

1355

MEASUREMENT OF CHEST WALL VOLUME CHANGES BY OPTOELECTRONIC PLETHYSMOGRAPHY IN NEWBORNS DURING CPAP

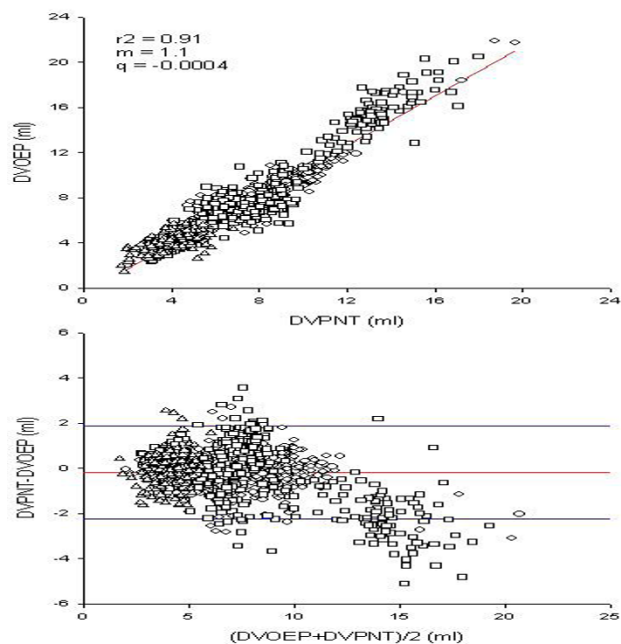
E. Zannin¹, M. Natile², R.L. Dellaca¹,
M.L. Ventura², C. Veneroni¹, M. Colombo²,
 T. Fedeli², A. Pedotti¹, P. Tagliabue²

¹Politecnico di Milano, Milan, ²Department of Neonatology, S. Gerardo Hospital, Monza, Italy

Background and aim: Optoelectronic plethysmography (OEP) allows the measurement of lung volume changes through the assessment of chest wall surface motion. It has been shown that it provides an accurate estimation of total and compartmental (rib cage and abdomen) lung volume changes in adults during spontaneous breathing and mechanical ventilation and in spontaneously breathing infants (REF). The aim of the present study is to evaluate the accuracy of OEP in infants during continuous positive airways pressure (CPAP).

Methods: 5 infants (GA=27.9±3.6, PNA=3.8±3.6, BW=1077±461) were studied for ~ 2 minutes at CPAP 0, 4 and 8 cmH₂O. Flow was measured at the inlet of a full-face mask by a mesh-type pneumotacograph connected to a differential pressure transducer. Chest wall volume changes were measured by OEP (DVOEP) and compared with lung volume changes obtained by integrating the flow signal (DVPNT).

Results: We analysed a total of 602 breaths at 0 cmH₂O, 523 at 4 cmH₂O, and 150 at 8 cmH₂O. The mean difference between DVOEP and DVPNT for all newborns was -0.45±3.92% of V_t at 0 cm H₂O, -4.25±9.04% at 4 cmH₂O and -8.31±3.87% at 8 cmH₂O. Pooling data points from all infants and all pressure levels, Bland-Altman and linear regression analysis showed good agreement between the two measurement techniques (see Fig).



[Figure 1]

Conclusions: OEP can be used to assess lung volume changes and breathing pattern non-invasively in newborns supported by CPAP.

1356

EXTUBATION FAILURE IN VERY LOW BIRTH WEIGHT PRETERM: INCIDENCE AND RISK FACTORS

A. Khaldi, B. Asma, J. Borhene, A. Hamdi,
 B. Sarra, B. Aida, K. Menif, N. Ben Jaballah

Children's Hospital of Tunis, Tunis, Tunisia

A high rate (10-50%) of preterm infant, intubated shortly after birth need reintubation with associated complications (longer mechanical ventilation, hospital stay, higher mortality rate).

Objectives: identify incidence and risk factors associated with failure of extubation in very low birth weight (VLBW).

Population and methods: Retrospective study including 118 preterm infants with VLBW ≤1500 grs requiring mechanical ventilation (MV) within the first 24 hours of life. Extubation failure was defined as the need for reintubation within 7 days after the first Extubation attempt.

