

INFECTIVE ENDOCARDITIS IN CHILDREN – CLINICAL AND OUTCOME EVOLUTION

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SUMMARY

For a 15-year period (1992 - 2007) in the clinics of the department of pediatrics were hospitalized 10 children with endocarditis from 1 to 13 years of age. One of the children was hospitalized twice during a period of two years.

All children were with preceding congenital defects: ventricular septal defects in 5 cases; valvular aortic stenosis in 1 case; transposition of the great vessels - 1 case; hypertrophic cardiomyopathy - 1 case; ventricular-atrial anastomosis in two child with internal hydrocephaly. Three of the cases were patients with prosthetic endocarditis.

In blood cultures were established *Streptococcus viridans* in 3 cases; *Streptococcus β-haemolyticus* in 2 case; *Staphylococcus epidermidis* in 2 cases and *Staphylococcus aureus* in 1 case. In 84.44% of the cases were found positive blood cultures before starting the antibacterial therapy. In patients who had received antibiotics before -18.17% were with positive cultures.

With echocardiography was detected vegetation in 8 (73.27%) cases.

In the course of the disease were found the following complications: cardiac deficiency - in 7 children, pleuro-pericardial effusions - in 4 cases, septic embolism in 3 patients and purulent mediastinitis - 1 case. Three of our IE cases have had a lethal outcome (27,3%).

Key words: Infective endocarditis, children, clinical evolution, complications

The impact of endocarditis in childhood accompanies many cardio-vascular disorders. Infective endocarditis (IE) is the most frequently occurring form of endocardium inflammation. Prevailing among the agents are *Str. Viridans*, *Str. Haemolyticus*, *Staph. Aureus*, *Staph. Epidermidis*, *Enterococcus*, etc. Expression is different, mainly acute. IE is normally a complication disorder based on preceding congenital cardiopathy or operated heart (3, 5). Bacteria deposit and multiply on heart's endocardium or vessels' endothelium. Endocarditis could become the source of infection and bacteraemia.

Approximately 10% of all IE cases are with children below the age of 10 (4, 6).

The clinical evolution and outcome depend to a great extent on the individual child organism, the ability of a child's

immune system to respond to the increased demands, the age, and the general health of a child.

Infective Endocarditis remains a serious issue in early age. A few factors come to support this worrying statement: the disorder occurrence over the past few years has become more frequent, in relation to the larger number of children with heart operations; protracted and expensive treatment; complications as a result from the disorder, sometimes including a re-operation, and a still high rate lethality.

AIM

Retrospective analysis of IE evolution and outcome in children.

MATERIAL AND METHODS

For a 15-year period (1992 – 2007) in the clinics of the Pediatrics department we have observed 11 IE cases in 10 children at the age from 1 to 13. Six of the children are female, and four - male. One of the children has been diagnosed twice with prosthetic endocarditis caused by various infection agents.

The children have been clinically, paraclinically and instrumentally tested, the decisive being septic condition indices, as well as the analyses of blood cultures and echocardiography.

RESULTS AND DISCUSSION

All children with IE have a preceding cardiac lesion. In 7 of the cases we have had congenital cardiac malformations - 5 children with ventricular septal defects (VSD); 1 with valvular aortic stenosis (AoVSt) and 1 with transposition of the great arteries (TGA), operated under Rastelli. One child had a family obstructive hypertrophic cardiomyopathy (HCMP); and two a ventricular-atrial anastomosis (VAA) based on internal hydrocephaly. In three of the cases we had prosthetic IE.

In all of the cases there was a septic condition with continual febrility, weakness, lack of appetite, difficulty in breathing, vomiting, abdominal pains, skin rash, arthralgia, hepato- splenomegaly, and paraclinical indices for high inflammatory activity.

The haemocultural analysis proved the following bacterial agents: *Str. viridans* in 3 children, *Str. α* -

haemolyticus in two children, Staph. aureus in 1, and Staph. epidermidis – in 2 children. It is important to point out that we have had in 84.44% of the cases positive haemocultures inoculation prior to the start of anti-bacterial treatment (22 out of 26 tests) and only in 18.17% (4 out of 22 inoculations) post anti-bacterial treatment.

Vegetations was detected by echocardiography in 8 of the IE cases (73.27%), located around the cardiac lesion (Fig. 1. and Fig. 2.).

