

European Respiratory Society Annual Congress 2013

Abstract Number: 521

Publication Number: P3848

Abstract Group: 2.2. Noninvasive Ventilatory Support

Keyword 1: Neonates **Keyword 2:** Ventilation/NIV **Keyword 3:** Surgery

Title: Noninvasive ventilation and alveolar recruitment maneuver improve respiratory function during induction of anesthesia of newborn with bowel atresia

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Body: Background: The aim of this prospective study was to determine whether noninvasive positive pressure ventilation (NPPV) improves arterial oxygenation and end-expiratory lung volume (EELV) compared with conventional preoxygenation, and whether NPPV followed by early recruitment maneuver (RM) after endotracheal intubation (ETI) further improves oxygenation and respiratory function compared with NPPV alone. Methods: 28 patients were randomized to receive 5 min of either conventional preoxygenation with spontaneous breathing of 100% O₂ (CON), NPPV, or NPPV followed by RM (NPPV+RM). Gas exchange was measured in awake patients, at the end of preoxygenation, after ETI, and 5 min after the onset of mechanical ventilation (MV). EELV was measured after ETI and 5 min after MV. The primary endpoint was arterial oxygenation 5 min after the onset of MV. Results are presented as mean±SD. Results: At the end of preoxygenation, Pao₂ was higher in the NPPV and NPPV+RM groups (376±72 mmHg and 369±80 mmHg, P<0.001) compared with the CON group (295±56 mmHg) and remained higher after ETI (232 ±92 mmHg and 218±104 mmHg, in the NPPV and NPPV+RM groups, P<0.01 compared with the CON group [146±52 mmHg]). After ETI, EELV was higher in the NPPV group compared with the CON group (P<0.001). Compared with NPPV alone, RM improved gas exchange and EELV (P<0.05). A significant correlation was found between Pao₂ obtained 5 min after MV and EELV (R=0.41, P<0.001). Conclusion: NPPV improves oxygenation and EELV in newborn compared with conventional preoxygenation. NPPV combined with early RM is more effective than NPPV at improving respiratory function after ETI.