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Title: Correspondence between clinical prediction and outcome in patients with acute hypercapnic respiratory failure (AHRF) due to restrictive lung disease

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Body: Introduction: Non-invasive ventilation (NIV) is widely used for the treatment of patients in decompensated ventilatory failure due to Restrictive Lung disease (RLD: thoracic cage and neuromuscular diseases) with AHRF in acute hospitals in the United Kingdom. The information on the accuracy of clinical prediction of survival of patients presenting with AHRF secondary to RLD is scarce. Aims: We set out to establish how well the clinical prediction of poor prognosis during admission leading to use of NIV as "ceiling of care" with AHRF from RLD correlates with the actual outcome. Method: A scientific survey was undertaken of 331 admissions due to AHRF secondary to RLD over a 6-year period ending 31 October 2010, to our 11-bedded ward based NIV unit (catchment population = 450000 approx.). In-hospital mortality was established in patients who were clinically assigned ward-based NIV as "ceiling of care" and compared with that in those considered clinically suitable for further escalation to intubation and invasive ventilation on Critical Care Unit if needed. Results: In the 331 episodes, the odds ratio of death in the "ceiling of care" group versus the escalation group was 4.41 and was highly significant ($p<0.000001$). Conclusion: Our data suggest good correspondence between clinical prediction and outcome in patients with AHRF due to RLD - further prospective studies are needed to establish this in detail. As NIV is increasingly used acutely on critically ill patients beyond the originally supposed indication of AHRF in selected patients (and even in palliative care), the use of NIV as the "ceiling of care" needs consistent monitoring.