Critical Care | Case Report: NAVA

PATIENT CASE REPORT. CATEGORY: INFANT
MECHANICAL VENTILATION IN THE POSTOPERATIVE PERIOD
OF A NEWBORN WITH CONGENITAL HEART MALFORMATIONS
AND AN ANAL ATRESIA.

Clinical Background and Situation:
A baby boy was born in a local hospital with an anal atresia, which was detected during the routine check of the newborn. He was transferred to the Regional Children's Hospital for further investigations and surgery.

Preoperative heart ultrasound showed a ventricular septum defect, an atrial septum defect, a persistent ductus arteriosus and remaining pulmonary hypertension. Further investigation of the intestines showed a colorectal fistula. His respiratory and circulatory parameters were normal and surgery was then planned on his second day of life.

Interventions and course of therapy:
During surgery, which was a routine procedure, his systemic blood pressure was falling and he was given large volumes of colloids with limited effect. He was otherwise stable during the surgical procedure which, although prolonged, was successfully performed. Postoperatively he was transferred to the pediatric intensive care unit for further stabilisation with mechanical ventilation, pain treatment and sedation by continuous infusions. He was treated with pressure control/pressure support/PEEP with 19/17/5 cm H2O, a set respiratory rate of 32 and FiO2 of 0.6. A postoperative chest X-ray was normal. Arterial blood gases showed hypocarbia and hyperoxia on the initial ventilator settings, which then were adjusted to give normoventilation. Extubation was planned to the following day.

A NAVA-catheter was put in place and the appropriate position was easily confirmed by means of the electrical signals from the diaphragm (Edi). After a 30 minutes registration of the ongoing ventilator settings, at that moment PC/PS/PEEP of 15/11/5, a rate of 17 and an FiO2 of 0.25, he was transferred to NAVA, for an initial 30 minutes treatment. PEEP was kept at 5 cm H2O, FiO2 at 0.25 and the NAVA level set to a low value. During this first period of treatment, his circulation was stable there were no significant changes in arterial blood gases compared to the previous ventilator mode.

Weaning process and results:
After a second baseline registration on PC/PS/PEEP with identical settings, he was again put on NAVA, with the same settings as previously. During this second one-hour treatment, blood gases were still normal, while peak airway pressures fell from 13 to 8 cm H2O and FiO2 could be reduced to room air. This was an evident indication that he was ready to extubate, which was successfully done 15 minutes later. He could be transferred to a regular ward in the following morning.

Case summary:
A newborn baby boy with multiple congenital heart defects and an anal atresia was treated with NAVA as a part of his postoperative treatment and within the frames of a feasibility study. The NAVA-treatment was successfully performed and the airway pressures and arterial blood gases indicated that he was ready to extubate, which was successfully done after one-hour treatment in immediate relation to the study. No adverse events occurred during the treatment.

This patient was the first baby in the world monitored and treated with NAVA.

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