

COMMENTARY

Octogenarians in the ICU: are you ever too old?

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See related research by Roch *et al.*, <http://ccforum.com/content/15/1/R36>

Abstract

Long-term morbidity and mortality rates for older patients admitted to the ICU remain substantial. In this issue of *Critical Care*, Roch and colleagues describe a retrospective study evaluating factors associated with survival and quality-of-life of octogenarians (aged ≥ 80 years) admitted to a medical ICU. This study proposes to address a highly relevant and increasingly encountered scenario in ICUs - what factors can best estimate prognosis for elderly patients at the time of evaluation for ICU admission? While perhaps not unique to octogenarians, such data have the potential to better inform on decision-making regarding advanced life support along with facilitating discussion on the perceived benefit and on patient treatment preferences concerning intensive care.

Despite advances in the support for older critically ill patients, the long-term morbidity and mortality rates remain substantial. In this issue of *Critical Care*, Roch and colleagues [1] present a retrospective cohort study evaluating the long-term survival and quality of life of 299 octogenarians (aged ≥ 80 years) admitted to a single French medical ICU over a 6-year period. The authors describe hospital and 2-year mortality rates of 55% and 79%, respectively. This observed mortality was significantly higher than the age and sex-matched general population. While higher illness severity score (Simplified Acute Physiology Score (SAPS) II) and the presence of fatal disease (McCabe score) were independently associated with in-hospital and 2-year mortality, surprisingly, the presence of pre-morbid functional limitation, though present in 85% of patients, was found to have little association. Of 133 surviving the index hospitalization, quality of life was prospectively assessed in 24 patients

(18.0%) a median 5.3 years after hospital discharge, where overall scores for physical function were greatly reduced.

While these findings are provocative and extend our knowledge of the outcomes for elderly patients suffering an episode of critical illness, this study also has important limitations that challenge its inferences and overall generalizability. First, it reflects a relatively small cohort of elderly patients admitted to a single tertiary medical ICU in France. Second, this study does not directly provide insight on the prognostic impact of age alone on long-term outcome after critical illness, due to lack of controls for comparison. Third, while 12.4% of all admissions to this ICU were aged ≥ 80 years, we do not know the prevalence of age-matched patients referred to, but not admitted to ICU, thus making these observations potentially susceptible to selection bias. In total, 23% of patients were classified as having treatment limitations, in terms of not being offered mechanical ventilation or renal replacement therapy; however, there is no clear information on other aspects of advanced care and/or end-of-life planning. Fourth, the intent of determining prognostic factors for long-term quality-adjusted survival at the time of evaluation for ICU admission is unmistakably important. However, it is made difficult in this study by omitting potentially important time-varying factors or other significant events that may have occurred after hospital discharge, such as repeated episodes of critical illness, hospitalization, or institutionalization. Finally, interpretation of the quality-of-life data is challenging due to the variable follow-up duration and the susceptibility to selection and recall bias.

Despite these limitations, these data do provide further insight into the survival experience of critically ill octogenarians supported in an ICU [1]. One implication of these findings is that selected clinical factors at the time of evaluation for ICU admission may be able to provide a glimpse of short- and long-term prognosis for sick elderly patients and allow for better informed decision-making on advanced life support in the ICU. These were largely based on illness severity scores and advanced chronic illness.

Patient severity of illness has been shown to be an important determinant of outcome of critically ill patients, including in the elderly [2-4]. However, elderly

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patients have generally been under-represented in the development and validation of illness severity scoring systems. Likewise, the attributable mortality for age alone has been inconsistent and appears to have diminished discriminatory power after adjustment for other clinical factors such as primary diagnosis, illness severity, comorbidity and functional status [3].

