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UNDIAGNOSED CONGENITAL HEART DISEAS IN CHILDREN: OPTIMAL SCREENING

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ABSTRACT

A congenital heart disease refers to any anomaly of the heart structure (walls, valves) or to any abnormality of the heart vessels. Undiagnosed congenital heart diseases could lead to severe comorbidities and death. The purpose of our study is to highlight the importance of prenatal care in identifying possible intrauterine cardiac malformations and the necessity of cardiac screening in the first month of life.

Our retrospective study (January 2016-January 2017) included patients between 0 month-6 years admitted on the Pediatric Department of County Clinical Emergency Hospital of Constanta.

The gender ratio M:F was 33:25. Age distribution revealed that 1-3 years group is the most affected (39 cases), followed by 0-1 year (10 cases) and 4-6 years (9 cases).

Cardiac malformation encountered: atrial septal defect -20 cases, followed closely by ventricular septal defect – 18 cases, tetralogy of Fallot-13 cases, pulmonary stenosis-7 cases. Cyanosis was present in 13 cases.

After analyzing our results, we highlight the necessity of cardiac screening in the first month of life.

Keywords: congenital, heard, anomaly, screening, children

Introduction

A congenital heart disease refers to any anomaly of the heart structure (walls, valves) or to any abnormality of the heart vessels (1, 2).

Congenital heart diseases are diagnosed generally during pregnancy or soon after birth, but a substantial number are still discharge from hospital after birth without a proper diagnosis.

The national statistic shows that 1500-1600 patients are born with cardiac malformations, but only one third are diagnosed in time for surgical correction. (3)

Objective

The purpose of our study is to highlight the importance of prenatal care in identifying possible intrauterine cardiac malformations and the necessity of cardiac screening in the first month of life.

Material and method

Our retrospective study (January 2016-January 2017) included patients between 0 month and 6 years admitted on the Pediatric Department of County Clinical Emergency Hospital of Constanta for: persistent tachycardia,

chest pain, upper abdominal pain, hands numbness, syncope, dizziness, excessive sweating, cyanosis, recurrent apnea, dyspnea, fatigue during feeding or effort, failure to thrive, cardiac murmur, respiratory infection, convulsions.

Major points from exclusion criteria were: chromosomal abnormalities, autoimmune diseases, other associated malformations. After parents or caregivers signed the inform consent, anamnesis, physical exam and laboratory investigations (ECG, heart ultrasound, chest x-ray, pulse oximetry and cardiac enzymes) were performed.

One major inclusion criteria was the family history positive for cardiac malformation.

Rsults and discussion

Between 1st of January 2016 and 1st of January 2017, 58 patients were hospitalized in Pediatric Department of County Clinical Emergency Hospital of Constanta with symptoms or signs at admission like: respiratory infection (30 cases), followed by dyspnea (10 cases), chest pain (4 cases), anemia (7 cases), failure to thrive (6 cases), convulsions (1case). Each patient had at least one other hospitalization with respiratory, digestive or cardiac symptoms.

The gender ratio M:F was 33:25, with a predisposition in males. Samanek (4) evaluated 4409 children with cardiac defects. Gender prevalence was similar to our study, with a higher incidence for males.(5)

Higher incidence was in rural areas (51%), comparing with urban areas (49%). One possible explanation can be that patients from rural area have a limited access to medical evaluation during pregnancy, in infancy and childhood.

Age distribution revealed that most children where those between 1-3 years with 39 cases, followed by the 0-1 year age group with 10 cases and the 4-6 years age group with 9 cases. The international literature sustains our results. Shahzada Bakhtyar Zahid obtain a higher incidence for ages 1 to 6 years (6).

Another step in classifying congenital cardiac malformation was by the presence of cyanosis –one of the most important symptoms. In 13 cases the cyanosis was present (Figure 1).

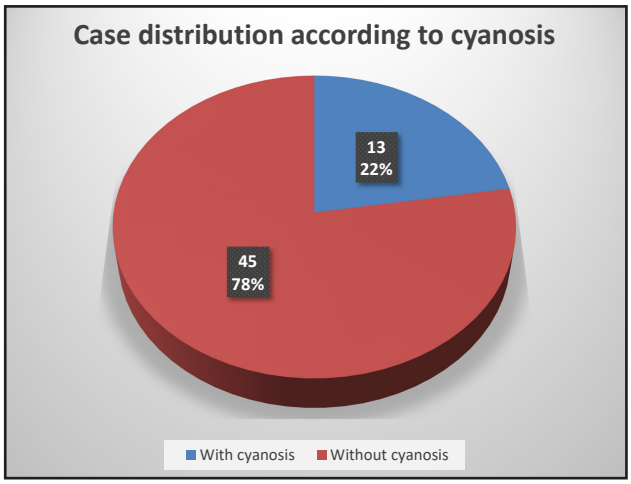

Figure 1: Cases distribution according to cyanosis

After a complete evaluation: physical exam, laboratory investigations, ECG, heart ultrasound, chest x-ray and pulse oximetry we found the following cardiac malformations: the main defect is atrial septal defect (ASD)- 20 cases, followed closely by ventricular septal defect (VSD)– 18 cases, tetralogy of Fallot - 13 cases, pulmonary stenosis - 7 cases (Figure 2).

