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| **Automated oxygen titration in non-invasive respiratory support therapy: an RCT** |
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| **Introduction/Aim:**  When oxygen titration systems are used with nasal high flow (NHF) oxygen delivery; automated titration improves time spent in a target SpO2 range compared to standard, manually adjusted, titration. It is not known if this improvement is also seen when continuous positive airway pressure (CPAP) or bi-level positive airway pressure (bi-level) are used.  **Method:**  This open-label randomised controlled trial in hospitalised participants requiring one or more of: NHF, CPAP, or bi-level; compared automated to manual oxygen titration. The primary outcome was the proportion of time spent within a target SpO2 range; generally 92 to 96%, or if at risk of hypercapnia, 88 to 92%; where participants achieved ≥8 hours of therapy. The analysis included exploration of whether the difference between automated and manual titration differed by oxygen delivery modality.  **Results:**  Of 69 randomised participants: 62 had data for the primary endpoint, 59 started on NHF; 4 on CPAP; and 6 on bi-level. Median (interquartile range) proportion of time spent within the target SpO2 range with automated oxygen (n=32) was 91.4% (84.3 to 97.5) compared with 75.9% (64.0 to 87.8) with manually adjusted oxygen (n=30); difference (95%CI) 13.9 % (6.2 to 21.2), P<.001. For automated control the mean proportion of time in SpO2 range for NHF, CPAP and bi-level respectively, were: 89%, 88% and 91%; and for manually titrated oxygen: 75%, 79%, and 80%. The difference between automated and manual titration did not depend on delivery modality, P-interaction 0.94.  **Conclusion:**  Automated oxygen titration increased time spent within a target SpO2 range, compared to manual oxygen titration, in medical inpatients requiring oxygen therapy. The difference was seen in all delivery modalities: NHF, CPAP and bi-level therapies and there is no evidence that the difference was itself different depending on the oxygen delivery modality.  **Grant Support:** Fisher and Paykel Healthcare provided a research grant that helped fund this study.    **Key Words:** Automated oxygen, closed loop oxygen control, nasal high flow, non-invasive ventilation  **Word count:** 292/300 (abstract only) |