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LETTER TO THE EDITOR

Hydrocortisone for refractory hypotension of very low birth weight infant with patent ductus arteriosus: a case report

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To the Editor:

A male infant weighing 1,090 g, 28 weeks of gestation, was scheduled to take a ligation of a patent ductus arteriosus (PDA). Eight days after birth, mean arterial pressure (MAP) has fall to <30 mmHg. We started with dopamine (5–10 μg/kg/min), to maintain the blood pressure, but this was not successful. Although we did not confirm an adrenal insufficiency (AI), we decided to start medication of hydrocortisone, 3 mg/kg/day, which resulted in over 50/35 mmHg. The hydrocortisone was tapered for 3 days because MBP was maintained at >40 mmHg, and 5 μg/kg/min of dopamine was maintained until the day of surgery. At 31 days after birth, we induced anesthesia with 2 mg/kg of ketamine, 20 μg/kg of fentanyl, and 0.9 mg/kg of rocuronium without premedication. Anesthesia was maintained by a continuous infusion of ketamine (1 mg/kg/h) and intermittent rocuronium in 50% O_2 with air. After ligation of a PDA, MAP was decreased to 30 mmHg by degrees which required an increase to 10 μg/kg/min of dopamine and the addition of 5 μg/kg/min of dobutamine to maintain over 30 mmHg. An echocardiogram showed globally normal contractility without a PDA. In spite of our efforts, mean blood pressure had fallen to 24 mmHg at 6 h after ligation. The patient was commenced on intravenous hydrocortisone (3 mg/kg/day), which increased MAP to above 30 mmHg and heart rate to 172 bpm after 90 min. After 4 h, MAP was maintained over 50 mmHg and heart rate was 190 bpm. Two days after surgery, the dopamine, dobutamine, and hydrocortisone were tapered and the blood pressure was maintained until discharge.

Hypotension of very low birth weight (VLBW) premature infants is a major factor of morbidity, and mortality. Inotropes such as dopamine and dobutamine are widely used to normalize blood pressure but more than 50% of hypotensive VLBW infants requiring dopamine at doses >10 mg/kg/min develop refractory hypotension (RH) that is resistant to vasopressor [1]. Hydrocortisone is beneficial in treatment of RH, but the mechanisms are not completely understood. Down-regulation of cardiovascular adrenergic receptors and the development of relative adrenal insufficiency are thought to be the factors that may explain the corticosteroid responsiveness of RH [2, 3]. Cardiovascular response to catechol amines is attenuated due to down-regulation of the cardiovascular adrenergic receptors in VLBW infants with critical illness [2]. Moreover, VLBW infants have low adrenal reserves and reach a relatively adrenal insufficiency (AI) state in stressed situations [4]. Watterberg et al. [5] has reported hydrocortisone (1 mg/kg every 8 h) was effective for VLBW infants with AI. In this case, the infant had RH in spite of the treatment with inotropes after birth and PDA ligation, and we successfully treated him with hydrocortisone. Thus, we recommend that early hydrocortisone therapy be administered to VLBW premature infants for perioperative RH resistant to inotropes..

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