EXCHANGE TRANSFUSION: AN EXTRA THERAPEUTIC TOOL FOR SEVERE PERTUSSIS

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Introduction

Bordetella pertussis is a common, under-recognized, and vaccine-preventable cause of critical illness with a high mortality in infants worldwide. Severe pertussis is characterized by refractory hypoxemia, pneumonia, cardiogenic shock and requires intensive care. When pertussis is associated with hyperleukocytosis, mortality rate approaches to 80% with the degree of leukocytosis consisting an independent predictor of death. It is proposed that severe leukocytosis may contribute to pulmonary hypertension by blocking pulmonary capillaries and restricting blood flow.

Case Description

A 2.5 month-old girl admitted to PICU due to an apnoeic cyanotic episode. She had presented cough, rhinitis and poor feeding for 10 days and *B. pertussis* had been detected by PCR on nasal secretions. She presented a second apnoeic cyanotic episode with bradycardia and was intubated. Due to severe and persistent hypercapnoea, she was ventilated in high frequency oscillatory ventilation with no amelioration. As she presented leukocytosis and hemodynamic instability with tachycardia, she underwent a double volume exchange transfusion through a central line, and white blood cells reduced from 72,000/ μ L to 19,000/ μ L. The benefits of the procedure were clear and immediate, as the respiratory parameters improved and the heart rate stabilized in normal range in less than 24 hours.

Although the course of the infant was prolonged, the outcome was favorable.

Conclusion

Exchange transfusion should be considered as a useful therapeutic tool in children with severe pertussis and severe leukocytosis before shock has occurred.

Figure 1. Main variables before and after Exchange Transfusion

Table 1. Clinical and laboratory variables before and after Exchange Transfusion

Variable	Before ET	After ET
Pulse (bpm)	225	165
Blood pressure (mmHg)	135/75	120/50
Temperature (°C)	36	38.3
Respiratory rate per minute (ventilated)	33	33
Fraction of inspired oxygen	90/69(HFO)	70
PO2/FiO2	89	203
WBC count ($\times 10^9$ cells/L)	71,59	19
Hb (g/dL)	11,6	15,5
Hct (%)	36	48,1
Platelets ($\times 10^9$ cells/L)	579	122
Neutrophils (%)	43	45
Sodium (mmol/L)	140,8	138
Potassium (mmol/L)	3,9	138
Calcium (mg/dL)	9,4	8.1
Glucose (mg/dL)	101	
Blood urea nitrogen (mg/dL)	5	10
Creatinine (mg/dL)	0,4	0,5
pH (mg/dL)	6.93/7.11	7.42
pO2 (mmHg)	128.6/61.3	142.1
Saturation O2 (%)	96/81.4	98.8
Bicarbonate (mmol/L)	27.9/27.4	24.9
pCO2 (mmHg)	140.1/89.3	38.2

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There is no conflict of interest