

997 VENTILATOR-ASSOCIATED PNEUMONIA (VAP) ON PEDIATRIC INTENSIVE CARE UNIT

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Introduction Ventilator-associated pneumonia (VAP) is a form of nosocomial infections - pneumonia which occurs in patients who are on mechanical ventilation for longer than 48 hours. It is very often complication on intensive unit care.

Aim To evaluate prevalence VAP on Paediatric intensive care unit (PICU) and the most common causes. Subjects and methods: From mart 2009. till mart 2011., 42 patients age two months to eight years. Design of study: prospective Patients were divided according to age, gender, time of manifestations VAP, types of microorganisms isolated in cultures.

Results From 42 investigated patients 22/42 (52.3%) were females. Patients were divided in the groups according to their age as follows: 0–6 months 9/42 (21.4%), 7–12 months 17/42 (40.4%), 1–3 years 11/42 (24.4%), 4–8 years 5/42 (11.9%) patients. According to time of manifestations VAP: between 48–96 hours of ventilations 14/42 (33.3%) patients, after 96 hours of ventilations 14/42 (33.3%) patients. According to types of microorganism isolated in cultures: *Klebsiella pneumoniae* 12/42 (28.5%), *Acinetobacter calcoaceticus* 7/42 (16.6%), *Staphylococcus aureus* 7/42 (16.6%), *Pseudomonas aeruginosa* 4/42 (9.5%), *Enterobacter* 4/42 (9.5%), *Stenotrophomonas maltophilia* 2/42 (4.7%), unknown 8/42 (19.2%). De-escalation therapy was administered in 30/42 (71.4%) patients. Dual antibiotic therapy was found in 22/42 (52.3%) patients. Mortality was 13/42 (30.9%) patients, in group therapy with deescalation 7/13 (53.8%), whereas in the monotherapy group was 8/13 (61.5%) patients.

Conclusion VAP is quite common complication on PICU. Previously taken cultures are very helpful in timely selection antibiotics and successful recovery.

998 NONINVASIVE POSITIVE PRESSURE VENTILATION IN INFANTS AND CHILDREN WITH ACUTE RESPIRATORY FAILURE

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Objective This study was performed to determine faisability and efficacy of Noninvasive positive pressure ventilation (NPPV) for infant and children with acute respiratory failure (ARF).

Materials and Methods During March 2006 to December 2011, we include in this prospective observational study infants and children ≤ 16 years of age hospitalized at the multidisciplinary PICU of the university teaching hospital of Oran with hypoxemic or hypercarbic acute respiratory distress. The patients were eligible to receive in first intention mask ventilation by means of a conventional volumetric ventilators as an alternative means of respiratory support in association with conventional medical treatment. Patients were evaluated regarding physiologic variables prospectively before NIV and at 2 hrs of NPPV.

Results A total of 109 patients were included. The average of age been of 57.07±57.95 months, we use NPPV for 22 (20%) children with hypercarbic acute respiratory failure (ARF), for 87 (80%) with hypoxemic ARF. 44 (40%) patients had ARF after extubation. The

BiPAP mode was used among all patients. After the second hour of NPPV we observe reduction of respiratory rate (43.72±13.46 b/min vs 34.25±13.47, p<0.01), heart rate (138.66 b/min vs 129.27±24.21, p<0.01) and improvement of the SPO₂ (86.17±13.33 vs 94.85±6.9, p<0.01). We listed only 36 (33%) failures which had recourse to the intubation.

Conclusion The NPPV is an interesting technique in PICU and the results are promising. The post-extubation ARF is probably a better indication for NPPV in paediatrics.