The main complications observed with us are as follows: heart failure in 7 children; pericardial and pleural effusions - in 4 cases; lung or system embolism - in 3 and purulent mediastinitis - 1 case. In some of the children we have encountered complications. For that reason the whole amount of the complications sum more than 100%.

Operative treatment was necessary in 3 of the children.

Three of our IE cases have had a lethal outcome (27,3%). The average pre-hospitalization period in cured

children was 23, against 35 days in the deceased children.

Results show that in our survey children age up to 13 years. As already noted above, the highest frequency was observed in children up to 10 years of age. There has been no significant difference observed between the two sexes. As other authors note the most common agents isolated out of haemocultural analyses are Str. Viridans and Staph. Aureus (1, 7, 8, 9, 10). In over 80% of the tests positive haemocultures were found prior to the start of anti-bacterial treatment, which is understandable. Of a much lower rate were the positive haemocultures in tests done post anti-bacterial treatment.

With all children IE has emerged on the basis of a preceding cardiac lesion, and in our case a larger share is attributed to ventricular septum defect (VSD) - in 5 cases and on one occasion again after operation based on non-cardiac disorder. The allocation of children with preceding cardiopathy is shown on Table 1. Haemocultural analysis results are shown in Table 2.

Fig. 1. Vegetations located around the cardiac lesion



Table 1. Preceding cardiac lesions disorder

Preceding lesions	Number
VSD	5
AoVSt	1
TGA	1
HCMP	1
VAA	2

Fig. 2 . Vegetations located around the cardiac lesion

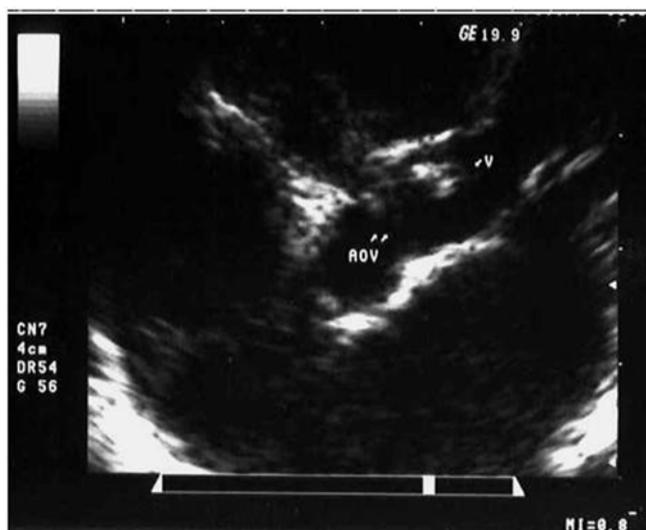


Table 2. Results from the haemocultural analysis

Bacterial agent	Number
Str. viridans	3
Str. α - haemolyticus	2
Staph. epidermidis	2
Staph. aureus	1

Table 3. Complications developing in the course of disorder.

Complications	Number
Heart failure	7
Pericardial and pleural effusion	4
Thromboembolism	3
Mediastinitis	1

Despite the timely implementation of anti-bacterial and symptomatic treatment, complications in the course of the disorder did occur. The complications occurring in the course of disorder are shown in tab. 3.

The leading complication in 7 of the cases was cardiac deficiency. This is explanatory in view of the preceding congenital cardiopathy and the general prejudicial condition of the children. The remaining complications – the presence of pericardial and pleural effusions we managed conservatively. The most dramatic and involving hard effort was our battle to contain the cases of embolism and mediastinitis development in one of the cases, where an

operation “on the hot” became necessary. Other authors also inform of dramatic development and fatal outcome of the same and other complications – stroke in seven children (2, 9).

Under the circumstances, despite the appropriate symptomatic and surgical treatment, death rate in children with IE remains high. In our survey we have registered lethality of 27.3%, which corresponds to data from other authors (6). The most common complication, resulting directly into a lethal outcome is the development of a heavy cardiac deficiency in 70% of the cases. The most dramatic and hard was the evolution of the disorder in the presence of system and lung embolism, quoted by other authors (2).

In conclusion it should be said that IE remains still as a problem for contemporary medicine and in particular pediatric cardiology and cardio surgery.

The results from our retrospective study allow us to draw the following conclusions:

1. IE is a serious disease with lethality in our cases of 27.3 %.
2. There is a presence of a preceding cardiac lesion.
3. The most common complication is cardiac deficiency (70%), and the hardest one - system and lung embolism.

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