Title: NIPPV Management on a Step-down Intensive Care Unit

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Introduction: Until about 10 years ago, all forms of ventilation were initially exclusively managed on intensive care units. With the increase in co-morbidities and aging of the general population, non-invasive positive pressure ventilation (NIPPV) is now commonly managed by non-critical care or respirology physicians. Evidence has shown the feasibility of NIPPV management on a medical ward with careful patient selection, staff education and collaboration with intensive care or respirology.[1]

Objective: The objective of this project was to evaluate the safety and effectiveness of management of NIPPV by non-critical care or respirology services.

Methods: A prospective chart review of incident NIPPV patients admitted to a step-down ICU was conducted over 6 weeks with a 30-day follow-up period. Data was collected about acid-base disturbances, medical management, indications and contraindications for NIPPV, ventilator management, and adverse events.

Results: 36 patients were reviewed; the indication for NIPPV was work of breathing in 12 patients, type 2 respiratory failure in 20 patients, and hypoxia in 4 patients The admitting service for 33 patients was internal medicine; 1 patient was under thoracic surgery, 1 under neurology and 1 under cardiac surgery. Respiratory therapists managed ventilator settings for all patients, with respirology co-managing for 3 patients. 29 patients had a respiratory acidosis; with a pH <7.25 in 23 patients. ICU was consulted for 7 patients, and respirology was consulted for 10. 26 patients had ≧1 relative contraindications for NIPPV; 14 patients were agitated or unable to cooperate with NIPPV, 8 patients were experiencing cardiac ischemia or arrhythmia, 6 patients were hemodynamically stable and requiring vasopressor support, 5 patients had an impaired cough and/or swallow, 1 patient had an upper GI bleed and 1 patient had a pneumothorax. The average time to weaning of NIPPV was 3 days; 5 patients could not be weaned off and required chronic NIPPV, and 3 were transitioned to symptom directed management. 15 patients experienced adverse events secondary to NIPPV: 10 patients reported dry nose/throat or pooled secretions blocking their nasal passage; 16 patients reported impaired sleep due to being on NIPPV; 2 patients developed nasal lesions; 1 patient developed conjunctivitis; 1 patient was hyperventilated and developed an abrupt CO2 drop. Mobility worsened in 15 patients, although physiotherapy was consulted in 24 out of 36 patients; 21 patients had their feeding delayed due to being on NIPPV.

Conclusion: NIPPV managed by non-critical care services may have inconsistent management of acid-base disturbances and consultation with critical care or respirology. Patients with relative contraindications, in particular, may require multidisciplinary management of NIPPV on a non-critical care service.

References:

1. La Regina et al. Non-invasive mechanical ventilation in Internal Medicine Departments: A Pilot Study. Italian Journal of Medicine 2013; 7