999 VALIDATION OF PEDIATRIC CARDIORESPIRATORY SIMULATOR: SIMULRESP

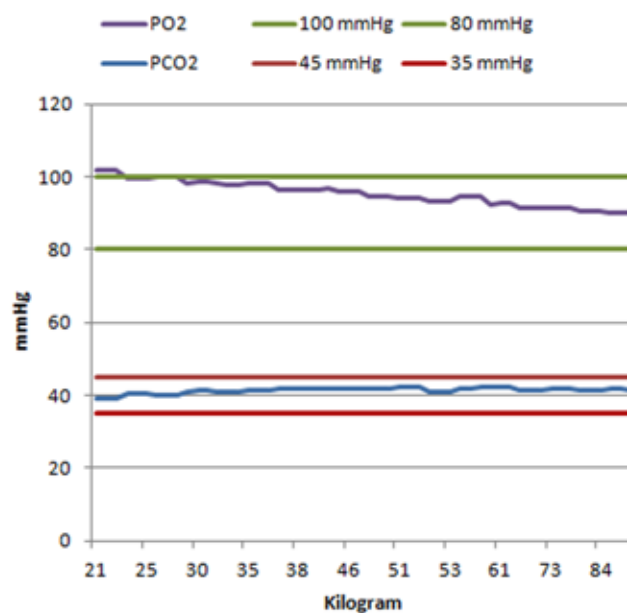
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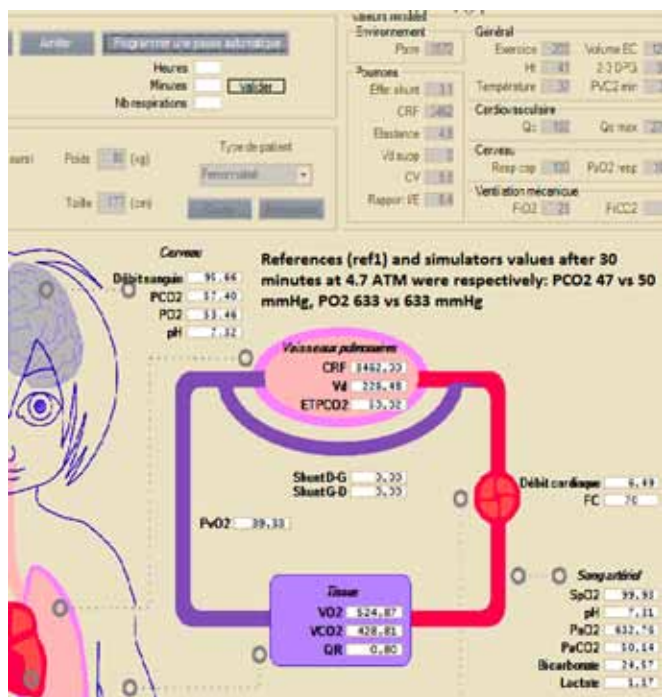
Introduction To improve the training of medical students in respiratory physiology, we created an interactive cardio-respiratory simulator (SimulResp, figure 1). The objective of our study was to validate the simulator in normal and specific patient conditions.

Methods We run SimulResp (version 2012.03.10.01) with several virtual patients characteristics: sex (M/F), age (8 to 18 years old) and weights (10th, median, 90th percentiles), atmospheric pressure increase (simulation of scuba diving condition). SimulResp was run 3 times for each patient characteristic. We compared pH, PO₂ and PCO₂ obtained from the simulations to physiological values published in literature.

Results Blood gases values obtained from SimulResp (figure 1) were within normal range (pH 7.35–7.45, PCO₂ 35–45 mmHg, PO₂ 80–100 mmHg). At 4.7 atmospheres, the difference with the published data (ref 1) was less than 10% for all values (figure 2).



Abstract 999 Figure 1 Physiological condition at H4



Abstract 999 Figure 2 Ventilation simulation at 4.7 ATM

Conclusion The cardiorespiratory simulator, SimulResp, delivered blood gases values within normal range. The next step will be to implement clinical scenarios to facilitate medical student training.

Reference (1) Cherry AD, Predictors of hypercapnia in immersed exercise at depth, JAP2008,106:316–325.

