Epidemiology of Infective Endocarditis in Children

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The evolution of antibiotics, surgical management and postoperative care for the children with congenital heart disease (CHD) causes the change of the epidemiology of infectious endocarditis (IE) in children.

The incidence of IE between 1930 and 1959 was 0.5 cases per 1000 pediatric hospital admission, whereas a recent multicenter report stated it between 0.05 and 0.12 cases per 1000 pediatric admission. In 2013, Rushani and colleagues reported CHD as the dominant underlying condition associated with IE with the cumulative incidence of 6.1 per 1000 children. The survival rate has increased from 47% between 1930 and 1959 to 95% between 2000 and 2003 thanks to advanced care.

Over the past 80 years, the viridans group of streptococci and *Staphylococcus aureus* remain dominant organisms in pediatric IE. The dominance has changed from streoptococcal species to *S aureus*. Between 1930 and 1959, *S aureus* was the cause of IE in 17%, in contrast 68% between 2000 and 2003, which reflects the changing risk factors of IE. In addition, Enterococcus is important cause of nosocomial infection, and fungal endocarditis can be seen in neonates with chronic indwelling central catheter.

Before surgical therapies were established, unrepaired CHD and rheumatic heart disease dominates the underlying disease of IE. CHD underlay 60~75% of all cases and the remaining cases were rheumatic heart disease. Uncomplicated ventricular septal defect comprised a significant portion of the death, whereas cyanotic CHD accounted for only 6% to 20 % of IE lesions. Streptococcal species accounted for 45~65% of pediatric IE cases.

The establishment of open and closed heart surgery made complex heart disease important cause of IE as well as simple heart disease. Between 1977 and 1992, more than half of the cases of IE were surgically treated CHD. Following cardiac surgery, the highest risk group of IE was those with aortic valve stenosis especially with a prosthetic valve replacement. During this time, one-third of cases were with *S aureus*, one-third *Staphylococcus epidermidis*, and one-third alpha-hemolytic streptococci.

Currently, with advanced surgical and catheter therapies for CHD, the overall risk of IE has decreased. But, cyanosis and postoperative states are still important cause of IE. As catheter-based interventions have become more common, concern for these patients has been also emerging. On the other hands, critically ill children with normal heart such as premature babies on intravenous catheter remain at high risk for IE.