Reviewer’s report

Title: Noninvasive mechanical ventilation with average volume assured pressure support (AVAPS) in patients with chronic obstructive pulmonary disease and hypercapnic encephalopathy

Version: 3 Date: 13 November 2012

Reviewer: Patrick Murphy

Reviewer’s report:

Major Compulsory Revisions

METHODS

‘Noninvasive Mechanical Ventilation: BiPAP S/T with AVAPS’

How was the maximum IPAP (18-26) decided? Also it needs to be clear to what this refers. The maximum set IPAP on the device or the maximum delivered IPAP received by the patient during therapy. This is a critical point and needs to be unambiguous as it alters the data interpretation. There appears to be different methods for calculating the Vte. Was it set at 9-12ml/kg or was the complex formula used. If the later why was this chosen? There appears to be two ramps set, both seem to relate to the rise time rather than the ramp. This section requires rewriting for clarification. Were leaks, IPAP, Vte recorded from the ventilator software or by other means?

‘Control Group Ventilation Parameters: BiPAP S/T’

See comments above regarding ramp setting.

DISCUSSION

In the reviewers opinion the data does not advocate the use of AVAPS as a first choice ventilatory mode for hypercapnic coma secondary to exacerbations of COPD but reiterates the importance of aggressive titration of the inspiratory pressures to ensure adequate correction of alveolar hypoventilation. Although there is a superior recovery in GCS in the AVAPS group this can be accounted for by the more efficacious high inspiratory pressure provided. The use of such low pressures in the control arm that would be lower than used in routine clinical practice in the UK or that are recommended for therapy in this patient group.1,2 The discussion should be redrafted to reflect the this and the conclusion should be more tempered to reflect the data which shows safety of AVAPS mode when used for acute hypercapnic coma in COPD but cannot be used to recommend it as first line therapy even in experienced units.

Minor Essential Revisions

METHODS

‘Discontinuation of NIV’
....after normalisation of arterial pH (<7.35)… Should this read (>7.35)?

RESULTS
Tables - ensure correct units for all variables
Table 3 - GSC - should this be GCS - as primary outcome this should be the first row of the table
- Minute volume and exhaled tidal volume - should these rows be the other way round; otherwise the values seem nonsensical
- EPAP - all values should have SD even if 0
- Maximum IPAP - as mentioned earlier
- Base excess - please check the data. There is considerable variation over the time course.

Discretionary Revisions
METHODS
Patients
Why was the sample size chosen? Was a power calculation performed? If so it should be provided.

References
1. Miller SDW, Elliott MW. High inspiratory pressures are tolerated by patients with acute COPD requiring noninvasive ventilation. Eur Respir J. 2009;34(s53):39s.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:
I have previously received expenses for travel to conferences from Philips-Respironics. I have received an honorarium for co-authoring a commissioned article covering AVAPS mode of ventilation for the Global clinical newsletter published by Philips-Respironics. The Lane Fox Clinical Respiratory
Physiology Group, within which I have worked, has received unrestricted research grants from: ResMed, Abingdon, Oxfordshire, UK; Philips-Respironics, Murrysville, PA; Fisher and Paykel Healthcare, Auckland, New Zealand; and B&D ElectroMedical, Stratford-upon-Avon, Warwickshire, UK.