

Congenital Heart Disease: Epidemiological and Echocardiographic Aspects of 167 Cases at The Teaching Hospital of Lamorde / Niamey / Niger

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Introduction

Congenital heart disease are abnormalities of the heart that appear during heart formation during intrauterine life [1]. Their incidence is estimated between 7 to 8 per 1,000 births, according to the literature [2]. Doppler echocardiography is nowadays the essential examination in the diagnosis of congenital heart disease. This is how we decided to do this study entitled "Epidemiological and echocardiographic aspects of 167 cases at Lamorde university hospital." In order to have an inventory of congenital heart disease, In Niger.

Materials and Methods

This is a retrospective study carried out in the cardiac ultrasound laboratory of the internal medicine and cardiology department of the Lamorde university hospital center over a period of 3 years old and 3 months. It runs from April 23, 2013 to July 14, 2016. We used a 5MHz cardiac probe on a Mindray brand ultrasound machine. We included in our study, all echocardiographic reports of children aged 0-15 years diagnosed with congenital heart disease and containing complete epidemiological and ultrasound data. The data were entered and analyzed using office 2010 software and EPI info 3.5.3.

Result

In total, we collected 167 cases of congenital heart disease out of 432 echocardiographic examinations in the cardiac ultrasound laboratory of the Lamorde Teaching Hospital, in 39 months. Congenital heart disease represented 1.09% of the 15 214 users of the Lamorde Teaching Hospital. 92.81% of our patients came from the city of Niamey (urban) (Figure1). The male sex was in the majority in 50.29% of cases with an M / W sex ratio of 1.01 (Figure 2). The most frequent age group was that of less

than 10 months with 70.05% of cases (Table 1). The mean age was 48 months +/- 3 days with extremes ranging from 7 days to 96 months (Table 1). The most common reasons for performing ultrasound were malformation assessment (46.70%), exploration of radiological cardiomegaly (22.75%), respiratory distress (13.17%) and heart murmur (10.77%) (Table 2). From an echocardiographic point of view, Interventricular Communication was the predominant congenital heart disease with 65 cases (including 63 cases of membranous, 1 case of infundibular and 1 case of muscle) or a frequency of 38.92% of cases (Table 3). The congenital heart diseases frequently encountered according to the nosological entities, in our series were among others: inter-ventricular communication (53.29%), inter-atrial communication (31.13%), fallot tetralogy (9.58%), atrioventricular (4.79%), ductus arteriosus (2.39%), single ventricle (2.39%) and Fallot's trilogly (1.79%), (Table 4).

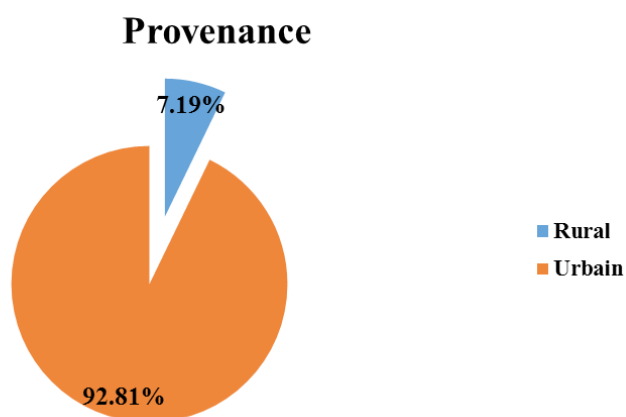


Figure 1: Distribution of patients by provenance.

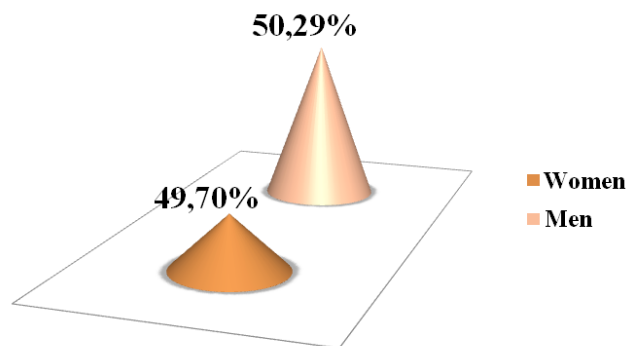


Figure 2: Distribution of patients by Sex.

Table 1: Distribution of patients by age range.

Age range	Patients	Percentage (%)
-10 month	117	70.05
10 -19 month	23	13.77
20-29 month	7	4.19
30- 39 month	9	5.38
40- 49 month	8	4.79
+ 50 months	3	1.79
Total	167	100

Table 2: Distribution of patients by reason for performing trans-thoracic echocardiography.

Reason for consultation	Patients	Percentages (%)
Subcostal draw	6	3.59
Heart murmur	18	10.77
Malformative assessment	78	46.70
Respiratory distress	22	13.17
Radiological cardiomegaly	38	22.75
Dyspnea	4	2.63
Convulsion	1	0.59
Total	167	100

Table 3: Distribution of patients by type of congenital heart disease depending of ultrasound data.

