Impact of Severe Acute Hypercapnia on the Cardiovascular Responses to Refractory Septic Shock in Children

Cristina Mangia; Nilton Ferraro Oliveira; Cintia Johnston; Maria Cristina Andrade

1 Pediatric and Neonatal Intensive Care Unit at Escola Paulista de Medicina, Universidade Federal de São Paulo, São Paulo, Brazil
2 Nephrology Division at Escola Paulista de Medicina, Universidade Federal de São Paulo, São Paulo, Brazil

Objective: To report the effects of severe acute hypercapnia on vascular system in children with refractory septic shock and acute respiratory distress syndrome.

Methods: A 8-year-old girl was admitted with fifty-two days history of fever and cough prior to hospital admission. After 15 days of hospitalization was admitted to the pediatric intensive care unit (PICU) with septic shock and acute respiratory distress syndrome secondary to necrotizing pneumonia. Seven days after PICU admission keeping in refractory septic shock to dopamine, dobutamine, epinephrine and vasopressin, we opted for hemodynamic monitoring by Swan-Ganz catheter for optimal cardiovascular support.

Results: Children was kept under pressure control mechanical ventilation. In this condition the Swan-Ganz catheter analysis showed temperature (°C) 37.9± 0.71 (CI 95% 37.9–38); Heart rate (bpm) 143 ± 8.3 (CI 95% 136–150); Mean Arterial Pressure (mmHg) 72 ± 10 (CI 95% 63–80); Pulmonary Artery Systolic Pressure (mmHg) 41±18.3 (IC95% 26–56); Cardiac Index (L/min) 10 ± 0.68(CI 95% 9.49–10.6); Stroke Volume (ml) 56 ±5.6 (CI 95% 51.7–61.1); Systemic Vascular Resistance (dynes) 494 ±163 (CI 95% 358–631); Pulmonary Vascular Resistance (dynes) 158 ±15 (CI 95% 145–171); arterial pH 6.9±0.02 (CI95% 6.9–7.02); PaCO2 88.9 ±14.3(CI 95% 76–100); PaO2/FiO2 ratio 39.8±4.3 (CI95% 36–43); HCO3 (mmol/L) 20.7±2.3 (CI95% 18.7–22.7); BE - 11.38±1.1 (CI 95% 11–12); venous SatO2 (%) 53 ± 6.3 (CI 95% 48–59).

Conclusion: In this case of Septic Shock, hypercapnia had similar effects to hyperdynamic shock on cardiovascular function the optimal adrenergic support in this cases hasn’t been established.1

1 Am J Respir Crit Care Med 2008;177:178