Methods: Medical records of 266 mechanically ventilated patients admitted to a tertiary level PICU from January 2003 to December 2007 were retrospectively reviewed.
Results: Out of 1075 patients admitted to the PICU during 5 years, aged from 1 month to 14 years (mean age 3.68 years), 266 (24.7%) patients required mechanical ventilation. The main indications for mechanical ventilation were central nervous system diseases (32.3%), followed by respiratory (29.3%), cardiovascular (27.1%), and neuromuscular (9.4%) diseases, and others (2.6%). The mean duration of mechanical ventilation was 10.8 ± 7.1 days. Complications associated with mechanical ventilation developed in 89 patients (33. 4%), and they included atelectasis (12.8%), ventilator-associated pneumonia (10.5%), pnemothorax (5.3%), laryngeal edema (3.0%) and accidental extubation (1.8%). Patients with respiratory diseases had the highest rate of complications (56.2%), while patients with central nervous system disease had the lowest rate (4.5%). Overall mortality rate of mechanically ventilated patients was 34.5%, and there was no significant difference between ventilated patients with and without complications regarding mortality rate (35.1% vs 33.9%).
Conclusion: Central nervous system diseases were the most common indication for mechanical ventilation. Complications associated with mechanical ventilation occurred in 1/3 of ventilated patients, but they did not increase the mortality rate.

NON-INVASIVE VENTILATION OUTCOME PREDICTORS IN CRITICALLY ILL CHILDREN

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Objective: Identification of predictive factors for non-invasive ventilation (NIV) failure in pediatric patients.
Methods: Prospective observational study performed in a Pediatric Intensive Care Unit (PICU) in a University Hospital. Eighty-seven patients who received NIV were included. Clinical data collected were respiratory rate (RR), heart rate (HR) and FiO_2 before NIV began. The same data and inspiratory (IP) and expiratory (EP) pressures were collected at 1, 6, 12, 24 and 48 hours. Conditions precipitating respiratory failure were classified into two groups: type 1 ARF (hypoxemic) – 29 episodes; and type 2 ARF (hypercapnic) – 58 episodes. Factors predicting NIV failure were determined by multivariate analysis.
Results: NIV success rate was 86.2% (72.4% in type 1 and 93.1% in type 2). Type 1 ARF patients showed a higher risk of NIV failure compared to type 2 ARF (OR 16.988; 95% CI 2.895 to 99.669). A lower RR before starting NIV (OR 0.929; 95% CI 0.869 to 0.994), and a lower RR decrease (at 1 hour and at 6 hours; OR 0.907; 95% CI 0.832 to 0.989 and OR 0.895; 95% CI 0.895 to 0.992, respectively) were also independently associated with NIV failure.
Conclusions: NIV has a high success rate in pediatric patients. Type 1 group classification, lower RR before starting NIV, and lower RR decrease during NIV were independent risk factors for NIV failure.

PEDIATRIC NON-INVASIVE VENTILATION: A PROSPECTIVE DESCRIPTIVE STUDY

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Objective: Determination of non-invasive ventilation (NIV) characteristics in pediatric patients.
Methods: Prospective observational study performed in a Pediatric Intensive Care Unit (PICU) in a University Hospital. Eighty-seven patients were included. Clinical and epidemiological data were collected. Conditions precipitating respiratory failure were classified into two groups: type 1 ARF (hypoxemic) – 29 episodes; and type 2 ARF (hypercapnic) – 58 episodes.
Results: Fifty-three patients were males (60.9%). Median age was 9.1 months (0.5–169.1), and median weight was 8.4 kg (2.8–40). Most common admission diagnoses were pneumonia (89.7%) in type 1 ARF and bronchiolitis (41.4%) and asthma (36.3%) in type 2 ARF. Respiratory rate decreased from 53.5 ± 18.3 before NIV began to 36.4 ± 9.1 at 6 hours ($p<0.001$), while heart rate decreased from 163.1 ± 29.7 to 135.6 ± 23.5 ($p<0.001$) and FiO_2 from 0.44 ± 0.24 to 0.39 ± 0.16 ($p = 0.092$). Face masks were used in 61 episodes and nasal masks in 25. NIV median duration was 39 hours (range: 2–375). Sedatives were administered in 63.2% (continuous perfusion in 50.6%), and enteral nutrition was given in 48.2% of the children. Complications secondary to NIV were detected in 21 episodes (24.1%): non-severe skin lesion in 17, pneumothorax in 3, and upper airways bleeding in 1. Four children died, but none of deaths was related to NIV use. NIV success rate was 86.2% (72.4% in type 1 ARF and 93.1% in type 2 ARF).
Conclusions: NIV is a safe and useful respiratory support technique in pediatric patients, even in small toddlers. Sedative use is frequent.

ON-LINE RESPIRATORY MECHANIC MONITORING IN NEWBORNS: REPRODUCIBILITY AND EFFECT OF VENTILATORY MODE

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Objectives: Neonatal ventilator softwares provide information on respiratory mechanics (RM). Integration of those values with clinical variables could improve ventilation management. We investigated accuracy and reproducibility of those variables in Assist Control (AC) and Synchronised Intermittent Mandatory Ventilation (SIMV) modes.
Methods: Data (Ventilation pressures, Tidal Volume (VTe), Minute Ventilation (MV), Compliance (C), Resistance (R)) from a Babylog 8000 ventilator were collected during 9 minutes in 15 infants ventilated in AC. Variability of individual values was compared to that of the 1 and 3 minute(s) mean periods. For each period, C, R and VTe were calculated from one demonstrative respiratory loop reconstructed from continuous recordings. Nine newborns ventilated in SIMV were recorded in SIMV and AC.
Results: In AC, VTe, MV, C, and R variability of individual values represents 12, 12, 13 and 20%, respectively, and improves to 5.5, 7.6, 7, and 10% using one minute average and 3.5, 5.6, 4.7, and 5.8% with three minutes average. Variability in SIMV has a similar pattern. Calculated values from loops are within 20% of ventilator values. SIMV values for mean pressures and VTe are different from AC. Difference is 24% for R and 10% for C (not significant).
Conclusions: In both modes continuous ventilator RM data are difficult to integrate into clinical practice. Averaging those parameters allows for more reproducible values that could be used for trend monitoring. Non-assisted breaths interfere with calculation of RM values. RM assessment of patients on SIMV ventilation should be done with a brief switch to AC.

WHY USE NON-INVASIVE VENTILATION IN INFANTS WITH SPINAL MUSCULAR ATROPHY TYPE 1. REPORT OF TWO CASES

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Introduction: Spinal muscular atrophy (SMA) is an autosomal recessive neuromuscular disorder characterised by degeneration of