Congenital heart disease		Patients	Percentages (%)
Single ventricle		3	1.79
Single ventricle + large ASD ¹		1	0.6
Transposition of the great vessels +VSD ²		1	0.6
T4F ³		16	9.58
T3F ⁴		3	1.79
Aortic stenosis +ASD OS ⁵		1	0.6
Persistence of FO ⁶		1	0.6
PDA ⁷		3	1.79
Single headset		1	0.6
Epstein		1	0.6
Dextrocardia + ASD OS+ dilatation of right cavities		1	0.6
Dextrocardia		1	0.6
AVC ⁸	ful	7	4.19
	incomplete	1	0.6
ASD	OS	31	18.56
	OP ⁹	2	1.2
	Dystrophic ASD	1	0.6

VSD	Membranous	63	37.72
	Infundibular	1	0.6
	Muscular	1	0.6
Muscular VSD + Left Ventricular hypoplasia		1	0.6
Membranous VSD + pulmonary stenosis		3	1.79
Muscular VSD + pulmonary stenosis		1	0.6
Infandibular VSD +PDA		1	0.6
VSD+ right ventricular hypertrophy+ pulmonary lanes stenosis		1	0.6
Membranous VSD + biventricular Dilatation		1	0.6
VSD+ASD OS + pulmonary stenosis		1	0.6
Membranous VSD + Tricuspid atresia + Mitral regurgitation		1	0.6
ASD OS+ Mitral atresia		1	0.6
ASD OS+ membranous VSD		12	7.18
ASD OS+VSD under aortic + aspect of the vessels terminating to the left atrium		1	0.6
Aspect of the tricuspidian valve ballooning + moderate dilation of both atria		1	0.6
Total		167	100

Table 4: Distribution of patients by type of the nosological entities of congenital heart diseases.

Congenital heart diseases	Patients	Percentages (%)
Ventricular septal defect	89	53.29
Atrial septal defect	52	31.13
Tetralogy of fallot	16	9.58
Trilogy of fallot	3	1.79
Single ventricle	4	2.39
Persistant ductus arteriosus	4	2.39
Single atrium	1	0.6
Atrioventricular canal	8	4.79
Patent foramen ovale	1	0.6
Dextrocardia	2	1.2
Transposition of the great vessels	1	0.6
Mitral atresia	2	1.2
Tricuspid atresia	1	0.6
Pulmonary stenosis	2	1.2
Aortic stenosis	1	0.6
Pulmonary narrowing	1	0.6
Ballooning of the tricuspid valve	1	0.6
Hypoplasia of Right ventricular	1	0.6

Discussion

In our study, congenital heart disease represented 1.09% of the 15,214 users of the Lamorde Teaching Hospital during the study period. This rate is close to those of Nébié and Samandoulougou in Burkina-Faso, of Abena-Obama in Cameroon, of M'pemba Loufoua Lemay in Brazzaville, of Amon-Tanoh-Dick in Ivory Coast who reported respectively 0 , 72%; 0.78%; 0.64%; 0.5%; 0.1% [3-7]. This slight variability in the results could be linked to the different methodologies used by the authors.

92.81% of our patients were from urban settings in our series. The same observation (urban area: 79%) was made by Oulahbib

in Morocco in 2017 [8]. This could be explained by the fact that the urban population has more access to cardio pediatric care in Africa.

The male sex was in the majority in 50.29% of cases with an M / F sex ratio of 1.01 in our study. Our result is comparable to certain data in the literature which found a male predominance. These are Kinda in 2015 in Burkina Faso, Kokou in Togo in 1996 and Touré in Niger in 1995 with respectively M / F sex ratios: 1.1; 1.6 and 1.16 [9,10,11]. It also differs from those of Martinez et al in Spain [12] and Oulahbib [8] who find a female predominance with respective M / F sex ratio (0.92 and 0.98).

In our series, the average age was 48 months +/- 3 days with extremes ranging from 7 days to 96 months. Oulahbib finds a mean age of diagnosis smaller than ours (6.69 days, with extremes of 0 days and 29 days) [8]. This disparity could be explained by the delay in the consultation linked on the one hand to the degree of cardiopathy of adaptation to extrauterine life [13] and on the other hand by the lack of an adequate technical platform for the management of congenital heart disease in Niger.

The most common reasons for performing ultrasound were malformation assessment (46.70%), exploration of radiological cardiomegaly (22.75%), respiratory distress (13.17%) and heart murmur (10.77%) in our study. On the other hand, in Kinda et al, it is the breath (39.53%) and the respiratory distress (20.16%) which are in the foreground.

According to the nosological entities, the congenital heart diseases frequently encountered in our series were, among others: inter-ventricular communication (53.29%) and inter-atrial communication (31.13%). Kinda also finds a similar result with 28.26% inter-ventricular communication and 23.19% interatrial communication. [9] Oulahbib, unlike the others, he finds the persistence of the ductus arteriosus (32.9%) and interatrial communication (32.1%) as the most common congenital heart disease [8].

Conclusion

Congenital heart disease is a public health problem in a country with insufficient human and material resources like Niger. This retrospective study revealed a hospital frequency of 1.09%. This frequency could be underestimated due to the low rate of centers equipped with cardiac ultrasound and qualified personnel for diagnosis and the absence of a surgical management center in Niger. A large-scale study is needed to screen so many children in Niger in order to better organize themselves for adequate

management of congenital heart disease.

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