INTRODUCTION

Rational Background

Respiratory distress syndrome (RDS) is the most common cause of respiratory failure and requirement for mechanical ventilation (MV) of newborns. In developing countries, despite facilities for respiratory care of newborn infants, RDS mortality rate and percentage of complications still remain high in comparison to the developed countries. Survival rates of RDS infants requiring MV ranged from 25% in those newborns with birth weight <1000 grams up to 53% in those with birth weight >2500 grams. ***(Marraro, 2004)***

Mechanical ventilation is the most widely used supportive technique in intensive care units ***(Greenough, et al., 2004).*** Several forms of external support for respiration have long been described to assist the failing ventilatory pump, and access to lower airways through tracheostomy or endotracheal tubes had constituted a major advance in the management of patients with respiratory distress. More recently, however, new "noninvasive" ventilation (NIV) techniques, using patient/ventilator interfaces in the form of facial masks, have been designed ***(Brochard, 2003).***

Recurrent apnea is common in preterm infants, particularly at very early gestational ages. These episodes of loss of effective breathing can lead to hypoxemia and bradycardia which may be severe enough to require resuscitation including use of positive pressure ventilation.***(Davis, et al.2005).*** Theophylline and continuous positive airways pressure (CPAP) are two treatments that have been used to prevent apnea and its consequences ***(Henderson, et al., 2005).***

Mechanical ventilation using positive pressure can need airway invasion using an endotracheal tube or, as is being more frequently seen, non-invasion of airways can be performed (use of facial and nasal masks). Spontaneous breathing can be supported (CPAP, Pressure or Volume Support Ventilation) or ventilation can be totally or partially controlled (Volume and Pressure Controlled Ventilation, Synchronized Intermittent Mandatory Ventilation). ***(Mehta & Arnold, 2004).***

The early application of nasal continuous positive airway pressure (nCPAP) reduces the need for subsequent endotracheal intubation, mechanical ventilation, and surfactant therapy (***Merran.et al., 2004) & (***Subramaniam***, el al., 2005).***

CPAP maintains inspiratory and expiratory pressures above ambient pressure, which should result in an increase in functional residual capacity (FRC) and improvement in static lung compliance and decreased airway resistance in the infant with unstable lung mechanics***.(Sandri,et al.,2004)***. This allows a greater volume change per unit of pressure change (i.e., greater tidal volume for a given pressure change) with subsequent reduction in the work of breathing and stabilization of minute ventilation. ***(Steer, et al, 2005).*** CPAP increases mean airway pressure, and the associated increase in FRC should improve ventilation-perfusion relationships and potentially reduce oxygen requirements. Additionally CPAP may expand, or stent, upper airway structures preventing collapse and upper airway obstruction ***(A.A.R.C., 2004.)***