

The predictive value of FiO₂ for outcome of children with respiratory syncytial virus-induced acute respiratory distress syndrome

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INTRODUCTION Respiratory syncytial virus (RSV) infection can progress to acute respiratory distress syndrome (ARDS) in infants. ARDS is a life threatening condition that is characterized by severe hypoxemia defined as PaO₂/FiO₂ ratio <300 mmHg. Many trials use this ratio as an inclusion criterion. Recently, however, it has been shown in adults with ARDS that FiO₂, independently predicts mortality, suggesting that the PaO₂/FiO₂ ratio alone might be insufficient to identify patients for clinical trials. In this study we determined if FiO₂ predicted the duration of mechanical ventilation (MV) and length of stay (LOS) in the pediatric intensive care unit (PICU) in infants with RSV-induced ARDS.

METHODS A retrospective study was conducted between 1999-2011. Infants with an RSV infection who were admitted to the PICU for MV were screened for ARDS up to 48 hours after admission. Independent predictors for outcome were analyzed using the cox regression model. Endpoints were duration of MV and LOS in the PICU.

RESULTS In total 129 infants were included in the study. In a multivariate analysis a higher initial FiO₂ was independently associated with a longer duration of MV (HR 0.06, CI 0.01-0.48, p = 0.008) and increased LOS in the PICU (HR 0.07, CI 0.01-0.58, p = 0.014). In the univariate analysis PaO₂/FiO₂ ratio did not correlate with outcome.

CONCLUSION Initial FiO₂ level independently predicted outcome in children with RSV-induced ARDS, whereas the PaO₂/FiO₂ did not. Therefore FiO₂ should be taken into account in clinical trials in infants with RSV-induced ARDS.