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Research Article

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Interventricular Communications of the Child: Retrospective Study of 293 Cases at the Dakar Chu

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Summary

Interventricular communications (IVC) are non-cyanogenic congenital heart diseases characterized by dehiscence of the interventricular septum. It represents 20 to 30% of congenital heart diseases. Our objectives were to determine the hospital frequency of isolated IVC, to describe the clinical aspects, to assess medical and surgical management and to assess the prognosis. It is a retrospective descriptive and transversal study. All patients with isolated IVC aged 0 to 15 years were included. Sphinx plus2 software was used for database design and analysis. We collected 293 files, a prevalence of 44 per 1000. The average age at the time of diagnosis was 16 months. The sex ratio was 1.02. Recurrent infections accounted for 65.9%. Parental consanguinity was found in 35.8% of cases. Heart failure was noted in 7.5% of the cases, weight loss in 48.1%. Cardiomegaly was noted in 74.1% of cases with 54.9% of pulmonary hypervascularization. Perimembranous IVC was the most frequent with 84.6%. Large IVC represented 62.5% and multiple IVC 8.2%. Pulmonary arterial hypertension (PAH) was present in 58% of cases. Diuretics were prescribed in 76.5% of cases. Fifteen (15) catheterizations were performed, ie 5.1%. A complete cure was carried out in 20.1% of the cases. IVC are frequent, serious due to the repercussions, especially in the lungs. Surgical management of impacted forms should be improved.

Keywords: Interventricular Communication; Ultrasound; Child; Dakar.

Introduction

Interventricular communications (IVC) are non-cyanogenic congenital heart defects with left-to-right shunt, characterized by dehiscence of the interventricular septum. They represent 20 to 30% of congenital heart diseases. Its etiology is unknown [1]. The diagnosis can be prenatal. In Africa, the diagnosis is often late (age> 1 year)(2). Currently, Doppler ultrasound is the benchmark examination for the diagnosis and monitoring of IVC. It determines the size and location of the defect. The treatment is variable and has two components: medical and surgical. Its main purpose is to close the defect and avoid complications. In untreated patients, the course may be favorable with spontaneous closure of the IVC. Elsewhere they can progress to obstructive pulmonary vascular disease and lead to the installation of Eisenmenger syndrome. Antibiotic prophylaxis for infectious endocarditis is an important factor in the survival of children. There are few studies focusing exclusively on IVC. Thus, our general objective was to carry out a study on isolated IVC.

Methods

It is a retrospective descriptive and transversal study performed at the National Pediatrics Hospital Center Albert Royer, in the

thoracic cardiovascular surgery department and at the cardio-pediatric center; over a period from January 2010 to December 2017. The children aged 15 years or less, carrying IVC, confirmed by cardiac Doppler ultrasound (Philips Sonos 7500 and Acuson S2000TM) were included. The associated diagnoses of Down's syndrome, Edwards syndrome, Noonan syndrome and Pierre Robin syndrome were based essentially on the phenotypic aspects (the karyotypes could not be performed). Data were collected from patient records as well as hospital records. Sociodemographic data, clinical and therapeutic summaries, the socio-economic level based on the parents' professional activity as well as the data in the files. A survey sheet was used to support the data. Sphinx plus2 software was used for database design and data analysis. The text was entered using Microsoft Word 2016 software.

Results

Our study identified 293 cases, a prevalence of 25% and 44 per 1000 cardiological consultations. We noted a sex ratio of 1.02. The average age was 29 months with extremes of 1 day to 180 months (15 years) and the median of 13 months. The mean age of the children at the time of the diagnosis of the IVC was 16 months with extremes 0 to 168 months (14 years) and the median of 7 months (Figure 1). The antenatal diagnosis of IVC was made in 5 patients. A delay in psychomotor development was observed at 19.1% (n = 56). Most patients had experienced repeated episodes of otolaryngology and lung infections (Table I). The Socio-economic Level of 173 families was considered low, in 59%. We had found a history of heart disease including 3 cases of CIV. The average age of the mothers was 29 years with extremes of 16 and 44 years. The concept of inbreeding was present in 35.8% with 13.3% for the 1st degree and 16% for the 2nd degree. Forty-two (42) children had down syndrome (14.3%) and two (2) had Edwards syndrome (T18). There were also 3 cases of Noonan syndrome and 1 case of Pierre-Robin syndrome. In our study, 57.7% (n = 169) of patients were referred. 60.1% of the children were seen in consultation for follow-up. The reasons for hospitalizations were dominated by infections with 27, 9% of the population. In the first line were found pulmonary infections, which represented 23.5% with a predominance of cases of bronchiolitis. The rate of cardiac decompensation was 8.5% (Table II). The mean weight at the time of the consultation was 9.9 kg with extremes of 2 kg and 64 kg. All of the patients in the group had a VIC murmur of varying intensity and other manifestations such as heart failure, weight-delay, respiratory distress, chest deformation. The echocardiography showed cardiomegaly in 219 children (74.7%). Pulmonary hypervascularization was present at 54.9% and hypovascularization at 1.8%. The average size of the defect was 8.68 mm with extremes of 2.3 and 19 mm (Table III). An inversion of the shunt was found in 3 patients. The average Trans ventricular gradient was 42 mmHg. The hemodynamic impact was dominated by dilation of the cavities with 35.5% for the left cavities and 5.8% for the right and bilateral cavities in 10.9%. We also had an impact on the pulmonary artery with dilation in 20.8%. Stenosis was present in 16.4% of cases. Pulmonary arterial hypertension (PAH) accounted for 157 cases or 53.6% of our population. Management was mainly medical dominated by prescriptions for diuretics and AEC inhibitor; however, there were 15 cases of catheterization and 59 cases of complete cures (Table IV). In our series, 36.2% of children were lost to follow-up compared to 59.4% who were regularly followed up. Five cases of death (1, 7%) were found. The main cause was cardiac decompensation.

