Commentary

Acute respiratory failure in the elderly

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Abstract

With the current epidemiology of a growing advanced-age population and the specificities of critical illness in elderly patients, studies on this topic are appropriate. We need more clinical trials and evaluations of diagnostic and management procedures applied in the elderly, as well as studies designed to identify prognostic factors for inhospital mortality or mortality in the intensive care unit in the elderly. Studies evaluating long-term outcomes, including quality of life and costs, are also needed to try to define realistic goals for patients, families and physicians.

The elderly population is growing in developed countries. For example, in the United States the population aged >65 years has risen from 12 million (8%) in 1950 to 36 million (12%) in 2002. In the same period, an eightfold increase was observed in the population aged 85 years and older [1]; this population of oldest-old patients is anticipated to reach 7 million in 2020 and 14 million in 2040.

Elderly patients are frequent users of hospital, particularly critical care, services. Of the patients admitted to the intensive care units (ICUs) of 40 institutions in the United States and of 36 medical and surgical ICUs in Paris suburbs, the proportions of patients who were over age 65 were 48% and 38%, respectively [2,3]. The incidence of acute respiratory failure (ARF) increases almost exponentially with age [4]. Briefly, the incidence of ARF in the 65–84 age group is almost twice that of the 55–64 age group, and is more than three times that of younger age groups. As a consequence of such epidemiology, the topic of critical respiratory illness in the elderly is particularly appropriate.

The study by Ray and colleagues published in the previous issue of *Critical Care* was designed to precisely determine the causes of ARF in elderly patients, the accuracy of the initial diagnosis and the impact of initial treatment on the outcome [5]. This observational study took place in the Emergency Room not in the ICU, and was conducted in a global geriatric population including patients aged <70 years as well as patients aged >85 years who basically have different prognoses and raise different diagnostic and therapeutic problems.

Ray and colleagues' study is important as it presents epidemiologic data based on more than 10,000 elderly patients in the Emergency Room, including 514 patients with ARF [5]. Twenty-nine per cent of ARF patients required ICU admission during the first 24 hours; a missed diagnosis was retrospectively noted in 20% of cases. An inappropriate treatment, prescribed in 32% of patients, was associated with an increased mortality rate (25% versus 11% in patients correctly treated in the Emergency Room). The authors suggested systematically evaluating the severity of illness of such elderly patients with ARF using easy-to-obtain criteria: $PaCO_2$, creatinine clearance, the brain natriuretic peptide levels and the presence of abdominal paradoxical respiration (or the use of accessory respiratory muscles) were identified as variables independently associated with death.

Studies conducted in geriatric patients for more than 25 years are not without limitations and possible drawbacks, particularly when they evaluate the impact of advancing age on outcomes [6]. First, these studies were conducted in groups of patients with non-generally accepted definitions of patients arbitrarily called old, young-old, very old, or oldest-old patients (>65 years, >70 years, >75 years, >80 years, >85 years, >90 years). The studied patients were usually compared with totally different control groups: younger patients, or younger patients with the same disease or syndrome, or same-age patients without critical illness. A third limitation is that the procedures used during the hospital stay and/or the ICU stay were not always considered. Fourth, because of variations in culture, demographics and allocation of resource systems resulting in large variations in admission

ARF = acute respiratory failure; ICU = intensive care unit.

policy, because of preferences for life-sustaining therapies and because of decisions to withhold such therapies and do-not-resuscitate orders, the results were difficult to generalize. In addition, as for all studies conducted in populations of severely ill elderly patients, a selection bias cannot be eliminated in this study, with probably only the oldest-old patients in good condition being admitted [3].

The relatively high rate of missed diagnosis is not surprising. Twenty years ago, Bayer and colleagues identified, in a large unselected group of elderly patients, the variable presentation of acute myocardial infarction [7]. In extreme old age (>85 years), atypical symptoms become the rule and the clinician must be prepared to screen for the diagnosis in most acutely ill patients. Riquelme and colleagues similarly demonstrated that community-acquired pneumonia in the elderly has a different clinical presentation to community-acquired pneumonia in other age groups. This incomplete presentation with a concomitant delay in antimicrobial treatment may contribute to the greater mortality of community-acquired pneumonia in the elderly compared with younger patients [8].

Diseases therefore have atypical presentations in the geriatric population, and the diagnostic and therapeutic management of elderly patients should consider the multisystem involvement often present in the development of disease in such patients. We should be committed to many more clinical trials and evaluations of diagnostic and management procedures as applied in the elderly to try to define 'realistic' goals. These procedures should include adequate follow-up observation so that we can judge from the outcome what has been beneficial and what has been useless [9].

Numerous studies on the outcomes of critically ill elderly patients have been published in recent years. Briefly, three types of criteria, frequently measured at the same time in the same cohort of patients, are used to define geriatric critical care outcomes: short-term mortality (hospital mortality, ICU mortality, 30-day mortality, etc.), long-term mortality (90-day mortality, 1-year mortality, 3-year mortality, etc.) and quality of life (functional status, measures of activities, etc.). The large majority of these studies indicated that acute physiology disturbances and diagnosis had much larger relative contributions to short-term prognosis than age. After adjusting for important prognostic factors including severity of acute illness, underlying comorbidities and preadmission functional status, age was identified as accounting for less than 5% of the explanatory power for hospital mortality [10,11].

Short-term survival of patients older than 65 years, however, is significantly lower than that for younger patients. Also, in a population of critically ill elderly patients, a significant relationship exists between age and inhospital mortality. Finally, after discharge from the hospital, deaths occurred predominantly during the first 3 months [12]. Unlike the secondary importance of age on short-term mortality, age *per se* is a risk factor for long-term mortality – the risk of death increasing with the number of comorbidities, a low cognitive function and the difficulty in instrumental activity. It is worthy of notice that patients surviving 1 year after ICU admission had regained their previous health status and their further survival almost paralleled than that of the general population [13].

Although Ray and colleagues' study of ARF in the elderly is limited to the Emergency Room setting and cannot be directly extrapolated to the critical care unit, it raises a number of important questions that are very relevant to the ICU setting. Additional research in the ICU also does not support the rationing of healthcare based on chronological age. Physicians tend to overestimate the importance of age in survival from critical illness, and they underestimate the quality of life for elderly survivors. To avoid an inappropriate utilization of ICUs for the elderly, particularly the oldest-old patients (>85 years), admission policies must be better defined. To date, the data underscore the need to develop accurate risk prediction formulas: we need to identify during the early phase of their critical illness those elderly patients who may benefit from intensive care. Finally, studies evaluating long-term outcomes, including quality of life and costs, are needed so that patients, families and physicians can make decisions based on expected outcomes and patient/family wishes.

Competing interests

The author declares that they have no competing interests.

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