

## Is there a role for home NIV in COPD patients?

Dr. Chung-ming CHU

Department of Medicine & Geriatrics, United Christian Hospital, Hong Kong



Dr. Chung-ming CHU

Acute application of NIV has been shown by multiple RCTs and meta-analysis to improve arterial blood gases, reduce length of hospital stay, reduce ICU stay, intubation and mortality in patients suffering from acute hypercapnic respiratory failure (AHcRF) due to COPD<sup>1</sup>. However, there is no evidence to suggest that acute NIV alters the natural course of the disease after discharge. In a prospective study of COPD patients who survived an episode of AHcRF due to COPD after treatment by acute NIV, there were high rates of readmission and life-threatening events in the ensuing year<sup>2</sup>. These outcomes were much worse if the patients declined intubation<sup>3</sup>.

Few available therapies are proven to improve these adverse outcomes. Long-term oxygen therapy is the only treatment documented to prolong survival in COPD in RCTs. There has been uncontrolled data to suggest that home NIV might reduce costs, hospital admissions, ICU days and clinic visits in severe COPD with hypercapnic respiratory failure, and it is an accepted practice to prescribe domiciliary NIV for COPD patients who experience recurrent AHcRF<sup>4</sup>. However, results from RCTs are conflicting and mortality was not shown to be improved in these RCTs. Despite the lack of data from RCTs, almost half of the home NIV users in Hong Kong are COPD patients, and the number is growing tremendously at a cubic function of time<sup>5</sup>.

Based on consensus opinions from experts, the following indications are considered acceptable to commence home NIV in patients with severe COPD: (1) presence of relevant symptoms (e.g., fatigue, headache, morning headache, etc.), and (2)  $\text{PaCO}_2 \geq 55$  mmHg or  $\text{PaCO}_2 50 - 54$  mmHg and nocturnal  $\text{SaO}_2 \leq 88\%$  for 5 consecutive minutes while receiving  $\text{LTOT} \geq 2$ LPM or has episodes of recurrent AHcRF ( $\geq 2$  per year)<sup>2</sup>. The promising interim results of a prospective RCT comparing the continuation of home NIV vs. sham ventilation in COPD patients who survived AHcRF after acute NIV will be discussed<sup>6</sup>.

### References:

1. Lightowler JV, Wedzicha JA, Elliot MW, et al. Non-invasive positive pressure ventilation to treat respiratory failure resulting from exacerbations of chronic obstructive pulmonary disease: Cochrane systematic review and meta-analysis. *BMJ* 2003;326:185.
2. Chu CM, Chan VL, Lin Awn, Wong IWY, Leung WS, Lai CKW. Readmission rates and life-threatening events in COPD survivors treated with non-invasive ventilation for acute hypercapnic respiratory failure. *Thorax* 2004;59:1020-25.
3. Chu CM, Chan VL, Wong IWY, et al. Non-invasive ventilation in patients with acute hypercapnic exacerbation of chronic obstructive pulmonary disease who refused endotracheal intubation. *Crit Care Med* 2004;32:372-7.
4. Anonymous. Clinical indications for non-invasive positive pressure ventilation in chronic respiratory failure due to restrictive lung disease, COPD, and nocturnal hypoventilation — a consensus conference report. *Chest* 1999;116:521-34.
5. Chu CM, Yu WC, Tam CM, et al. Home mechanical ventilation in Hong Kong. *Eur Respir J* 2004;23:136-41.
6. Chu CM, Cheung AP, Chan VL, et al. A randomized trial of home non-invasive ventilation vs. sham ventilation in survivors of acute hypercapnic respiratory failure in COPD. *Am J Respir Crit Care Med* 2008;177:A767.