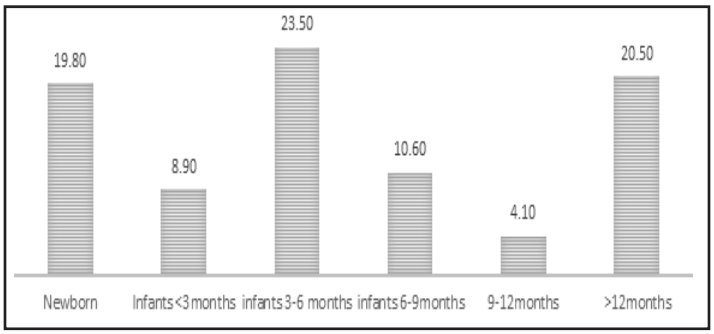

Figure 1: distribution of patients by age group

Table I: Distribution according to postnatal history

	Numbers	Percentage %
Eating difficulties concept	104	35.5
Dyspnea concept	216	73.7
Concept of repeated infection	193	65.9

Table II: Summary of the reasons for consultation / hospitalization

Reasons for consultations/ hospitalisation		Number cited	Frequency%
Heart monitoring		176	60.1
Respiratory distress		103	35.2
Severe anemia		3	1
Infectious syndrome	Malaria	2	0.7
	Bronchiolitis	44	15
	Pneumonia	25	8.5
	Endocarditis	3	1
	Febrile gastroenteritis	8	2.7
Decompensated heart disease		25	8.5
Malnutrition		1	0.3
Ingestion of caustic products		1	0.3

Table III: Distribution of IVC by seat

IVC Headquarters	Number cited	Percentage %
Perimembraneuse	248	84.6
Trabeculated	23	7.8
Admission	21	7.2
Infundibular	11	3.8
Total observation	**293**	**100**

Table IV: distribution according to medical and surgical management

Medical treatment		
Diuretics 76.5% (n = 224)	Digoxin 20.8% (n = 61)	AEC inhibitor 39.2% (n = 115)
Catheterization 5.1% (n = 15)		
Surgical treatment		
Strapping 4.4% (n = 13)	Cure 20.1% (n = 59) Out of the country 14% In the country 6.1%	

Discussion

CIV is the most common congenital heart disease. The world average varies between 25-30% [1]. It is all the higher as the country has technical means adapted to its screening. In our cohort, the average age of the patients can be compared with those of Menta and al. who found an average of between 29 and 30 months [2, 3]. In Morocco, study reported discovery 44% in infants under 1 year of age and 31% in newborns [4]. This predominance in infants has also been reported by other authors such as G. Kinda [5]. This diagnosis remains late compared to developed countries, which have better diagnostic tools. Indeed, in these countries, the trend is towards prenatal diagnosis. Thus, Fang F. reported an incidence of 10% in China [6]. There appears to be a moderate increase in risk in children whose mothers are over 35 years of age. Some authors like Buchon and al. found that the risk was increased when the maternal age was over 30 years and would be 5.6% in women over 40 years old [7]. Conversely, Briard and al. found no correlation between maternal age and the occurrence of malformation, except in trisomy 21 [8]. Morales estimated that 14-27% of IVC cases are associated with Down syndrome [9]. The association Down syndrome and congenital heart disease is noted in several studies [10, 11]. The concept of consanguinity was found in several Senegalese studies including that of Léye and al. who found a high inbreeding rate with 92.7%. Shieh reported a more increased risk for marriages between first cousins first degree (20%) especially for heart disease associated with chromosomal diseases [12, 13]. Most often, IVC are revealed by a heart murmur, unexplained hypotrophy, feeding difficulties, respiratory distress during repeated upper airway and tracheobronchial infections. Our patients who had a history of eating difficulties represented 35.5% against 13% in the series of Benbahi [4]. The hospital prevalence of heart failure from the Kamdem series was 3.1% [14]. He also found a history of infection in 12.5% of his patients. Intra-hospital series in Casablanca reported 51% of bronchiolitis cases [4]. The functional manifestations and physical signs depend on the size of the shunt and the state of pulmonary vascular resistance. In Cameroon, Kamdem's work reported the same symptomatology but with lower rates [14]. Other physical signs were found such as cyanosis, thoracic deformation and digital hippocratism. The appearance of cyanosis reflects an inversion of the shunt and the progressive evolution towards fixed pulmonary hypertension. Yilmaz G. and Bonow. Reported that children with heart disease were more prone to nutritional disorders and weight loss [15]. Currently, the chest X-ray is an integral part of the non-invasive diagnostic approach to congenital heart disease. Indeed, it is an excellent indicator of the morphology of the large vessels and the state of the pulmonary vascularization. The sensitivity and specificity of the radiography are considered insufficient to allow the detection of heart disease in the newborn; as well as the electrocardigraphy [16]. From an ultrasound perspective, the predominance of perimembranous IVC was consistent with the results of many studies [2]. In the same vein, Eroglu found the majority against 21.7% of trabeculated IVC [17]. Large IVC (> 7mm) were also more common in the Diop study [10]. The left cavities were dilated because they are the receiving rooms of the shunt. Other authors found results that overlap with our analysis. Bendriss found an 86% GD shunt, with 82% left cavitary dilation [7]. Abdellaoui reported 11.3% cavity dilation with left dominance [3]. Contrary to these results, Menta and Diop AK found a predominance of the dilation of the right cavities [2, 10].

Conclusion

IVC is a common congenital heart disease. It is serious because of its repercussions especially pulmonary. Surgical management of impacted forms should be improved.

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