

Commentary

Understanding the lingering consequences of what we treat and what we do

Derek C Angus

Professor and Vice Chair, Department of Critical Care Medicine, Director, The CRISMA Laboratory, University of Pittsburgh School of Medicine, Pittsburgh, Pennsylvania, USA

Correspondence: Derek C Angus, angusdc@ccm.upmc.edu

Published online: 3 March 2004

Critical Care 2004, **8**:103-104 (DOI 10.1186/cc2838)

This article is online at <http://ccforum.com/content/8/2/103>

© 2004 BioMed Central Ltd (Print ISSN 1364-8535; Online ISSN 1466-609X)

Abstract

Granja and colleagues have helped us by showing that long-term follow-up is feasible and by trying to tease out whether select intensive care unit patient populations are at particular risk of adverse outcomes. This work gives us clues for future investigations which will hopefully interrogate further the potential mechanisms of action that underlie poor long-term outcomes. In the meantime, we can hope that this quality of follow-up will move from the research arena to become a part of routine clinical care.

Keywords critical illness, intensive care unit, quality of life, sepsis

In the present issue of *Critical Care*, Granja and colleagues present their findings regarding the quality of life of patients who survived an intensive care unit (ICU) episode of care for severe sepsis compared with other ICU survivors [1]. They used the EQ-5D instrument to measure quality of life 6 months after discharge and found that quality of life was generally poor and not noticeably different between sepsis survivors and other ICU survivors. Several points come to mind when reading this work.

The authors are to be commended for the rigor with which they have followed up their ICU patients. This is only one of several studies from this group, and their findings have further stressed that discharge from the ICU alive is not necessarily the same thing as an immediate return to full health and happiness [2–4]. As intensive care grows to become a larger part of acute care health delivery, it is crucial to understand the value of our care and the outcomes of our patients on a human and social dimension. For example, 2% of the entire US adult population now cycles through intensive care every year [5]. At this volume, any unwanted lingering consequences of either critical illness or ICU interventions will be writ large across the entire public health of a given community. It is therefore our responsibility, as the guardians of critical illness and as the providers of critical

care, to fully delineate, measure, interrogate and, ultimately, mitigate all unwanted consequences of the 'ICU diseases'. The first step, obviously, is to not be satisfied simply with getting the patient out of the ICU alive, but to know more about what happens subsequently and why [6].

The authors of the current study showed that little more than one-half of their patients had returned to usual activities at 6 months after discharge, and one-third to one-half were in worse health than one year earlier. These findings are not uncommon for ICU follow-up studies, and they definitely suggest ICU survivors are different from the general public. However, patients who come into the ICU are not randomly selected from the general population in the first place. It is difficult to know whether these patients have any new decrement in quality of life and health status, or whether their poor outcomes are part of inherently poor health status streams that were already in decline prior to ICU admission.

Some studies, either by limiting inclusion to previously healthy subjects or by reporting results separately for previously healthy subjects, have certainly suggested that protracted intensive care for an acute illness does result in new, sustained decrements in quality of life and in health status [7–9]. It would be interesting to know whether the one-third of patients in this

study who were previously healthy fared similarly. Regardless, it seems probable that, in at least some portion of patients, there is a new decrement. Our efforts should now therefore begin to move away from simply documenting this problem to better understanding why it happens.

The current study suggests that there was no obvious difference between septic ICU patients and nonseptic ICU patients. While this is helpful, there were important differences between the two groups, which may preclude drawing strong inferences. For example, many of the control patients were admitted postoperatively, while the septic cases were predominantly medical patients admitted with a primary problem of infection and organ dysfunction. In addition, when one posits 'why' sepsis may have lingering consequences, the various debilitating effects of the associated 'cytokine storm' are strong candidates. Yet many of the ICU controls may have similarly suffered profound inflammatory insults, and so some of the potential mechanisms for poor long-term health and quality of life may have been present in both the cases and the controls.

So how do we tease this out? Fundamentally, we have to begin articulating and testing specific hypotheses about why health status and quality of life may be poor post ICU discharge. We must subtract the 'background noise' of pre-existing conditions, and must specifically explore both the potential mechanisms of action for new decrements and the numerous interactions between different downstream outcomes. For example, how rapidly do we lose lean muscle mass when sick and 'cytokine-emic' in the ICU? How effectively do we replete lean muscle mass during convalescence? How often does loss of lean muscle mass impair critical physical functions, such as getting in and out of bed or a chair? How often, and in whom, does change in physical capability domino into impaired mental and mood status? Which ICU patient groups are most susceptible to any of these events, and who is most susceptible to the entire chain of events? Similar questions might be asked about mood, neurocognition, and organ system function for all the 'classic' organ dysfunction syndromes of critical illness.

