Non-Invasive Ventilation for Acute Hypercapnic Respiratory Failure: an audit in Grantham

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Aim

BTS annual audits have highlighted numerous national variations in the practise of BIPAP, an intervention that can confer an absolute reduction in acute COPD exacerbation mortality of 10%.

The aim was to compare the current practise on the HDU at Grantham and District Hospital (GDH) of BIPAP initiation and management with the new 2016 British Thoracic Society (BTS) guideline, as well as local United Lincolnshire Hospitals NHS Trust (ULHT) 2013 guidelines.

The last local audit of BIPAP at GDH in 2013 showed non-adherence to previous BTS recommendations including time on mask, documentation of escalation plans and initiation of IPAP pressures.

The overall outcome of this repeat audit was to ascertain the best targets for effective quality improvement in this area.

Results

Sample set consisted of diagnosis of COPD of 50% (72% BTS 2013) with an average age 72 years and mortality of 19% (27% BTS 2013).

1. BIPAP is initiated when pH <7.35 and pCO2 >6.5 (after an hour of maximal medical therapy).

13% did not comply with this standard (1 episode complied with extended new BTS guidance; 1 episode was inappropriate).

44% had an initial pH ≤7.26 but none were considered for immediate intubation (but only 1 episode was documented L3 ceiling).

2. BIPAP is started at settings of IPAP 15 and EPAP 3 and up titrated to IPAP of 20-30 over the first 10-30 minutes.

3. BIPAP is continued for 24 hours allowing for minimal breaks only.

25% fell below 6 hours set as minimum ULHT standards.

4. At commencement of BIPAP, an escalation plan or ceiling of care must be clearly documented in the medical notes.

Ceiling of Care Documented

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<thead>
<tr>
<th></th>
<th>BTS 2012</th>
<th>ULHT 2013</th>
<th>ULHT 2016</th>
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<tbody>
<tr>
<td>Level 1</td>
<td>76%</td>
<td>47%</td>
<td>81%</td>
</tr>
<tr>
<td>Level 2</td>
<td>66%</td>
<td>66%</td>
<td>77%</td>
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<tr>
<td>Level 3</td>
<td>17%</td>
<td>11%</td>
<td>23%</td>
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Conclusion

- Monitoring ABGs largely taken at appropriate timings indicating baseline knowledge with regards to the importance of monitoring response on NIV.
- Overall improvement in pH and pCO2 over the first 6 hours of NIV initiation, compared to the local 2013 ULHT audit.
- Marked improvement in ceiling of documentation, largely encouraged by changes in HDU clerking proformas.
- Need to make more importance of the prognostic value of a low pre-treatment pH with regards to initial management for respiratory failure and communication of prognosis.
- Creation of new ‘NIV paperwork’ to be used by nursing staff in order to actively encourage the correct use and escalation of pressures and ensure accurate ABG monitoring.
- Use of education targeting all aspects of the ‘NIV team’ to encourage more active analysis and reaction to monitoring ABG results.

References
