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Use of inhaled nitric oxide in paediatric cardiac intensive care unit

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Objectives: Inhaled nitric oxide (iNO), a selective pulmonary vasodilator, has been in use for the therapy of pulmonary hypertension (PH) in pediatric cardiac intensive care unit. The main concerns for its use are production of NO₂ and methemoglobin, decreased platelet aggregation and increased risk of bleeding.

Patients and Method: We collected the data of 32 pediatric patients who were treated with inhaled nitric oxide at our pediatric cardiac intensive care unit between 2011 and 2012. Patients were divided into three groups.

Group I; postoperative

Group II; newborns with persistent PH

Group III; primary PH or Eisenmenger syndrome.

Age, sex, weight, primary diagnosis, arterial blood sample, pulmonary arterial pressure, systemic arterial pressure, and oxygen saturation levels were analysed.

Results: There were 25, 3 and 4 patients in group I, II and III, respectively. Eighteen of the patients were male. The median weight was 8 kilograms (3-40 kilograms), median age was 7 months (2 days-10 years). iNO was started 12 hours (1-48 hours) after admitting to the unit and was continued at a median time of 24 hours (12-168 hours). Three patients received iNO under ECMO support. In group-I, the diagnosis were atrioventricular septal defect, total anomalous pulmonary venous connection, ventricular septal defect, and truncus arteriosus.

The systolic pulmonary arterial pressure (PAP) was 40 ± 15 mmHg, systemic arterial pressure (SAP) was 57 ± 18 mmHg, PAP/SAP ratio was 0.69 and oxygen saturation levels were 88% before iNO treatment. After iNO treatment PAP decreased to 24 ± 9 mmHg ($p < 0,05$), and PAP/SAP ratio decreased to 0,4 ($p < 0.05$), SAP did not change (60 ± 12 mmHg), and saturation levels increased to 98% ($p < 0.05$). Methemoglobinemia occurred in all patients but only 3 of them needed treatment adjustment or modification. Thrombocytopenia developed in 2 patients.

Conclusion: iNO seem to be effective drug in reducing pulmonary arterial pressure. During pulmonary hypertensive crisis iNO can be used effectively and safely in pediatric cardiac intensive care units. Clinicians should be careful about methemoglobinemia and thrombocytopenia.