Methylprednisolone does not enhance the surfactant effects on oxygenation and histology in paraquat-induced rat injury

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摘要

Abstract

OBJECTIVE: To investigate whether exogenous surfactant would improve gas exchange and lung histology and methylprednisolone pretreatment would enhance the surfactant effect in a rat model of paraquat-induced lung injury. SETTING: University research facility. SUBJECTS: Thirty-three adult male Sprague-Dawley rats. INTERVENTIONS: All rats received intraperitoneal paraquat injection (35 mg/kg) and were assigned randomly to one of four groups: the control group received no further treatment; the methylprednisolone group received a concomitant intraperitoneal methylprednisolone injection (30 mg/kg); the surfactant group received intratracheal Survanta (100 mg/kg) at the start of ventilation; and the methylprednisolone + surfactant group received both methylprednisolone and surfactant treatments. MEASUREMENTS AND MAIN RESULTS: Three days after paraquat injection, every rat was ventilated for 90 min, a static pressure-volume curve and bronchoalveolar lavage were performed and postmortem histology was examined. Treatment with surfactant and methylprednisolone + surfactant improved oxygenation relative to the control group and produced significantly higher lung volumes than the control and methylprednisolone groups. Treatment with surfactant resulted in a significant decrease in total cell and neutrophil counts relative to the control group. Surfactant with methylprednisolone pretreatment significantly decreased total cell, macrophage and neutrophil counts when compared with the surfactant group. The histological appearance of the lungs was better in the two surfactant-treated groups. CONCLUSION: Intratracheal instillation of surfactant improves gas exchange, ameliorates lung inflammation and results in less lung damage in paraquat-induced rat lung injury. Surfactant with methylprednisolone pretreatment decreases inflammatory cell infiltration, but cannot further improve oxygenation and lung histology.