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Intensive care: what should we measure?

EDITORIAL

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More clinical intensive care studies are needed with outcome measures that are relevant to patients.

Current intensive care practice has a much more solid empirical knowledge base than 20 years ago. Results from robust clinical studies have taught us that interventions based solely on insights into pathophysiology and pharmacology do not necessarily increase survival rates, and sometimes increase the risk of mortality. For patients on mechanical ventilation, this means that gentle ventilation trumps normalisation of blood gases, and that aggressive fluid resuscitation is best avoided for patients with septic shock. The term 'less is more' has become a recurring theme (1).

When examining the effects of various interventions in patient populations with high mortality rates, the study design and calculation of statistical power should take into account that such interventions can impact on mortality. The consequence is often that survival is defined as the primary endpoint in such studies, even when researchers are more concerned with other outcome measures. This creates a number of dilemmas and methodological challenges.

In this issue of the Journal of the Norwegian Medical Association, Klem et al. present a systematic review and meta-analysis of research on the effects of early rehabilitation, i.e. mobilisation and inspiratory muscle training while the patient is still in the intensive care unit (2). The analysis appears to provide evidence that early mobilisation is safe, in that it does not negatively impact on survival, and can reduce both the time spent in hospital and the duration of mechanical ventilation.

How robust are these findings? For hospital mortality, the authors find an odds ratio of 0.9 for patients who are mobilised early, with a 95 % confidence interval ranging from 0.61 to 1.33, i.e. covering both a significantly reduced risk and a significantly increased risk. This illustrates that the overall volume of information in the available literature is still quite modest, which would be revealed by a trial sequential analysis (1).

It could be questioned whether the other outcome measures, length of hospital stay and duration of mechanical ventilation, are of significance to individual patients. Variation in survival at group level can also lead to misinterpretations of such measures due to competing risks, e.g. where a higher mortality rate among patients in one of the intervention groups impacts on estimates of the duration of mechanical ventilation (3, 4).

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We now know that serious illness and intensive care can have long-term consequences. The term 'post-intensive care syndrome' is used to describe a collection of physical, mental and cognitive impairments that many survivors will experience (5). What elements of intensive care can help reduce the risk of such sequelae after intensive care? Early rehabilitation is one measure that is assumed to improve long-term outcomes in intensive care patients (6). Mobilisation can also have a positive effect on mental health by enabling patients to gain contact with, and eventually control over, their own body, giving them an increasing sense of self-control (7).

Anyone who has cared for patients with increased intracranial pressure or severe respiratory failure knows that a patient's monitor can start flashing red following just a little external manipulation. This can lead to reluctance to involve physiotherapists and others for fear of destabilising a poorly patient (8). It is therefore important to demonstrate that such interventions are not harmful to patients. This creates a dilemma: studies with survival as the primary endpoint must be designed with sufficient statistical strength to allow detection of any effect on survival. This requires a fairly large, and therefore heterogeneous patient sample.

However, secondary outcome measures, such as self-reported quality of life, physical function and mental health, are just as relevant for this type of intervention. In recent years, a great deal of work has been done to validate and standardise such outcome measures, the timing of evaluations and how these outcome measures should be examined (9). It is our view, therefore, that the review by Klem et al. highlights the need for clinical studies with high methodological quality and a greater emphasis on outcome measures that are relevant to patients.

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