Percutaneous closure of atrial septal defects in children under deep conscious sedation and spontaneous breathing - a feasible and safe concept

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BACKGROUND: Interventional cardiac catheterization (CC) is usually performed under general anaesthesia and endotracheal intubation. However, as CC in children under deep sedation and spontaneous breathing has been proved to be a feasible concept, percutaneous closure of atrial septum defect (ASD) without general anaesthesia is nowadays attempted in a growing number of children.

OBJECTIVES: To objectively evaluate the success and complication rate of percutaneous ASD closure in children under deep conscious sedation and spontaneous breathing.

METHODS: Retrospective analysis of all consecutive children undergoing percutaneous ASD closure at a tertiary care paediatric cardiology centre. Study patients received premedication with intravenous (i.v.) midazolam, followed by i.v. ketamine for sedation induction and propofol continuous infusion for the procedure as standard medication.

RESULTS: Median age of study patients 6.1 years (minimum 0.5; maximum 18.8), and median body weight was 21.6 kg (5.3; 92). Median cumulative midazolam dose was 0.08 (0.02; 0.18) mg/ kg body weight, median ketamine dose during CC was 2.7 mg/ kg (minimum 0.3; maximum 7), and median propofol infusion continuous infusion rate was 5 mg/ kg/ h (1.1; 10.7). After transoesophageal echocardiography and balloon sizing of the defect, percutaneous ASD closure was attempted in 174 patients and device implantation performed successfully in 163 patients (94%). There were no major cardiorespiratory complications associated with deep sedation, and only two patients (1%) required endotracheal intubation during CC due to bronchial obstruction. Seventeen patients (8%) had minor respiratory complications and required frequent oral suctioning or temporary mask ventilation. Median length of inpatient stay after CC was 2 days (1; 32).

CONCLUSIONS: Percutaneous ASD closure can be performed safely and with high success rates under deep conscious sedation and spontaneous ventilation in children.