Introduction

Noninvasive ventilation includes various techniques of augmenting alveolar ventilation without an endotracheal airway. Noninvasive methods include external negative pressure, chest wall oscillation, rocking beds, and positive pressure ventilation (NIPPV)[48]

The recent introduction of NIPPV and its successful and widespread use in the management of chronic ventilatory failure has resulted in its application in selected patients with acute respiratory failure. NIPPV has now become a treatment option for some patients who would otherwise be managed by intubation, or perhaps would not have received mechanical ventilation at all.

The advantages of NIPPV include improved patient comfort, reduced need for sedation, and avoidance of the complications of endotracheal intubation, including upper airway trauma, sinusitis, otitis and nosocomial pneumonia. Furthermore, airway defense mechanisms, and speech and swallowing are left intact and the patient remains alert and communicative[193] NIPPV has been used successfully to treat acute respiratory failure in postoperative patients, and in those with pulmonary edema, COPD, and obstructive sleep apnea. NIPPV has also been used to facilitate weaning. However, NIPPV appears to be particularly effective in patients with an exacerbation of COPD, who are alert and cooperative.

Uncontrolled trials in COPD patients with acute respiratory failure have found NIPPV to be effective and safe as an early intervention to prevent deterioration to the point of requiring

endotracheal intubation or as an alternative to endotracheal intubation in patients with severe impairment in gas exchange.[28] The results of other randomized studies provide conclusive evidence that adding NIPPV to standard therapy in eligible patients with COPD and acute exacerbation decreases the need for endotracheal intubation and improves outcome. NIPPV can be a safe and effective means of augmenting ventilation to many COPD patients with acute respiratory failure if physicians and hospital respiratory technicians develop familiarity with this method. Although most of patients improve with NIPPV , the response to treatment and duration of mechanical ventilation frequently can not be predicted by severity of the underlying lung disease.[145]

The most common complication with the use of NIPPV is facial trauma. The problem of skin necrosis, particularly over the bridge of the nose, makes it difficult for patients to be ventilated continuously for more than one to two days. Retention of secretions and gastric distension may be problematic in some patients. [48, 193]

Several interfaces and ventilator modes have been used to deliver NIPPV to patients with acute respiratory failure, including facial masks covering both the nose and mouth and nasal masks. NIPPV can be delivered using a conventional ventilator using volume- or pressure limited ventilation or specialized noninvasive ventilators.[289]