

Single-center experience with mechanical valve replacement in children and adolescents: a lifelong challenge

*Verbeke J., Bové T., De Groote K., Vandekerckhove K., Panzer J., De Wilde H., De Wolf D., De Backer J., Demulier L., François K.
University Hospital of Gent - Gent - Belgium*

Introduction: Although valve repair is the preferred treatment of valve diseases in children and adolescents, valve replacement is sometimes unavoidable. The purpose of this study is to evaluate the late clinical and valve-related outcome of a pediatric population with a mechanical valve prosthesis.

Methods: Retrospective investigation is performed of all patients, treated with a mechanical prosthesis before the age of 20 years, for a congenital or acquired heart valve disease during past 2 decades. Analysis focused on late outcome in terms of survival and freedom from valve- and anticoagulation(AC)-related events.

Results: The study population comprised 41 patients, with a mean age of 11.6 y(95%CI 7.6-15.5), presenting dysfunction of the mitral(56%), aortic(24%), tricuspid(10%), pulmonary(5%) or multiple valves(5%). Etiology was primarily congenital in 80%, rheumatic in 12%, genetic in 5% and infectious in 3%. The majority of children(83%) underwent already previous valve surgery, of whom 39% more than 1 procedure. Survival at 20 years was 76±10%. Within a mean follow-up time of 9(95%CI 5-14) years, 43% of the patients remained free from any valve-related event, which were predominantly thrombo-embolic(20%), prosthetic dysfunction (17%), endocarditis(14%) and major bleeding(6%). Late valve-related reoperation was required in 39% of the patients for prosthesis outgrowth(33%), prosthesis dysfunction(3%) and endocarditis(3%). AC-related events were observed in 46%, of which occurred in 73% of the patients showing an INR variability ≥30%. Patients with INR-selfmonitoring (n=5) showed lower INR variability compared to INR control by the local physician: INR variation was 29±21% versus 43±21% (p=0.05). Patients with selfmonitoring demonstrated no AC-related event: 0% versus 50% (p=0.04). The rate of serious adverse events, including death, is 66% of all patients in follow-up.

Conclusion: This single-center study confirms that 2/3 of the patients receiving a mechanical heart valve prosthesis during childhood experience at least one serious adverse event during later life. Half of these events are related to the need for anticoagulation, through showing a high INR-variability in this young population. Self-monitoring of INR might decrease this specific complication rate, yielding however the limitation of possibly including a selection bias.