ICU-acquired weakness — a call to arms (and legs)

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Rehabilitation in the intensive care unit that includes exercise and early mobility is currently a hot topic in the critical care literature. This is a result of reports of ICU survivors having a relatively poor quality of life, due to prolonged weakness that may last up to 5 years after ICU discharge.[1-3] With over 40 citations in the past 12 months, there is a growing body of literature addressing the topic of ICU-acquired weakness (ICUAW), with taxonomy consensus conferences and round table meetings devoted to defining the problem, identifying appropriate assessment and diagnostic approaches, and testing interventions.

Intuitively, we understand that immobility is not good for ICU patients. Local and systemic inflammation acts synergistically with bed rest and immobility in the critically ill to produce alterations in metabolic and structural function of muscle, resulting in muscle atrophy and contractile dysfunction.[4] Immobility also contributes to the pro-inflammatory state experienced by patients who are critically ill.[4] The ICUAW syndrome can manifest as prolonged weaning time from mechanical ventilation, inability to mobilise, and reduced functional capacity. Alarmingly, the incidence of ICUAW has been reported at 25%–60% in patients mechanically ventilated for more than seven days[5] — a rate much higher than for ventilator-associated pneumonia, deep vein thrombosis or central line-associated bacteraemia, which have well described preventive bundles of care.

There is a contemporary groundswell of support from investigators in different countries for the provision of early rehabilitation in the ICU. From these reports we can conclude that exercise and early mobility are safe and feasible,[6-8] even for patients with an endotracheal tube in situ. Rehabilitation has also reduced ICU and hospital lengths of stay and improved physical function at hospital discharge.[7,9,10] However, an important pragmatic lesson from these studies is that rehabilitation in the ICU requires a team approach, and a cultural shift from the current paradigm of ICU care in Australia and New Zealand towards the "ABCDE" approach described in a recent editorial (Awakening and Breathing Coordination of daily sedation and ventilator removal trials; Choice of sedative or analgesic exposure; Delirium monitoring and management; and Early mobility and Exercise).[11] For patients to participate in rehabilitation they must be awake, alert and co-operative. This requires a holistic strategy that involves managing pain and sedation practices, early recognition and treatment of delirium, and making exercise a priority in the daily ICU plan, not just a discretionary, ad hoc element of care.

So what must happen for this culture shift to occur? Initially we need improved collaboration and communication between members of the multidisciplinary team to work towards the common goal of early rehabilitation for our ICU patients. Physiotherapists must also accept that traditional treatment roles and priorities have changed. Our collective research agenda requires rigorous and systematic outcome data to determine the incidence of ICUAW and functional impairment in Australian and New Zealand ICUs. This includes data from routine assessment and documentation of Medical Research Council muscle scoring and activity levels for relevant patients in the ICU. Observational data will also establish baseline levels of activity and practices. The effect of rehabilitation interventions on physical and functional outcomes at and beyond hospital discharge will then require pilot testing. Results of this testing will enable identification of patients who respond to rehabilitation as potential candidates for future trials.

Survival is no longer the sole outcome of importance in ICU. Patients, families and the community will not be satisfied if the legacy of an episode of critical illness is poor quality of life, muscle weakness, physical incapacity and cognitive dysfunction. Both hospital and community-based health practitioners require increased awareness of this post-intensive care syndrome. For patients who already exhibit these problems, post-discharge rehabilitation strategies must be considered.

The bad news for our professional community is that this problem is likely to get worse. The ICU of the near future will manage increasingly more complex patients, including older patients with increasing comorbid conditions. We must therefore establish a culture of early systematic rehabilitation that results in better long-term outcomes for our patients, and a research agenda that identifies valid outcome measures and optimal treatment strategies. The time to act is now.

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