

**Mortality after cardiopulmonary resuscitation events occurring after paediatric cardiac surgery is associated with procedure complexity**

*Kramer P., Miera O., Photiadis J., Berger F., Schmitt K.R.L.  
German Heart Center Berlin, Germany*

**Objectives:** Children after cardiac surgery have an increased risk for cardiopulmonary resuscitation (CPR) events while survival after CPR in these patients is reported to be higher compared to other arrest aetiologies. In the present study, we wanted to assess the institutional incidence and outcomes of CPR events after paediatric cardiac surgery and identify risk factors for mortality.

**Methods:** In a retrospective review of the past decade from 2007-2017, we identified all children <18 years of age who experienced CPR events after cardiac surgery in our institution. Clinical variables and outcomes were analysed.

**Results:** A total of 232 children (median age 0.31 [IQR 0.05-0.63] years) required CPR after cardiac surgery (incidence 4.9%). Univentricular heart malformation was present in 73 patients (31.5%). In 49 patients (21.1%) extracorporeal membrane oxygenation was established during CPR (ECPR) and a total of 79 patients (34.1%) requires any type of mechanical circulatory support during hospital stay. Surgical procedures were generally complex with median STS-EACTS procedure risk category 4 [IQR 2-4]. Survival to discharge was 71.1% (n=165) and survival with good neurological outcome was 62.9% (n=146). Mortality was associated with several resuscitation variables (longer duration of CPR, higher lactate, lower pH, ECPR), patient variables (younger age, univentricular heart malformation) and procedural risk as assessed by STS-EACTS mortality risk score and category (all  $p < 0.001$ ). In multivariable analysis, STS-EACTS mortality risk category was an independent risk factor for mortality together with CPR duration, higher lactate, lower pH and requirement of any type of mechanical circulatory support during hospital stay, while age, univentricular heart malformation and ECPR were not associated with increased mortality risk.

**Conclusions:** Overall survival and neurological outcome in children with CPR events after paediatric cardiac surgery is good. Interestingly, univentricular heart disease and requirement of ECPR were not independent mortality risk factors in multivariable analysis. Procedural risk of preceding cardiac surgery, however, is an independent risk for mortality and consequently, comparison and appraisal of resuscitation outcomes has to take this factor into account.