

# European Respiratory Society Annual Congress 2012

**Abstract Number:** 4333

**Publication Number:** P4639

**Abstract Group:** 2.1. Acute Critical Care

**Keyword 1:** ARDS (Acute Respiratory Distress Syndrome) **Keyword 2:** ALI (Acute Lung Injury) **Keyword 3:** Children

**Title:** Study of cardiac and hemodynamic changes with airway pressure release ventilation and pressure control ventilation in children with acute respiratory distress syndrome

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**Body:** Background: Acute respiratory distress syndrome (ARDS) is associated with high morbidity and mortality. Airway pressure release ventilation (APRV) was suggested to be a suitable mode for ventilating such patients with less liability of lung injury. Aim: to compare the effect of APRV and pressure control ventilation (PCV) on cardiac and hemodynamic functions in children with ARDS. Patients and Methods: Twenty children aged 1-14 years fulfilling ARDS criteria were included. The following parameters were recorded after ventilating the patients on PCV and APRV: ventilation parameters [peak inspiratory pressure (PIP) and mean airway pressure (MAP)], oxygenation parameters  $\text{PaO}_2/\text{FiO}_2$  ratio and oxygen delivery, hemodynamic parameters and urine output. Results: PIP significantly decreased from  $29 \pm 7$  with PCV to  $24 \pm 4$   $\text{cmH}_2\text{O}$  with APRV, while MAP was significantly higher during APRV ( $17 \pm 5$ ) than during PCV ( $13 \pm 3$ )  $\text{cmH}_2\text{O}$ .  $\text{PaO}_2/\text{FiO}_2$  ratio increased significantly from  $265 \pm 25$  during PCV to  $295 \pm 33$  during APRV. Oxygen delivery increased significantly from  $865 \pm 98$  during PCV to  $1196 \pm 127$   $\text{ml}/\text{min}$  during APRV. Cardiac index increased significantly from  $3.2 \pm 0.2$  during PCV to  $4.1 \pm 0.3$   $\text{l}/\text{min}/\text{m}^2$  during APRV. Urine output increased significantly from  $0.78 \pm 0.1$  during PCV to  $0.97 \pm 0.2$   $\text{ml}/\text{kg}/\text{h}$  during APRV. The use of sedatives and inotropics were decreased significantly during APRV compared to PCV. Conclusions: APRV may be a suitable mode for ventilating ARDS patients providing better lung recruitment and oxygenation, avoiding more lung injury and cardiac compromise compared with pressure control ventilation.