

SCA 84

**EFFECTS OF PHENOXYBENZAMINE IN FOUR DIFFERENT AGE GROUPS**

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**Introduction:** Phenoxybenzamine (POB), an alpha-adrenergic receptor blocker, is used to improve cardiopulmonary bypass (CPB) flows, decrease metabolic acidosis, and cellular response to stress in children (1,2,3). We reviewed our clinical experience comparing the effects of POB on cardiopulmonary bypass flows and temperature gradient in different age groups.

**Material and Methods:** The records of one hundred pediatric patients who underwent surgical repair of congenital cardiac lesion under CPB were reviewed. Patients were selected randomly in four age groups: 0-1 month, 1-12 months, 1-5 years, and 5-15 years. All patients >5 years, received a full dose of POB 1 mg/kg at the initiation of bypass. Patients older than five years did not receive POB, but received alternative vasodilators (nitroprusside, SNP or nitroglycerine NTG), and were used as a comparison group. Data abstracted included: demographic data, diagnosis, procedure, CPB duration, mean arterial pressure on CPB, flow on CPB, hematocrit, base deficit and core-to-skin temperature gradient [T(c-s)]. Systemic vascular resistance index (SVRI) was calculated for all the patients. Data are presented as mean+/-SEM and analyzed using a student t-test.

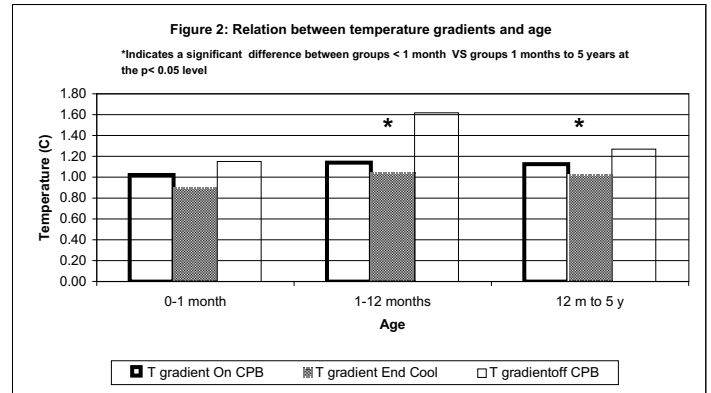
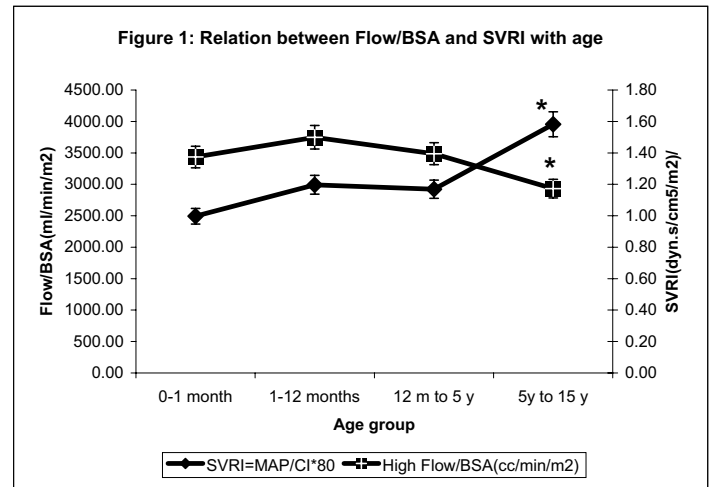
**Results:** There was a statistically significant difference between the groups in weight and body surface area. There was a significantly longer CPB duration between the age group 0-1 month compared to the three older groups (Table 1). The ratio CPB flow/BSA (ml/min/m<sup>2</sup>) and the SVRI were significant different in the age groups >5 years compared to 5-15 years (Table1 and Figure 1). The T(c-s) on starting CPB, at the end of cooling and coming off CPB were significantly higher between 1 month to 5 years versus less than 1 month old (Figure 2).

**Discussion:** The effect of POB on CPB flow/BSA and SVRI varies with age. Smaller patients have a higher flow and a decreased SVRI on CPB. Patients receiving POB have a higher flow rate and a decreased SVRI versus older children who received alternative vasodilator therapy. The T(c-s) were wider between 1 month-to-five years than the < 1 month old. This could be explained by a more dramatic effect of POB in smaller patients allowing an even rewarming. POB effectiveness decreased with age in direct relation with the increased density and availability of alpha receptors.

**Conclusion:** The effect of POB in CPB flow/BSA and SVRI varies with age, with smaller patients having the highest flow and lowest SVRI, and the narrowest core-to-peripheral temperature gradient.

**References:**

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2. M Kapural, DeFilly D, Drummond-Webb J et al. The effects of phenoxybenzamine on organ perfusion during cardiopulmonary bypass and circulatory arrest. *Anesth Analg* 2000;90,SCA-42
3. Tweddell JS, Hoffman GM, Fedderly R, et al: Phenoxybenzamine improves systemic oxygen delivery after the Norwood procedure. *Ann Thorac Surg* 1999;67:161-168



	0-1 month	1-12 months	1-5 years	5-15 years	p value *
Weight (kg)	3.11	5.93	13.27	39.66	<0.0001 <sup>1</sup>
BSA (m <sup>2</sup> )	0.19	0.3	0.55	1.2	<0.0001 <sup>1</sup>
CPB duration	120.5	93.4	95.4	97.7	0.0439 <sup>2</sup>
CPB flow/BSA (mL/min/m <sup>2</sup> )	3.45	3.74	3.48	2.93	<0.0001 <sup>3</sup>
SVRI	997.31	1196.98	1168.83	1582.26	<0.0001 <sup>3</sup>