HIGH-FLOW HUMIDIFIED THERAPY FOR COPD AT HOME

Home non-invasive ventilation (NIV) improves outcomes in patients with COPD and chronic hypercapnia; however, it is not always well tolerated. High-flow humidified therapy (HFH) offers an alternative more acceptable long-term therapy in these patients. Pisani and colleagues (*BMC Pulmonary Medicine* 2020;20:12) report on the acceptability of HFH to patients and its effectiveness on PaCO₂ reduction. In a pilot study, 50 patients recovering from an acute exacerbation of COPD requiring hospital admission, with persistent hypercapnia but normalised pH on three occasions, were enrolled and started on HFH. An a priori analysis of patients with and without COPD–OSA (obstructive sleep apnoea) overlap was planned. For a 72-hour period, each participant used HFH overnight, plus >8 hours during daytime. Each morning, arterial blood gas result, number of hours of HFH and patient-reported tolerance to therapy (scored 1–5; very bad–very good) were recorded. The therapy was tolerated well by all but one participant (mean patient score 4.0±0.9). Results showed no significant difference in PaCO₂ from baseline overall; however, in patients with COPD without OSA (n=38), PaCO₂ was reduced by ~6 mm Hg (0.8 kPa); p=0.044 at 72 hours. With a lack of control group, it is possible that the improvement in PaCO₂ may represent continued recovery following the acute exacerbation. The study indicates that while HFH may offer an alternative to NIV, the optimum patient group needs to be carefully elucidated and stratified for in future trials.

AUTO-TITRATING NIV IN OBESITY-RELATED RESPIRATORY FAILURE

NIV is most commonly delivered with fixed inspiratory and expiratory pressure (IPAP and EPAP, respectively). The pressures required in the different stages of sleep can vary and ventilators have been developed to automatically adjust both IPAP and EPAP to achieve pre-set tidal volumes and maintain upper airway patency. To compare the effects of

‘auto-NIV’ and fixed-NIV in patients with obesity hypoventilation syndrome (OHS), Patout *et al* (*Respirology* 2020;doi:10.1111/resp.13784) conducted a prospective, single-blind, multicentre randomised controlled trial. Patients with stable OHS were randomised to receive auto-NIV (n=30) or fixed-NIV (n=26), with the primary outcome of sleep quality assessed objectively by polysomnography. Both groups were established on NIV as inpatients, then discharged and followed up at 2 months. Results showed no significant difference between the groups in the primary outcome of sleep quality. Both groups showed an improvement in sleep architecture, with increases in REM and N3 sleep and decreases in N1 sleep and decreased arousals. There was also no significant difference between groups in any secondary outcome: PaCO₂ (reduction of 0.9 kPa in both groups), oxygenation (improvement ~1 kPa in both groups), bicarbonate (reduction of ~2 mmol/L in both groups), hours used (6.2 hours/night in both groups), quality of life (improvement in both groups) or 6 min walk test (no improvement in either group). Set-up was 1 day shorter in the auto-NIV group (3 vs 4 days; p=0.001). While auto-NIV did not out-perform fixed-NIV, it did facilitate a quicker titration of NIV and could support moves to outpatient NIV set-up.

LONG-TERM VENTILATION IN CHILDREN

Long-term ventilation (LTV) is widely used in paediatrics for a range of conditions. There has been a progressive move towards non-invasive (NIV) rather than invasive (IMV) ventilation. In this retrospective, single-centre study, Pavone *et al* (*Italian Journal of Pediatrics* 2020;46:12) sought to identify the characteristics of children on LTV. LTV was defined as IMV or NIV, used for at least 6 hours every day for at least 3 months. They identified a cohort of 432 paediatric patients (IMV=117, NIV=315). Numbers of patients initiated on LTV annually increased from <5 in 2000 to >60 in 2017. The most common indications for LTV were neuromuscular (31%), upper respiratory (25%) and central nervous system disorders (23%). Age at initiation was younger in the IMV group compared with the NIV group (2.1 vs 6.4 years, p=0.0001). There was a similar mortality in the IMV and NIV groups (14.5% vs 14.3%, p=0.95). Patients with more healthcare needs

(p<0.0001) or longer duration of daily ventilation (p=0.0114) had higher mortality. With increasing use of NIV in the paediatric LTV population, it is reassuring that the authors did not report any worse outcomes in this patient group.

HOME NIV IN COPD: EVIDENCE OF BENEFIT IN META-ANALYSIS

The use of NIV in hospital for acute exacerbations of COPD is well established and has been shown to decrease mortality and improve outcomes. Home NIV is increasingly being used for patients with chronic hypercapnic COPD; however, data regarding clinical outcomes are equivocal. Wilson and colleagues (*JAMA* 2020;323:455) conducted a systematic review and meta-analysis of 21 randomised clinical trials and 12 comparative observational studies between 1995 and 2019. Studies were included if they reported results of patients with COPD using NIV at home for >1 month. The US health system classifies NIV as either BPAP (simple device with pressure support mode) or HMV (life support device with additional modes including pressure control). Analysis of BPAP versus no device (21 studies) demonstrated a significant reduction in mortality (OR 0.66; 95% CI 0.51 to 0.87; p=0.003), intubation (OR 0.34; 95% CI 0.14 to 0.83; p=0.02) and fewer all-cause hospital admissions (OR 0.22; 95% CI 0.11 to 0.43; p<0.001), but there was no impact on quality of life. Comparison of HMV versus no device (two studies) showed a reduction in hospital admissions (rate ratio 0.50; 95% CI 0.35 to 0.71; p<0.001), but no difference in mortality. When combined, NIV overall versus no device showed similar results to BPAP versus no device, suggesting home NIV can improve clinical outcomes in these patients. However, the authors note that the strength of the evidence available was low to moderate, and statistical significance was not achieved if only including randomised clinical trials.

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