Down Regulation of Adrenergic Receptors in Pediatric Septic Shock
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Septic shock is characterized by SIRS associated to infection. The hemodynamic disorders associated to Septic Shock include vascular dysfunction. It is attributed to microvascular an endothelial dysfunction and decreased responsiveness to catecholamine. In this scenario, hydrocortisone could restored alpha-adrenergic reactivity once endogenous steroids are known to play a role in the modulation of vasomotor tone.

To report a case of down regulation of adrenergic receptors in pediatric septic shock.

Case: The 8-year old boy with Lowe syndrome was admitted to the pediatric intensive care unit (PICU) with septic shock of abdominal origin.

In the first hour of admission received 20 ml / kg saline solution and dobutamine 5 µg/kg/min for central access.

After three hours of ICU admission, had cardiac arrest introduced epinephrine 0.2 µg/kg/min plus dobutamine 15 µg/kg/min. After 4 hour, presented new cardiac arrest and introduced norepinephrine of 0.4 µg/kg min.

At 10th day, he presented with refractory septic shock. The echocardiogram found left ventricular hypokinesis and ejection fraction less than 30%. Then we thought to down regulation of adrenergic receptors. Milrinone was introduced 0.3 microgram/kg/min and epinephrine adjusted to 1 microgram/kg/min. Simultaneously was introduced hydrocortisone to stabilize endothelial function (loading dose 50mg/kg plus maintenance 3 mg/kg/day). We exchanged sedation to morphine 0.1 mg/kg/dose to produce histamine release and fresh frozen plasma to try to produce vasodilatation. Child presented improvement of peripheral perfusion showing harm shock BP 94/64 mmHg, he died as consequence of hemorrhagic shock on the 28th day of hospitalization.

Low vascular reactivity, which may lead to refractory shock and death, is linked to desensitization or down-regulation of alpha-1 adrenergic receptors. The best vasopressor requirements to restore adequate BP isn´t clear. Administration of cyclic AMP specific phosphodiesterase (PDE) inhibitor is a option in these cases. Hydrocortisone could be to improve hemodynamics, the exact effects isn´t only related to adrenocortical insufficiency.