Pulmonary Hypertension and Anesthesia Risk -Where Are We Now?

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Introduction

Children with Pulmonary hypertension (PH) are at increased risk of mortality secondary to acute pulmonary hypertensive crisis or right ventricular ischaemia. The reported risk of anesthesia mortality/major mortality is 4.5-7.3. 1, 2 The risk is higher with suprasystemic PH. Current anesthesia mortality and morbidity rates are quoted from single centre data of cases from 1999-2004. Since 2000, long-term oral treatments of phosphodiestrase inhibitors (e.g. sildenafil) and endothelin receptor antagonists (e.g. bosentan) have been approved and used for the treatment of PH associated with pulmonary hypertension. Both have shown an improved exercise capacity, WHO functional class, reduced symptoms and there is evidence that they improve survival. 3, 4 We hypothesised long-term treatment with bosentan and/or sildenafil will lessen the currently quoted anesthesia mortality rate of 6%.

Methods

This retrospective review was approved by the Institutional Ethics Committee. REB #10300213. Medical records of children with pulmonary hypertension who underwent general anesthesia or sedation for non-cardiopulmonary bypass procedures from 2008-2012 were reviewed. Data was collected for 122 patients undergoing 284 procedures. Each anesthetic was performed within two years of the surgical date. Pre-anesthesia echocardiographic results and right heart catheterisation were included if performed within three years of the surgical date. Electrocardiograms were examined for evidence of right heart strain and right ventricular hypertrophy. The type of surgical procedure, anesthetic management, including induction drugs and airway technique were recorded. The incidence and type of complications that occurred intra-operatively and death (up to 7 days post-operatively) were also collected. Major complications were defined as hypotension, hypoxia or arrhythmia occurring operatively and death (up to 7 days post-operatively) were also collected. Limitations of this study are that it is retrospective and a relatively small sample size.

Results

Clinical Characteristics

- Preliminary results are presented here. There were 284 consecutive procedures in 122 patients (30 males and 92 females reviewed). Median age 4-yr (range 0.1-17 yr) and median weight 16 kg (range 0.8-32 kg).
- Of 122, 73(60%) had PH secondary to congenital cardiac defects, 20 (16%) due to chronic respiratory disease, and 18 (15%) due to idiopathic PH. Data on severity of PH was present for 213 (77%) procedures. Suprasystemic PH was present in 24 (9%) and Systemic PH was present in 19 (8%).
- Anti-PH specific therapy was present in 55 (4.9%) patients and 121 (43%) procedures.
- 5 of 121 (4%) patients had more than one type of PH treatment. Limitations of this study are that it is retrospective and a relatively small sample size.

The overall risk of major complication and/or death has not changed but there does appear to be a trend towards improved outcomes in those patients receiving second-generation anti-pulmonary hypertension therapies.

References