Prior investigations have found one of the strongest predictors of survival and functional recovery after critical illness in octogenarians is a patient's pre-morbid functional status and/or disposition (that is, chronic care facility) [2,5]. One explanation may be that pre-existing functional impairment reflects a diminished repertoire of homeostatic responses to environmental stressors due to loss of physiologic reserve. Consequently, an episode of critical illness occurring in the frail elderly patient may be more likely to culminate in prolonged hospitalization, need for long-term institutionalization or death [6].

In the current study, the observed association between pre-morbid status and outcome may have been negatively influenced by the high prevalence of functional limitation and pre-existing fatal disease, as assessed by the Knaus and McCabe scores, respectively. For example, 57% of the patients had diseases associated with survival of less than 5 years, and 85% had some functional limitation, with 44% classified as either severe or bedridden [1]. These factors may have also influenced the higher observed mortality at 2 years when compared to other similar studies [3,5,7]. The cumulative and subtle losses to independence and vulnerability to adverse event reflecting the loss of reserve can have a powerful impact on ICU outcome, as has been seen in the geriatric outpatient population [8,9].

Unfortunately, the available literature does not provide for clear discrimination between elderly patients who will survive with a satisfactory quality of life or will either die or have severe functional limitations and reduced quality of life. Determination of prognosis early in the course of a patient presenting with critical illness is challenging and there are no reliable markers that distinguish survivors from non-survivors at the time of ICU admission [4]. Consequently, in the absence of highly specific predictors of poor outcome that could better inform decision-making on the suitability of ICU admission, it is ethically challenging to deny the potential benefits of ICU support on the basis of medical futility, poor outcome or non-maleficence. The observations in this study would appear to support this notion [1].

Alternatively, observational data have suggested physician perception strongly influences patient outcome. Physician belief that life support is not wanted or that survival is unlikely is strongly associated with death and may have enormous effects on the decision-making around limitation or withdrawal of support [10].

Unfortunately, these influences are often difficult to elicit and adjust for in observational studies and have the potential to introduce bias. Notably, in this study, 23% had some limitation on support while in the ICU; however, no specific data were available on advanced or end-of-life care directives [1].

Interestingly, in those studies reporting on the quality of life of octogenarians following recovery from critical illness, at least in highly selected groups, most report a perceived quality of life similar to the age-matched general population, often describe themselves as 'happy' and would accept further ICU treatment if it was required, despite some limitations in physical function and worsening levels of dependence [7,11,12]. Indeed, while the quality-of-life assessment in this study found deficits in physical function, the scores for emotional and social well-being were relatively preserved and encouraging [1].

Two large multi-center prospective observational studies will certainly add to our understanding of the quality-adjusted survival and decision-making process for critically ill octogenarians confronted with ICU admission. The French Intensive Care Unit Admission Decisions in the Elderly (ICE-CUB) trial has recently completed enrollment ($n = 2,643$) and will provide important insights into the decision-making processes for appropriateness of ICU admission and short- and long-term functional outcomes for critically ill octogenarians presenting to the emergency department [13]. The Canadian multi-center prospective Realities, Expectations and Attitudes to Life Support Technologies in Intensive Care for Octogenarians (REALISTIC-80) study is ongoing and will also provide significant insight into the long-term survival and quality of life of patients along with attain family caregivers' perspective on the quality of care [14].

The relevance of prognostication at the time of ICU admission for elderly patients will increasingly become more apparent, as ICUs are confronted with an aging population coupled with high societal expectations of the health care system, and data demonstrating the recent increase in utilization of critical care resources by the elderly [2,15,16]. Importantly, these data should also serve to underscore the critical importance of advanced care planning for elderly patients, including open discussion of the risk/benefit profile of ICU support in the context of perceived benefit and treatment preferences [17].

Competing interests

The authors declare that they have no competing interests.