Results: 7 patients died before the first Extubation attempt. Of the remaining 111 patients, 19 (17%) failed extubation. Global mortality rate was 18,6% and was higher in the failure group than in the

Successful group (47% vs 13%, p: 0,02). Comparing the two groups (Failure vs Success) with a stepwise linear regression, there was a statistically significant difference regarding birth weight (950 ± 250 grs vs 1370 ± 220 grs, ORaj: 4,5), gestational age (27 ± 1 weeks vs $29,5 \pm 3$ weeks, ORaj:6,1) and severe respiratory distress syndrome (53% vs 22%,ORaj: 3,1). Failure of the first Extubation attempt was associated with longer duration of mechanical ventilation and length of hospital stay (p:0,01).

Conclusion: Incidence of Extubation failure in our very low birth weight preterm population (17%) is similar to the litterature reported rate. Main risk factors include: prematurity, very low birth weight and severe respiratory distress at admission. Implementation of Extubation strategies based on this risk factors can reduce the amount of extubation failure.

1357

BIPAP VISION FOR NIV IN CHILDREN UNDER 30 KG. REPORT OF EFFECTIVENESS AND SAFETY

M. Pons, E. Esteban, J. Ortiz, S. Segura, A. Palomeque

PICU, Hospital Sant Joan de Déu, Esplugues de Llobregat, Spain

Background and aims: To analyze effectiveness and safety of BiPAP Vision device for NIV in children under 30 kilograms with acute respiratory failure.

Methods: Retrospective cohort study with consecutive sampling of patients treated with BiPAP Vision for ARF admitted to PICU between 2008-2009. Patients younger than 3 months, patients with previous intubation during admission or those with palliative indication for NIV were excluded. Patient's demographic data, underlying disease, physiologic data (including Hemoglobin saturation / FiO₂ ratio (SF)) previous, at start point of NIV, and at 2, 8 and 12 hours were collected. NIV failure, defined as need for intubation, was the primary outcome. Descriptive, Uni- and Multivariate statistic analysis was performed.

Results: The sample consists of 194 patients. 112 were male (57,7%). Median age was 2.27 (range 0.25 - 18) years. 103 patients weighted less than 30 kg. NIV failure occurs in 56 patients (23.93%; 95%CI = 13.25- 32.53%). Duration of NIV treatment ranged 0 - 320 (median 38.5) hours. Median PICU length of stay (LOS) was 7,2 (range 1- 45) days. No

statistical difference was observed in NIV's failure in patients weighting under 30 kg (< 30Kg 20%, >30 kg 32.6%) p=0.112 . No complications were observed **Conclusion:** BiPAP Vision is a safe and an effective device to provide NIV in ARF in children under 30 kg.

1358

RESOLUTION OF PNEUMOTHORAX USING INSPIRED FRACTION OF 100% OXYGEN

N.M. Gianini, F.C. Barros, A.P. Miranda, L. Bandeira, T.F. Guerreiro, S. Trindade, S. Dbral, I. Araguez, G. Monteiro

CETRIN - NICU, Casa de Saúde Santa Lúcia, Rio de Janeiro, Brazil

Introduction: Air leaks, especially pneumothorax, are not rare events in NICU. The chest drain is one of the most painful procedures among the many that are performed on newborns. The breathing of 100% oxygen causes the capillary pressure becomes too low hastening the absorption of the pneumothorax.

Objectives: To describe the cases of pneumothorax in NICU and its evolution with the strategy of a hundred percent oxygen therapy.

Method: A descriptive study of cases of pneumothorax during the period of 36 months, using the database,software Epi-info, version 3.2, the CDC - made the measurements of frequency, average and standard deviation.

Results: In 36-month period, 827 hospitalized children. Of these, 17 had pneumothorax during their hospitalization - 2%. The average weight was 2.418 g and gestational age was 35 weeks. The base lung disease was hyaline membrane disease in 6, transient tachypnea of the newborn in 7, pneumonia in 2 and meconium aspiration syndrome in 2. Of the 17 newborns in the study 53% of newborns did not require chest tube drainage.

Discussion: The concern for invasive and painful procedures has increased in recent years in neonatal units. The drainage and retention of the drain are painful. Pneumothorax that few symptoms, can be treated and solved with oxygen supply of 100%, since there is monitoring of color, respiratory rate and heart rate. Our sample shows the effectiveness of this strategy and security in its broad implementation.