a study conducted in Kenya, that clubfoot deformity had the highest prevalence [5].

SACHDEVA has found the following decreasing frequencies in a study conducted in India: anencephaly, clubfoot, meningomyelocele (spina bifida), cleft lip / palate, hydrocephalus, anorectal malformation, polydactyly, esophagealtracheal fistula and syndactyly [13].

Apart from the variability of the frequencies of malformations according to the part of body, these differences could also be explained by the methods of recruitment of sampling, variable according to the authors.

3. Part of body affected

Our study revealed that the most common visible malformation were localized to the limbs (41.4%) to the face (13.1%), to the skull (10.9%),to the spine (9.9%), to the abdominal / thoracic wall (9.6%) and generalized way (9.0%) (Table I).

MAYANDA, in Congo Brazzaville, also found that malformations of the musculoskeletal system were the most frequent [14].

The same observation was also made in Ouagadougou by YOUL who has found that the most common site of the body were the limbs malformations (35.8%), nervous system (26.5%), gastrointestinal tract and abdomen [15].

Similar results were also reported by Chabbar in Rabat where the most common sites of body were constituted by the central nervous system (45.4%) and musculoskeletal (33.4%) [6].

Our results differ from those published by ADEYOMO after a study in Nigeria which showed that malformation of the cardiovascular system, central nervous system and the gastrointestinal system constituted 71.6% of all malformations [16].

Moreover, MOHAMMED has found in Saudi Arabia that the most affected systems were the digestive system (28.6%), central nervous system (26.1%) while the locomotor system is only affected to 3.6% [17].

These figures can not be fully comparable, according to the sampling mode including either all malformations or exclusively visible malformations.

4. Evolution

The overall mortality rate of malformations found in our study was 15.6% (57 deaths out of 367) and malformations leading to more deaths were:

anencephaly (100%), omphalocele (56%), spina bifida (43.2%) and Down syndrome (31%) Our study also showed that, depending on the topography, malformations of the spine, skull, the abdominal wall and the generalized malformations were those that had caused more deaths. These results confirm those of Tandu-UMBA that has found in a study conducted in the DRC, children with malformations died most often and that the most affected organs where nervous system and the musculoskeletal system [4].

ADEYOMO has found that overall mortality of malformations was of 19.4% in Nigeria [16].

MALCOE has found in California (USA) that malformation lead to death in 19% of cases among black men [18].

LEE, still in the US, found that the congenital malformation of the nervous system, cardiovascular and respiratory were responsible for 60% of deaths of all malformations [19].

Conclusion

We have listed the visible congenital malformations in the town of Mbujimayi. Their prevalence of 0.04% is surely underestimated. The part of body most affected are the limbs, face, skull, spine, abdominal wall and generalized malformations. The visible malformations were dominated by polydactyly (20.0%), labial / cleft palate (10.4%), club foot (9.8%), spina bifida (9.8%), macrocephaly (8.8%), Down's syndrome (7.9%), omphalocele (6.8%), syndactyly (4.4%) cryptorchidism (3.0%) and anorectal malformations (2, 5%). Among these frequent malformations the most lethal were: phocomely (100.0%), anencephaly (100.0%), the polymalformations (100.0%), omphalocele (56.0%), spina bifida (44.4%) and Down syndrome (31.0%). Further studies

are also needed to identify the prevalence of non-visible malformations and try to find the causative factors of malformations in our town of Mbujimayi.

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