

Pediatric Cardiology

Initial Experience in Cardiovascular Surgery with Cardiopulmonary Bypass in Premature Newborns Weighing Less than 2500 Grams

Christián Kreutzer, Daniel A. Klinger, Sergio Bariero, Gabriel Musante, Alejandro Siaba, Thomas Iolster, Silvio Torres, Jorge L. Gentile, Augusto Gutiérrez, Alejandro Peirone, María L. Bergamini

Background

Despite the sustained progress in neonatal cardiovascular surgery in the last 30 years, premature newborns with congenital heart defects pose an additional challenge to the multidisciplinary team taking part in the intervention due to the frequent association with comorbidities and low weight. Unlike historical strategies, and imitating successful approaches reported in the last decade, we have been performing corrective surgeries in symptomatic patients since 2007, irrespective of weight and age, in order to improve their cardiac status and thus overcome the associated comorbidities.

Objective

To report the initial experience in cardiovascular surgery (CVC) with cardiopulmonary bypass (CPB) in newborns weighing less than 2500 grams.

Material and Methods

From May 2007 to May 2009, 11 newborns underwent CBP surgery. Mean age was 24 days (4 to 90 days), gestational age was 34 weeks (32 to 37) and mean weight was 2.27 kg (1.7 to 2.5). Before the intervention, 7 patients were under mechanical ventilation (MV) and 9 were receiving inotropic drugs. The diagnoses were ventricular septal defect (n = 4, one with severe coarctation of the aorta), total anomalous pulmonary venous drainage (n = 2), transposition of the great arteries (n = 2), pulmonary atresia with intact ventricular septum (n = 1), pulmonary atresia with ventricular septal defect (n = 1) and hypoplastic left heart syndrome (n = 1). Patients underwent either deep hypothermic circulatory arrest with a rectal temperature of 18 °C with intermittent flow perfusion (n = 8) or continuous flow perfusion with a rectal temperature of 28 °C (n = 3). Biventricular correction was performed in 10 patients and 1 patient underwent the Norwood procedure.

Results

The sternotomy remained opened in 8 patients; mean time to closure was 3.5 days (3 to 5). Three patients with unremitting bleeding required therapy with factor VII. Mean duration of MV was 7.5 days (2 to 20). Bleeding (n = 5), sepsis (n = 2) and chylothorax (n = 1) were the most frequent complications.

There were no early deaths and only one patient died during late follow-up of sepsis due to *Candida albicans*. Nine survivors are in good general condition free from symptoms and one patient presents compensated heart failure.

Conclusions

The initial outcomes of cardiovascular surgery with CPB in newborns are promising, yet the initial morbidity is high.