EDITORIAL

Prolonged Mechanical Ventilation (PMV): When is it Justified in ICU?

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Over years, the number of patients requiring prolonged mechanical ventilation (PMV) in ICU has increased. Trends in the numbers of patients requiring PMV are of interest to health service planners because they consume a disproportionate amount of healthcare resources, and have high illness costs. PMV is defined as need of invasive mechanical ventilation for consecutive 21 days for at least 6 hours per day. With improvement in ICU care more patients survive acute respiratory failure and with that number of patients requiring PMV is likely to increase further. In a large multicentric study in United Kingdom the incidence PMV was 4.4 per 100 ICU admissions, and 6.3 per 100 ventilated ICU admissions. Also these patients used 29.1% of all general ICU bed days, had longer hospital stay after ICU discharge than non-PMV patients and had higher hospital mortality (40.3% vs 33.8%, P = 0.02).²

There are no evidence-based predictors that can reliably identify patients who will require PMV but following factors are identified ICU admissions due to pneumonia, ARDS, neuromuscular diseases, head trauma, high disease severity scores on admission, prolonged hospital admission prior to mechanical ventilation, history of obstructive/restrictive lung disease, CO₂ retention, low serum albumin, deranged renal parameters, temperature and WBC counts on admission in addition to advanced age.³ Hypophosphatemia, hypomagnesemia, and hypocalcemia have been associated with respiratory muscle weakness. Other factors responsible are presence of sepsis/SIRS, poor nutrition and psychological fear. It is important to anticipate which patients among all patients requiring mechanical ventilation in ICU will go on to need PMV. Factors associated with prolonged mechanical ventilations are complications like DVT, sepsis, stress ulcers, aspiration and also iatrogenic factors like-failure to recognize withdrawal potential and inappropriate ventilator settings causing excessive loads or discomfort, absence of weaning protocols and presence of systemic diseases, chronic co-morbidities (e.g., malignancy, chronic obstructive pulmonary disease, immunesuppression), non-pulmonary organ failure and anxiety/depression on part of patient.⁴,⁵

In the present issue of journal, Vora, et al have addressed this issue and made an attempt to identify those requiring PMV among diverse group of patients in ICU and study their profile and outcome.⁶ As the study duration was 18 months the total number of patients requiring PMV is small. Majority of patients were under 40 years of age. This may be due to the fact that the study was conducted in public hospital where ICU patients tend to be younger than ICU patients in private setup. Also the reason for requiring PMV was neurological disease in majority of patient in this study as it was in Medical ICU in tertiary care centre where patients with COAD, restrictive lung disease and head injury are managed in other ICUs. This may not be the case in hospitals with single ICU. Also severity of illness on admission was less as sizable patients had reversible neurological disease with sparing of other systems. A number of electrolyte disturbances were seen in patients from present study but if they contributed to prolonged need of mechanical ventilation needs to be determined. As expected complications like ventilator associated pneumonia (VAP) lead to increase in mortality.⁷

Over all it is a well planned study focussing on a small group of ICU patients who consume a significant chunk of ICU resources. In another study from respiratory care unit from India, median duration of mechanical ventilation in Guillain-Barré syndrome patients with respiratory failure was 38 days and mortality was related to systemic disease and complication of hospitalization rather than primary disease.⁸ Future studies should be designed at finding prognosis in this diverse group of patients to help identify patients who will eventually benefit from ICU stay in resource-limited set up.

In some countries, specialised weaning units have been established to manage patients who are stable except for the requirement for PMV. Potential advantages of these
were independent and living at home; however these finding are not replicated uniformly in other studies and long term outcome depends on patient profile.

Further research is needed to evaluate more detailed economic evaluation. To date, published reports from US centres support possible improvements in some outcomes, and a reduction in costs with establishment of weaning units for patients with PMV who do not need “active” ICU management barring mechanical ventilation. For patients who are facing possible tracheostomy and long-term ventilator dependence, a meeting with the patient’s relatives is essential to review their goals and preferences in the context of their expected prognosis and quality of life. Transfer of patients to specialized units help some PMV patients by providing quiter environment, allowing participation from family, dedicated muscle training, well planned attempts of weaning and more time for counseling. Establishing a weaning unit would potentially liberate 8-10% of ICU beds for other acutely ill patients.

Increasing economic burden and pressure for availability of ICU beds makes it unrealistic to cater to PMV in ICU for all the patients. There is urgent need to introduce weaning units with more and more patients requiring PMV following aggressive resuscitation. With increasing population of patients requiring PMV on one side and economic, administrative and ethical problems associated with keeping such patients to occupy “precious” ICU bed on other side there is need to identify alternative areas like long term facilities where some of such patients can be cared for.

References
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