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References

1. Roch A, Wiramus S, Pauly V, Forel J, Guervilly C, Gannier M, Papazian L: **Long-term outcome in medical patients aged 80 or over following admission to an intensive care unit.** *Crit Care* 2011, **15**:R36.
2. Bagshaw SM, Webb SA, Delaney A, George C, Pilcher D, Hart GK, Bellomo R: **Very old patients admitted to intensive care in Australia and New Zealand: a multi-centre cohort analysis.** *Crit Care* 2009, **13**:R45.
3. de Rooij SE, Govers A, Korevaar JC, Abu-Hanna A, Levi M, de Jonge E: **Short-term and long-term mortality in very elderly patients admitted to an intensive care unit.** *Intensive Care Med* 2006, **32**:1039-1044.
4. Sinuff T, Adhikari NK, Cook DJ, Schunemann HJ, Griffith LE, Rocker G, Walter SD: **Mortality predictions in the intensive care unit: comparing physicians with scoring systems.** *Crit Care Med* 2006, **34**:878-885.
5. Boumendil A, Maury E, Reinhard I, Luquel L, Offenstadt G, Guidet B: **Prognosis of patients aged 80 years and over admitted in medical intensive care unit.** *Intensive Care Med* 2004, **30**:647-654.
6. Makary MA, Segev DL, Pronovost PJ, Syin D, Bandeen-Roche K, Patel P, Takenaga R, Devgan L, Holzmueller CG, Tian J, Fried LP: **Frailty as a predictor of surgical outcomes in older patients.** *J Am Coll Surg* 2010, **210**:901-908.
7. Tabah A, Philippart F, Timsit JF, Willems V, Francois A, Leplege A, Carlet J, Bruel C, Misset B, Garrouste-Orgeas M: **Quality of life in patients aged 80 or over after ICU discharge.** *Crit Care* 2010, **14**:R2.
8. McDermid RC, Bagshaw SM: **Prolonging life and delaying death: the role of physicians in the context of limited intensive care resources.** *Philos Ethics Humanit Med* 2009, **4**:3.
9. Rockwood K, Song X, MacKnight C, Bergman H, Hogan DB, McDowell I, Mitnitski A: **A global clinical measure of fitness and frailty in elderly people.** *CMAJ* 2005, **173**:489-495.
10. Rocker G, Cook D, Sjøkvist P, Weaver B, Finfer S, McDonald E, Marshall J, Kirby A, Levy M, Dodek P, Heyland D, Guyatt G; Level of Care Study Investigators; Canadian Critical Care Trials Group: **Clinician predictions of intensive care unit mortality.** *Crit Care Med* 2004, **32**:1149-1154.
11. Montuclard L, Garrouste-Orgeas M, Timsit JF, Misset B, De Jonghe B, Carlet J: **Outcome, functional autonomy, and quality of life of elderly patients with a long-term intensive care unit stay.** *Crit Care Med* 2000, **28**:3389-3395.
12. de Rooij SE, Govers AC, Korevaar JC, Giesbers AW, Levi M, de Jonge E: **Cognitive, functional, and quality-of-life outcomes of patients aged 80 and older who survived at least 1 year after planned or unplanned surgery or medical intensive care treatment.** *J Am Geriatr Soc* 2008, **56**:816-822.
13. ClinicalTrials.gov: **Intensive Care Unit (ICU) Admission Decisions in the Elderly : the ICE-CUB Study (IceCub)** [<http://clinicaltrials.gov/ct2/show/NCT00912600>]
14. CARENET [<http://www.thecarenet.ca/>]
15. Diem SJ, Lantos JD, Tulskey JA: **Cardiopulmonary resuscitation on television. Miracles and misinformation.** *N Engl J Med* 1996, **334**:1578-1582.
16. Department of Economic and Social Affairs, United Nations: **World Population Ageing: 1950-2050** [<http://www.un.org/esa/population/publications/worldageing19502050/>]
17. Detering KM, Hancock AD, Reade MC, Silvester W: **The impact of advance care planning on end of life care in elderly patients: randomised controlled trial.** *BMJ* 2010, **340**:c1345.

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