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Chronic critical illness: a growing legacy of successful advances in critical care

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MeSH Terms

Critical illness; Chronic disease/economics; Mechanical ventilation; Health policy; Survivors

Armed with the tools of the modern ICU, intensivists are now able to rescue and sustain the life of even the most severely ill patients. Yet the ability to support even those who are dying comes with consequences[1]. Many critically ill patients survive their immediate acute illness only to be burdened by the need for prolonged life support, protracted hospital and other healthcare facility stays, lasting physical and mental deficits, and significant healthcare expenses[2-4]. In 1985 Girard and Raffin coined the term “chronically critically ill” to describe such patients, those surviving an initial episode of critical illness but left dependent on intensive care therapies for prolonged periods[5]. As the population ages, and advances in critical care continue to improve survival among the most severely ill patients, many assert that the incidence of chronic critical illness (CCI) will continue to rise[6].

In this issue of *Critical Care Medicine*, Kahn et al. provide new evidence supporting these assertions[7]. The authors examined hospital discharge records from several geographically diverse states between 2004-2009 to identify the population-base incidence rates of CCI, and to characterize the outcomes, costs, and discharge location of patients with CCI over time. The authors defined CCI as an ICU length of stay of eight days and the presence of any one of several conditions, including prolonged acute mechanical ventilation, tracheotomy, sepsis, ischemic stroke, intercerebral hemorrhage, or traumatic brain injury. The authors identified a steadily increasing incidence of CCI across age groups, peaking at 82 / 100,000 in 75-79 year-olds. Hospital mortality for the group was 31%, and 67% of survivors were discharged to long-term acute care hospitals (LTACH), skilled nursing facilities, or other acute care hospitals. Most importantly, the authors also determined that the incidence of CCI was not only high, but also increased every year of the study.

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These statistics are a sobering reminder that our ability to save lives in the ICU increasingly comes with dramatic consequences. The study underscores the pressing need to develop interventions that prevent the development of this devastating condition. It also highlights the importance of effectively counseling families in the ICU about CCI. When families are faced with difficult decisions about continuing life support therapies, this data may help them to place their loved one's values and preferences in the context of the care being provided. As the authors note, this is likely already occurring among the very old as evidenced by their lower incidence of CCI, but greater risk of death. Investigators are already testing promising interventions that incorporate prognostic information to support family decision-making in CCI (e.g. ClinicalTrials.gov number, NCT01230099).

Before we accept the work of Kahn et al as the definitive examination of the epidemiology and outcomes of CCI, however, we should also consider its limitations. A important distinction between this study and previous studies of patients with CCI is the definition the authors used. Instead of using the duration of mechanical ventilation to identify patients with CCI (e.g. 14 or 21 days), they adopted a definition recently commissioned by the Center for Medicare and Medicaid Services (CMS). This definition was developed to identify critically ill patients with high resource use, high Medicare payments, high LTACH transfer rates, and payments that differ markedly by site of care (i.e. acute care hospital vs. LTACH) to potentially target them for payment reform[8]. In other words, the definition was crafted around a need to develop new payment policies for these expensive patients, and not simply for clinical practice. The authors cite policy relevance as well as the ability to use this definition in administrative data as its primary strengths.

The lack of a uniformly accepted definition of CCI is frequently cited among factors hindering research of this syndrome[9]. Thus one could also view the study by Kahn and colleagues as potentially exacerbating this problem. The scientific community could tolerate a new definition for CCI if it improved upon existing ones, but at least two primary flaws in this new definition will ultimately impede its adoption. First, the inclusion of ICU length of stay in the definition for CCI guarantees that the population identified is highly dependent on factors unrelated to the constellation of features clinically defining the syndrome. This is because ICU length of stay is not only determined by an individual's severity of illness, but is also a function of the availability of ICU, intermediate care, and hospital beds, and the specific case-mix of the hospital [10, 11]. Second, the policy relevance of this definition was also recently drawn into question when CMS opted to enact payment reforms for CCI patients defined as those with ICU stays of more than 3 days, not the 8 days plus a qualifying condition used in the Kahn analysis[12]. Despite these flaws, prolonged acute mechanical, which is the hallmark of CCI in virtually all definitions, was the qualifying diagnosis for 72% of patients in the current study. This is reassuring as it suggests the incidence statistics provided by Kahn et al. reasonably approximates the true burden of CCI.

Defining chronic critical illness is challenging because there is a gradual evolution between acute and CCI with no obvious transition point [13], so all definitions of CCI are inherently imperfect. Years of research evaluating different CCI definitions suggest that none will satisfy the all the needs of clinicians, scientists, and policymakers and each definition brings

tradeoffs. Given the increasing burden of CCI, it is time to move the conversation beyond how we define CCI and focus on reducing and ameliorating this legacy of our success.

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