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Title: High flow nasal cannula therapy improves clinical and gas exchange parameters in children with acute bronchiolitis

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Body: Introduction: Heated and humidified high flow nasal cannula oxygen therapy (HFNC) is increasingly used to treat children with acute viral bronchiolitis. Aim: To determine whether this treatment modality is associated with improvement in physiological parameters in infants and children with acute hypoxemic respiratory failure. Methods: In a prospective observational study data from children younger than 24 months were collected. HFNC was started on worsening clinical state despite conventional management, when no immediate intubation was needed. Clinical respiratory parameters and capillary blood gasses were assessed just prior to and after introduction of HFNC. Results: Data from 39 children (11 girls), median age 11 (range 0,3 – 24) months, with acute viral bronchiolitis were analyzed. Patients' mean SpO_2 on admission was 91% (± 4%). After HFNC a significant decrease in respiratory rate, 51 (± 11) vs. 46 (± 13) breaths per minute (P = 0,007), heart rate, 150 (± 15) vs. 130 (± 17) beats per minute (P = 0,000) and respiratory effort score, 4,6 (± 1,1) vs. 4,0 (± 0,9) (P = 0,0003) was documented. There was a significant increase in SpO_2 96,8 (± 2,7) vs. 98,5 (± 1,6) percent (P = 0,01). Besides, a significant increase in capillary blood pH, 7,36 (± 0,06) vs. 7,40 (± 0,43) (P = 0,0006) and decrease in PCO_2, 5,96 (± 1,02) vs. 5,32 (± 0,83) kPa (P = 0,0004) issued. A trend towards lower capillary blood bicarbonate concentration and blood glucose level was seen. 8 patients secondarily deteriorated and needed intubation, none of them died. Conclusions: HFNC can effectively improve respiratory and gas exchange parameters in critically ill children with acute bronchiolitis.