1000 REPEATED THERMO-STERILIZATION INFLUENCES THE RELIABILITY OF PEEP-VALVES

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Introduction PEEP valves are used to provide a preset positive end-expiratory pressure (PEEP) together with self-inflating bags (SIB). It has recently been shown that such valves may deliver unreliable PEEP. We hypothesized that material fatigue due to repeated thermo-sterilization was responsible for decreasing reliability of PEEP valves.

Methods Laboratory study of 10 factory new PEEP valves. Valves were tested before (measurement 1) and after 10, 20 and 30 (measurements 2, 3, 4) cycles of routine thermo-sterilization for 7 min at 134°C by using a neonatal lung model (compliance 0.2ml*kPa⁻¹). Settings were: peak inspiratory pressure (PIP)=20 and 40cm H₂O, PEEP=5 and 10cm H₂O, respiratory rate=40 and 60/min, flow=8l/min. PEEP was recorded using a respiratory function monitor.

Results Before thermo-sterilization, a mean (SD) PEEP of 4.0 (0.9) and 7.7 (1.0)cm H₂O was delivered by the 10 valves when set to 5 and 10cmH₂O, respectively. One new valve only delivered 2.0 (0.0) and 5.0 (0.0)cm H₂O. Four of the 10 investigated valves showed relevant variations in PEEP (CV>10%) throughout the thermo-sterilization process. Valve No. 8 completely lost its function after the second cycle of thermo-sterilization. 6/10 valves maintained the

ability to provide PEEP despite repeated autoclavation. Some valves showed tears or displacement of the rubber seal.

Conclusion The reliability of PEEP valves is affected by repeated thermo-sterilization. Valves should be tested before each use and substituted if necessary.

1001 CAN CLINICIANS PREDICT EARLY WHICH BABIES WOULD GO HOME ON OXYGEN: A CASE CONTROL STUDY

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Background Babies born at extreme gestation are prone to develop complications of prematurity including bronchopulmonary dysplasia (BPD). It is however very difficult to predict babies at risk of being discharged on home oxygen.

Aims To identify the possible contributing factors for chronic oxygen dependency among infants born before 28 weeks gestation.

Methods Babies born before 28 weeks gestation between 2009 and 2011 and discharged home on oxygen (cases) from University Hospital of North Tees were identified. Matched control for gestation as close to the date of birth for each case was then identified from admission register. Demographic and clinical details pre & post discharge were collected for cases & controls and analysis for comparison done using SPSS® version 19.

Results

- The mean gestation 26.5vs.25.6 weeks (p=0.170) and birth weight 915vs.828g (p=0.337) were similar between controls & cases respectively.
- Babies discharged on home oxygen were dependent on oxygen for significantly longer period (62vs.31 days; p=0.007); received prolonged CPAP (25vs.12 days; p=0.01) but difference in duration of mechanical ventilation was not significant (25vs.13 days; p=0.11).
- Peak inspiratory pressures for cases were significantly higher compared to controls (30vs.19mm Hg; p=0.031) but length of hospital stay was not different (87vs.80 days; p=0.477).
- BPD rates (p=0.001) and diuretic use (p=0.029) in home oxygen group was significantly higher.
- The duration of home oxygen therapy was not affected by postnatal complications or respiratory support.

Conclusion Prolonged period of respiratory support, high peak inspiratory pressures and use of diuretics in extreme premature babies is correlated with discharge on home oxygen.

1002 MONITORING AND PREVENTION OF UNPLANNED EXTUBATIONS

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Background and Aims Unplanned Extubations (UE's) are potentially life threatening events¹. They can result in traumatic reintubations which in turn can lead to tracheal damage. The monitoring and prevention of these incidents is of paramount importance to the safety of children in the paediatric intensive care unit (PICU).

Methods A previous audit of UE's had been conducted between August 2010 and April 2011 as we had noticed a sharp increase in incidence. Although the rate of 0.56/100 ventilator days was within