AMINOPHYLLINE TREATMENT ALLEVIATED MECONIUM-INDUCED ACUTE LUNG INJURY IN A RABBIT MODEL

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Introduction: Methylxanthines as non-selective phosphodiesterase inhibitors and antagonists of adenosine receptors may diminish lung edema formation, inflammation, vasoconstriction and bronchoconstriction in meconium aspiration syndrome, and thereby improve the lung functions.
Material and methods: Air-ventilated adult rabbits received intratracheally 4 ml/kg of either saline (Sal group, n=5) or meconium suspension (25 mg/ml). From this moment, all animals were oxygen-ventilated. When respiratory failure developed, meconium-instilled animals received intravenously aminophylline (2 mg/kg) at 0.5 and 2.5 h after meconium instillation (Mec+Amin group, n=7) or were left without treatment (Mec group, n=8). All animals were ventilated for additional 5 h after the first treatment dose. Lung functions, blood gases and white blood cell count (WBC) were evaluated in regular time intervals. Right lungs were used to determine airway reactivity by an *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 levels in the lung homogenate. Left lungs were saline-lavaged and differential WBC was estimated in BAL sediment.
Results: Intravenous aminophylline significantly improved oxygenation, reduced intrapulmonary shunting, central venous pressure and lung edema. In addition, aminophylline diminished meconium-induced airway hyperreactivity, decreased number of neutrophils in BAL associated with higher total WBC and neutrophils in the blood, and prevented oxidative damage to proteins and lipids in lung homogenate compared to non-treated Mec group (all $P<0.05$, 0.01 or 0.001).
Conclusions: Aminophylline enhanced the pulmonary functions, decreased meconium-induced airway hyperreactivity, diminished lung edema and inflammation in a rabbit model of meconium aspiration syndrome.

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