Finally, although I think greater insight into the mechanisms of action underlying poor long-term outcomes will be extremely helpful, I do not propose that we be paralyzed clinically in the meantime. Jones and colleagues recently showed that a relatively simple intervention aimed at promoting improved rehabilitation may improve recovery from critical illness [10]. Other service delivery packages, without specific knowledge of the mechanism of action, have also proven helpful in analogous groups of patients, such as survivors of traumatic brain injury or stroke, and frail geriatric populations [11–13]. Even outside the clinical trials, the simple act of bringing our knowledge and expertise to the ICU survivor once she has left the ICU may enhance the quality of care for that patient [14] and may provide important feedback to the ICU practitioner.

In summary, Granja and colleagues have helped us by showing that long-term follow-up is feasible and by trying to tease out whether select ICU patient populations are at particular risk of adverse outcomes. This work gives us clues for future investigations that will hopefully interrogate further the potential mechanisms of action that underlie poor long-term outcomes. In the meantime, we can hope that this quality of follow-up will move from the research arena to become a part of routine clinical care.

Competing interests

DCA has received grant support from NHLBI (R01 HL69991 and R01 HS/HL11620), AHRQ (R01 HS/HL11620), and NIGMS (R01 GM61992) to determine intermediate and long-term outcomes of critical illness.

References

1. Granja C, Dias C, Costa-Pereira A, Sarmento A: **Quality of life of survivors from severe sepsis and septic shock may be similar to that of others who survive critical illness.** *Crit Care* 2004, **8**: R91-R98.
2. Granja C, Cabral G, Pinto AT, Costa-Pereira A: **Quality of life 6-months after cardiac arrest.** *Resuscitation* 2002, **55**:37-44.
3. Granja C, Teixeira-Pinto A, Costa-Pereira A: **Quality of life after intensive care – evaluation with EQ-5D questionnaire.** *Intensive Care Med* 2002, **28**:898-907.
4. Granja C, Morujao E, Costa-Pereira A: **Quality of life in acute respiratory distress syndrome survivors may be no worse than in other ICU survivors.** *Intensive Care Med* 2003, **29**:1744-1750.
5. Kersten A, Milbrandt EB, Rahim MT, Watson RS, Clermont G, Angus DC, Linde-Awirble WT: **How big is critical care in the US? [Abstract].** *Crit Care Med* 2003, **31** (Suppl):A8.
6. Angus DC, Carlet J, on behalf of the 2002 Brussels Roundtable Participants: **Surviving intensive care: a report from the 2002 Brussels Roundtable.** *Intensive Care Med* 2003, **29**:368-377.
7. Angus DC, Musthafa AA, Clermont G, Griffin MF, Linde-Zwirble WT, Dremsizov TT, Pinsky MR: **Quality-adjusted survival in the first year after the acute respiratory distress syndrome.** *Am J Respir Crit Care Med* 2001, **163**:1389-1394.
8. Herridge MS, Cheung AM, Tansey CM, Matte-Martyn A, Diaz-Granados N, Al Sadi F, Cooper AB, Guest CB, Mazer CD, Mehta S, Stewart TE, Barr A, Cook D, Slutsky AS: **One-year outcomes in survivors of the acute respiratory distress syndrome.** *N Engl J Med* 2003, **348**:683-693.
9. Davidson TA, Caldwell ES, Curtis JR, Hudson LD, Steinberg KP: **Reduced quality of life in survivors of acute respiratory distress syndrome compared with critically ill control patients.** *JAMA* 1999, **281**:354-360.
10. Jones C, Skirrow P, Griffiths RD, Humphris GH, Ingleby S, Eddleston J, Waldmann C, Gager M: **Rehabilitation after critical illness: a randomized, controlled trial.** *Crit Care Med* 2003, **31**: 2456-2461.
11. Pace GM, Schlund MW, Hazard-Haupt T, Christensen JR, Lashno M, McIver J, Peterson K, Morgan KA: **Characteristics and outcomes of a home and community-based neurorehabilitation programme.** *Brain Injury* 1999, **13**:535-546.
12. Duncan P, Studenski S, Richards L, Gollub S, Lai SM, Reker D, Perera S, Yates J, Koch V, Rigler S, Johnson D: **Randomized clinical trial of therapeutic exercise in subacute stroke.** *Stroke* 2003, **34**:2173-2180.
13. Cohen HJ, Feussner JR, Weinberger M, Carnes M, Hamdy RC, Hsieh F, Phibbs C, Courtney D, Lyles KW, May C, McMurtry C, Pennypacker L, Smith DM, Ainslie N, Hornick T, Brodtkin K, Lavori P: **A controlled trial of inpatient and outpatient geriatric evaluation and management.** *N Engl J Med* 2002, **346**:905-912.
14. Ball C, Kirkby M, Williams S: **Effect of the critical care outreach team on patient survival to discharge from hospital and re-admission to critical care: non-randomised population based study.** *BMJ* 2003, **327**:1014-1017.