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Risk Factors for Pericardial Effusion After Cardiac Surgery in Children – A 17-year Retrospective Survey

*Alsafi Z. (1), Maxedius A. (1), Tran P.K. (2), Johansson Ramgren J. (2), Liuba P.(1)
Pediatric Cardiology (1) and Cardiac Surgery (2), Pediatric Heart Center, Skåne University Hospital
and Lund University, Lund, Sweden*

Background: Although postoperative pericardial effusion (postopPE) is a well-recognized complication after cardiac surgery in children, there is a very limited number of studies assessing its prevalence and risk factors.

Methods: A retrospective single-centre survey of all children who underwent surgery for CHD between January 2001-October 2017 and who required PE drainage within the first 30 days after surgery was conducted. Demographics, cardiac and surgical data, as well as PE drainage data including time from surgery to PE drain insertion, duration of postopPE and eventual relapse were obtained from the hospital's digital database. Right atrial (RA) and left ventricular diameters and areas were measured from echocardiographic digital scans obtained before the cardiac surgery and upon drain removal in all biventricular patients with surgery during 2008-2017. Data is expressed as median and range.

Results: Of nearly 5500 pediatric cardiac surgeries over the last 17 years, 126 patients (0.02%; age 0.7(0-16) years; weight 6(1-80) kg; 69 (55%) girls) needed pericardial drainage at 10(0-29) days after surgery with a drainage time of 2.5(1-24) days. The vast majority (n=114 (90%); age: 0.9(0-16) years; 61(54%) girls) underwent cardiopulmonary bypass (CPB) surgery. Of these, 70 patients (61%; age 1.1(0-16) years; 33(46%) girls) had surgery for non-shunt lesion as primary lesion, whereas VSD or complete AVSD was the primary lesion in 30 of 44 patients (68%) with shunt surgery. Among CPB patients, there was no significant difference in surgical age, gender, time between surgery and postopPE drainage and drainage duration between the non-shunt and the shunt groups ($p>0.1$). Longer need of pericardial drain (≥ 7 days) was encountered in 15 (13%) CPB patients and was associated with male gender ($p=0.04$) and elevated CRP on days 1 and 2 postoperatively ($p=0.02$ for both). Later onset of postopPE (≥ 14 days) was encountered in 22 (19%) CPB patients and was associated with decrease in RA area ($p=0.02$).

Conclusion: PostopPE after pediatric cardiac surgery is a rare complication occurring mostly in young patients after CPB surgery with later onset associated with postoperative decrease in RA size, and longer need for drainage associated with male gender and early postoperative inflammatory response.