Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Caveats of pressure control: lung non-protective ventilation

Editor—Lung-protective ventilation (LPV), in which the tidal volume is restricted to 6 ml kg^{-1} and the plateau pressure to <30 cm H_2O, is the accepted standard of care for patients with acute lung injury (ALI) and the acute respiratory distress syndrome (ARDS). A growing body of evidence supports the implementation of LPV in patients with other forms of acute respiratory failure and even in patients with healthy lungs undergoing general anaesthesia for elective surgery. The evidence behind LPV is largely based upon studies that have used volume-controlled modes of mechanical ventilation. Pressure-controlled modes of ventilation offer the theoretical advantages of better patient–ventilator synchrony and improved patient comfort. However, in critically ill patients, airway resistance and lung compliance change on a minute-to-minute basis; therefore, the delivery of a fixed inspiratory pressure may result in gross under- or over-ventilation. Although pressure-controlled modes of ventilation have been the mainstay of ventilation bundles in British intensive care units (ICUs) for decades, conciliating this strategy with a lung-protective model may prove difficult.

Our large medical/surgical ICU is located in a tertiary care centre. A Bi-level/pressure support-based, nurse-led ventilation strategy is the default for all patients, with patients generally weaned from Bi-level to pressure support as soon as able. We retrospectively analysed data extracted from the electronic patient records of 200 mechanically ventilated patients sequentially admitted to ICU for mechanical ventilation during a 6 month period (November 2013–April 2014). The tidal ventilation administered was determined by averaging the hourly tidal volume recorded over the first 24 h of admission. An 'ideal' tidal volume (6 ml kg^{-1}) was calculated for each patient based on ideal body weight. The average age of the study population was 58, with an average duration of mechanical ventilation of 4.1 days and an ICU length of stay of 6.1 days: 43% of patients were admitted after abdominal or vascular surgery; 29% of patients were ventilated for neurological protection; 20% of patients had ALI/ARDS on admission; and 5% had community-acquired pneumonia.

Analysis of the data revealed that average tidal volume received by the patients during their first 24 h of admission was 536 (40) ml, which represents an excess of 88.2 (30) ml over the 'ideal' lung-protective tidal volume ($P<0.05$). Moreover, in patients with ALI/ARDS, the tidal volume delivered was 544 ml (30), which represents an excess of 95 (25) ml ($P<0.05$) over ideal volumes. These figures demonstrate that, in our institution, the application of a pressure control-based ventilation strategy resulted in the delivery of ventilation significantly larger than the recommended LPV standard. This effect was observed in both mandatory (Bi-level) and spontaneous (pressure support) modes of ventilation.

While the effect of restricting tidal volumes to 6 ml kg^{-1} in spontaneously ventilating patients remains controversial, given the state of the evidence, it seems reasonable to adhere to LPV recommendations at least in the initial acute stage of respiratory failure, where the potential for ventilation-induced lung injury is highest. Achieving this with the use of pressure-control-based ventilation requires regular and meticulous titration of pressures, significantly increases the nursing workload, and, as demonstrated by our results, may be ultimately unfeasible in a busy tertiary referral centre. The recently developed dual-control modes of ventilation, which are pressure-based but have auto-regulation mechanisms that restrict delivered volumes, may represent a promising middle ground that warrants further assessment in the clinical setting.

Declaration of interest

None declared.

I. de Asua*
S. McKechnie
Oxford, UK
E-mail: ignaciodeasua@yahoo.co.uk

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Indications of extracorporeal life support in poly-trauma

Editor—Major trauma is a leading cause of death, particularly among young patients. New strategies in management are needed to improve poor outcome of severe trauma. Conventional therapies for post-traumatic cardiovascular shock and acute pulmonary failure may sometimes be insufficient and even dangerous.[1 2] New approaches in trauma care and advanced treatments are needed to modify the actual therapeutic strategy and treatment protocols. Extracorporeal life support (ECLS) has proven to be effective in acute cardiopulmonary failure of different aetiologies, in particular when conventional therapies fail.[3–5]

We are using ECLS as a rescue therapy in severe poly-trauma patients with a refractory clinical setting (cardiogenic shock, cardiac arrest, and/or pulmonary failure): the rationale for using ECLS in trauma patients is to treat refractory pulmonary and cardiopulmonary failure, providing adequate systemic perfusion, avoiding consequent multi-organ failure, and permitting organ recovery.[6 7] From our experience, we have identified several pre-ECLS patient characteristics useful in predicting ECLS treatment appropriateness.