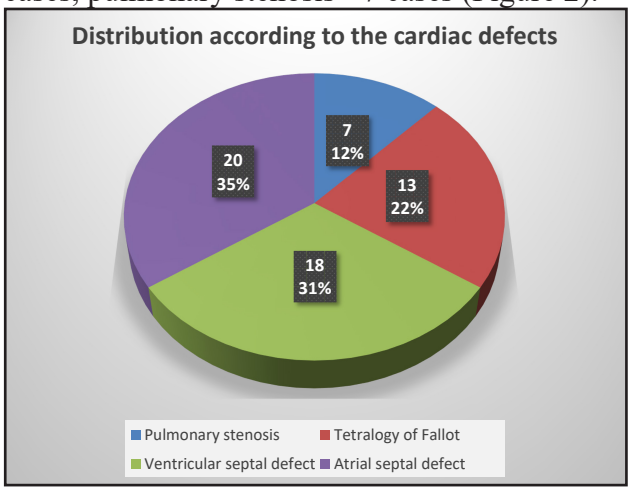

Figure 2: Cases distribution according to the cardiac defects

Atrial septal defect is the most common cardiac malformation, with equal sex distribution. Until the age of 10 years, patients will be periodic evaluated. This age represents the maximum limit of cardiac surgery efficiency (7,8). Four children suffered cardiac surgery to correct the blood flow. Xiaocheng et co. published in 2015 a research project on 1817 patients diagnosed with cardiac malformations revealing that atrial septal defect is the most common acyanotic heart defect (9).

Ventricular septal defect is on second place, with 18 cases. 10 patients were males, 8 were females. 17 had been diagnosed during the first year of life. If the hemodynamic status is not disturbed, they respond to medical management and do not have congestive heart failure, therefore, the surgical intervention could be postponed (10). Depending on the defect type (subarterial, perimembranous and muscular defects) surgery could be indicated at 2 years old, but it could be performed sooner if the blood flow is important, pulmonary hypertension is present (7, 10). In our study, 11 patients had cardiac correction surgery.

From 38 patients diagnosed with VSD and ASD, 15 patients present both of cardiac defects. In all of these 15 cases the surgery was performed.

After evaluating 14.119 pediatric patients Yeh SJ et co sustain that the two most frequent cardiac defects are VSD and ASD. This confirms our data regarding the prevalence of cardiac defects, VSD 18 cases and ASD 20 cases (5).

Pulmonary stenosis could be found like a single pathology, or being part of Tetralogy of Fallot. In seven cases, we diagnosed isolated pulmonary stenosis. Thirteen cases were diagnosed with Tetralogy of Fallot (7 boys and 6 girls).

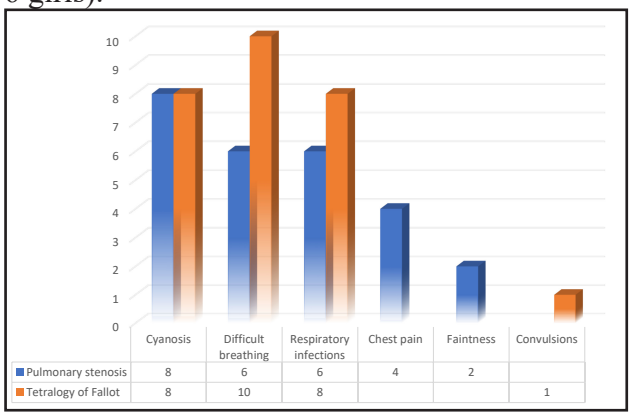

Figure 3: Hospitalization reasons in patients diagnosed with pulmonary stenosis and Tetralogy of Fallot.

According to Shabir Bhimji et co. the most frequent form of presentation in Tetralogy of Fallot is cyanosis. This sustains our results (11). From the total of 18 cases, 16 presented cyanosis, followed by dyspnea and respiratory infection.

For cases diagnosed with Tetralogy of Fallot the family history had some particularities: in 4 cases one parent had a cardiac malformation (aortic coarctation) and in 1 case the mother had syphilis.

Eleven have already had surgical intervention and in two cases parents refused the surgical intervention due to ethnic/religion reasons.

Conclusions

After analyzing our results, we highlight the necessity of cardiac screening in the first month of life. Medical history, pregnancy history are very important along with physical examination and paraclinical investigations.

An appropriate care during prenatal and perinatal period may identify congenital cardiac defects. This is the safest method to have a good prognostic, a high life expectancy, to prevent mortality and morbidity caused by cardiac defects.

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