

## Non-invasive monitoring of microcirculation in paediatric patients suffering from septic shock

Banille E., Paz G., Cacciamano A., Ballaco M., Luján L., Resino C., Lazzarín O., Peirone A.  
Paediatric Intensive Care Unit. Children's Hospital of Córdoba, Argentina.

### INTRODUCTION

Oxygen related variables and diastolic blood pressure (DBP) allow to estimate the systemic vascular resistance (SVR). Low central venous oxygen saturation (ScvO<sub>2</sub>), and an increase in the arterial-venous difference saturation (AV dif sat O<sub>2</sub>) as well as in the systemic oxygen extraction index (SO<sub>2</sub> ext index) indicate ↑SVR. An increase in ScvO<sub>2</sub> and a decrease in AV dif sat O<sub>2</sub> and DBP, indicate ↓SVR.

### OBJECTIVES

To identify hemodynamic trends and assess pharmacological strategies in pediatric patients with septic shock.

### METHODS

Retrospective - descriptive and observational study. Between January 2008 and December 2009, 35 patients (p) were enrolled (p) in the present study with diagnosis of septic shock (23 males), with an average age of 14 months (range: 1 month to a 15 years).

### RESULTS

**Group A** (non-hyperdynamic shock): 24 p, 17 had myocardial dysfunction and 3 had hypovolemic state. 10 p showed isolated hypovolemia. Systolic blood pressure (SBP) < P5 and DBP > P50. ScvO<sub>2</sub>: 53,4%; AV dif sat O<sub>2</sub>: 40,9%; SO<sub>2</sub> ext index 0,43, AV dif CO<sub>2</sub>: 10,7 mm Hg and ↑lactate. Fluid administration (10-60 ml/kg) and vasodilators (dobutamine: 6 p, dopamine + milrinone: 8 p and epinephrine: 4 p) were started. 8 p shifted to group B, 3 p improved with norepinephrine, 3 p with methylene-blue and 2 p with terlipresine.

**Group B** (hyperdynamic shock): 11 p, 5 p had myocardial dysfunction and 3 p with hypovolemic state. Normal SBP and DBP < P5; ScvO<sub>2</sub>: 75,3 %; AV dif sat O<sub>2</sub>: 19,9%; SO<sub>2</sub> ext index: 0,21; AV dif CO<sub>2</sub>: 9,1 mm Hg and ↑lactate. All p received vasopressors (dopamine + norepinephrine). 2 p showed refractory vasoplegic septic improving with methylene-blue.

Overall mortality was 8 p (28%).

Variable	Group A	Group B	p value
ScvO <sub>2</sub>	53,4 ± 5,25	75,3 ± 1,25	0,00001
AV dif sat O <sub>2</sub>	40,9 ± 3,02	19,9 ± 1,53	0,00001

### CONCLUSION

- 1) ScvO<sub>2</sub> and oxygen derives variables allow to assess the microcirculation.
- 2) Detection of hemodynamic trends lead to a rational drug support and fluid administration.
- 3) Methylene-blue administration emerges as an attractive alternative in p with refractory vasoplegic shock.