Reviewer’s report

Title: Role Of Vasopressin In The Treatment Of Anaphylactic Shock In A Child Undergoing Surgery For Congenital Heart Disease: Case Report

Version: 2 Date: 13 November 2007

Reviewer: stefano romagnoli

I am familiar with the literature and believe that this case meets one of the 7 criteria for evaluation in the journal: An unexpected event in the course of observing or treating a patient

Has the case been reported coherently?: Yes

Is the case report authentic?: Yes

Is this case worth reporting?: Yes

Is the case report persuasive?: Yes

Does the case report have explanatory value?: Yes

Does the case report have diagnostic value?: No

Will the case report make a difference to clinical practice?: Yes

Comments to authors:

General
The authors describe the case of a patient who was undergoing pediatric heart surgery with an anaphylactic reaction to heparin that was refractory to epinephrine infusion but effectively treated with arginine-vasopressin.

This report is interesting since the arginine-vasopressin has been rarely administered to treat a vasodilatory shock due to anaphylactic reaction and it never has been administered in pediatric heart surgery.

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Revisions necessary for publication

Major comments:

Page 3; line 13-14

“In order to re-establish hemodynamic stability, volume resuscitation was started (30 ml/Kg) and two intravenous (i.v.) boluses of 500 mcg of epinephrine were given...”
In consideration to the specific setting (Cardiac Surgery operating room), how did you establish the doses? How much time elapses from the first dose?

Page 3; line 19-20

“The finding of metabolic acidosis (pH 7.23) with increased lactate levels (9 mmol/L) suggested inadequate systemic oxygen delivery”.

According to the above sentence, a raising of blood lactate, indicating tissue hypoxia, is caused by an inadequate DO2 (anaerobic metabolism).

Nonetheless, the amount of oxygen available to the cells is determined by a number of central and peripheral factors. Central factors are related to the cardiorespiratory function (cardiac index and PaO2) and to the Hb concentration (DO2 = CI × CaO2); peripheral factors are related to the distribution of cardiac output to the various organs and to the regulation of the microcirculation that can be substantially altered in several conditions (i.e. distributive shock) where local control of vascular tone is altered and the formation of edema may contribute to damage the distribution of blood flow.

During the described condition, the “macrocirculatory” parameters were adequately controlled (high-flow CPB and adequate Hct) but the increase in blood lactate concentration was only partially controlled, indicating that a normal or elevated DO2 felt below a critical value, with successive VO2 reduction, mainly due to an altered oxygen extraction capabilities.

The authors should therefore remark in the discussion that the observed metabolic acidosis was derived from a poor tissue perfusion due to severe hypotension-low perfusion pressure (CPB perfusion pressure 20 mmHg with SVRI 470 dyne×sec/cm5/m2) rather than an inadequate DO2 only.

Page 3; line 23

“Moreover, epinephrine infusion was started at a dose of 0.1 mcg/Kg/min in order to achieve a perfusion pressure of 40 mmHg” and

“…weaning from CPB failed because of severe hypotension despite epinephrine administration was titrated up to 0.3 mcg/Kg/min”.

Vasoplectic shock requiring vasopressor support is a recognized and relatively common complication during and after cardiopulmonary bypass. In the case described in your manuscript the pathogenesis of vasodilatory shock is rather different or nevertheless multifactorial.

An association of two or more drugs is a frequent measure used to treat a resistant vasodilatory shock (norepinephrine, high dose dopamine, phenylephrine, angiotensin II, methylene blue); taking into account the existing controversy on which agent should be preferably used, why was arginine-vasopressin your first-line intervention after epinephrine?

Page 4; line 10

“Vasopressin was progressively reduced and stopped after 6 hours infusion and
epinephrine reduced and stopped in 12 hours”

What was the mean arterial pressure (or other) target you chose where de-escalating the arginine-vasopressin and epinephrine infusion?

What was the mean reduction per hour of arginine-vasopressin and epinephrine doses?

Did you monitor heart function by means of echocardiography during the weaning from epinephrine?

Page 4; line 17-19 - Page 3; line 15

“The cardiovascular collapse due to anaphylaxis is a vasodilatory shock, characterized by an abrupt fall in systemic vascular resistance, enhanced vascular permeability and intravascular volume depletion”. In the text you state: “CPB was instituted in 5 minutes in order to improve patient organ perfusion”.

Please specify in the discussion section what is the mechanism(s) by which CPB could restore organ perfusion in the setting of vasodilatory shock.

Minor comments:

Page 2; line 25
Please replace 0,2 with 0.2; 0,2 with 0.2; 0,5 with 0.5.

Page 2; line 26
Please insert (i.v.) after intravenous (and delete i.v. in page 3; line 13)

Page 3; line 1
Please replace 0,25-0,5 with 0.25-0.5; 0,2 with 0.2; 0,2 with 0.2.

Page 3; line 11-12
“Airway pressure increased to 38 mmHg with the clinical finding…”

The International System of Units (Guide for the Use of the International System of Units. BN Taylor 1995) indicate to express Pressures in Pa. Please substitute mmHg in Pa or in the widely accepted cmH2O. 38 mmHg = 54.6 cmH2O = 5.06 KPa.

Page 3; line 16
Please replace 3,3 with 3.3.

Page 3; line 16
Please replace pH 7,23 with pH 7.23.

Page 3; line 18
Please substitute the symbol of seconds (sec) with s (SI base units)

Page 3; line 24
Please replace 5,1 with 5.1.
Please replace vital parameter with vital parameters.

Please replace minute with minutes.

Is MAP for mean arterial pressure? Is it the perfusion pressure? Please specify.

Please substitute the symbol of seconds (sec) with s (SI base units)

Please replace hemodynamic with hemodynamic.

Please replace resistance with resistance.

**What next?:** Revise and resubmit

**Quality of written English:** Acceptable