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| ***Hypercapnia is not excluded by normoxia in neuromuscular disease patients: implications for oximetry.*** |
| Emma Gray1,2, Collette Menadue1, Amanda Piper1, Keith Wong1,2,3, Matthew Kiernan2,4,5, Brendon Yee1,2,3 |
| 1 Department of Respiratory and Sleep Medicine, Royal Prince Alfred Hospital, Camperdown, (NSW), Australia  2 Central Clinical Medical School, The University of Sydney, Camperdown, (NSW), Australia  3 Sleep Research Group, Woolcock Institute of Medical Research, Glebe, (NSW), Australia  4 Department of Neurology, Royal Prince Alfred Hospital, Camperdown, (NSW), Australia  5 Brain and Mind Centre, The University of Sydney, Camperdown, (NSW), Australia |
| **Introduction/Aim:**  Pulse oximetry is widely used in the assessment of chronic respiratory failure (CHRF) in neuromuscular disease (NMD) patients. CHRF is the major cause of morbidity and mortality, necessitating early diagnosis and intervention. Guidelines suggest an arterial blood gas (ABG) is indicated if oxygen saturations (SpO2) ≤ 94% in the absence of lung disease. However, hypercapnia with normoxia (SpO2 ≥ 95%) has been observed on ABGs of patients with NMD, in particular those with motor neurone disease (MND).  **Methods:**  A single-centre retrospective audit of room-air ABGs in stable hypercapnic chronic respiratory failure (CHRF) patients from 1990–2020 was performed. Patients with parenchymal lung disease were excluded. Patients were grouped into three main categories: non-NMD, other-NMD and MND.  **Results:**  Three-hundred-and-six ABGs with hypercapnia from 185 patients with extrinsic restrictive lung disease were analysed. No patients with non-NMD, 65% of other-NMD and 36% of MND patients demonstrated hypercapnia with normoxia (2 83·61; p<0·001). The potential mechanism is proposed to be a difference in calculated respiratory quotient (RQ). If the A-a gradient is assumed to be normal, the calculated RQ was significantly higher in MND patients and other-NMD patients compared with non-NMD patients (estimated-marginal-mean 0·99 [95%CI 0·93–1·03]; 0·88 [95%CI 0·77–0·97]; 0·74 [95%CI 0·64—0·84] respectively; p<0·001) by mixed-model analysis.  **Conclusion:**  Hypercapnia is not excluded in patients with normal oximetry in NMD patients and may be due to an elevated RQ. This has implications in the diagnosis and monitoring of NMD patients with oximetry alone.  **Grant Support:**  Dr Emma Gray received an NHMRC Postgraduate Scholarship. |