INTRATRACHEALLY ADMINISTERED CORTICOSTEROIDS IMPROVE LUNG FUNCTION IN MECONIUM-INSTILLED RABBITS

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Introduction: Locally administered corticosteroids may diminish lung edema, inflammation, airway hyperreactivity, and pulmonary vasoconstriction associated with meconium aspiration.
Material and methods: Conventionally (f 30/min, Ti 50%, FiO_2 0.21) ventilated adult rabbits received intratracheally 4 ml/kg of saline (Sal group, n=5) or human meconium (25 mg/ml). From this moment, all animals were oxygen-ventilated. When respiratory failure developed, meconium-instilled rabbits received intratracheally budesonide (0.25 mg/kg, 0.5 ml/kg) by inpulsion effect of high-frequency jet ventilation (f 300/min, Ti 20%) 0.5 and 2.5 h after meconium instillation (Mec+Bud group, n=8) or were left without treatment (Mec group, n=8). All animals were conventionally ventilated for additional 5 h after the first treatment dose. Respiratory parameters, blood gases, and white blood cells count (WBC) were analyzed in regular time intervals. Right lungs were used to determine airway reactivity by *in vitro* method, lung edema by wet/dry weight ratio, and oxidative damage to lipids and proteins by estimation of thiobarbituric acid-reactive substances, tyrosine and lysine in the lung homogenate. Left lungs were saline-lavaged and differential WBC was estimated in BAL sediment.
Results: Budesonide treatment significantly improved gas exchange and decreased right-to-left pulmonary shunts, central venous pressure, ventilatory pressures, reduced meconium-induced lung edema formation, airway hyperreactivity, neutrophil count in BAL associated with higher WBC and neutrophil counts in the blood, and diminished oxidative modifications of proteins and lipids in lung homogenate compared to non-treated Mec group (all $P<0.05$, 0.01 or 0.001).
Conclusions: Intratracheally administered corticosteroid budesonide effectively improved the lung functions and reduced inflammation and airway hyperreactivity induced by meconium instillation in rabbits.

The study was supported by Grant of Agency for Science and Ministry of Education (VEGA) No. 1/2306/05.