Self-Reported Symptoms of Depression and Memory Dysfunction in Survivors of ARDS*

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Background: **Survivors of ARDS have well documented physical limitations, but psychological effects are less clear. We determined the prevalence of self-reported depression and memory dysfunction in ARDS survivors.**

Methods: **Six to 48 (median 22) months after ICU discharge, we administered instruments assessing depression symptoms (Beck Depression Inventory-II [BDI-II]) and memory dysfunction (Memory Assessment Clinics Self-Rating Scale [MAC-S]) to 82 ARDS patients who were enrolled in a prospective cohort study in four university-affiliated ICUs.**

Results: **Sixty-one (74%), 64 (78%), and 61 (74%) patients fully completed the BDI-II, MAC-S (Ability subscale), and MAC-S (Frequency of Occurrence subscale) instruments. Responders (similar to nonresponders) were young (median 42 years, interquartile range [IQR] 35 to 56), with high admission illness severity and organ dysfunction. The median BDI-II score was 12 (IQR 5 to 25). Twenty-five (41%) patients reported moderate-severe depression symptoms and were less likely to return to work than those with minimal-mild symptoms (8/25 [32%] vs 25/36 [69%]; $p = 0.005$). Median MAC-S (Ability) and MAC-S (Frequency of Occurrence) scores were 76 (IQR 61 to 93) and 91 (IQR 77 to 102), respectively; 8%, 16%, and 20% scored > 2, > 1.5, and > 1 SD(s), respectively, below age-adjusted population norms for each subscale. BDI-II and MAC-S scores were negatively correlated (Spearman coefficient −0.58 and −0.50 for Ability and Frequency of Occurrence subscales, respectively; $p < 0.0001$). Univariable analyses showed no demographic or illness-severity predictors of BDI-II (including the Cognitive subscale) or MAC-S (both subscales); results were similar when restricted to patients whose primary language was English.**

Conclusions: **ARDS survivors report a high prevalence of depression symptoms and a lower prevalence of memory dysfunction 6 to 48 months after ICU discharge. Depression symptoms may hinder the return to work, or patients may report these symptoms because of inability to re-enter the workforce.** ***(CHEST 2009; 135:678–687)***

Key words: cross-sectional; depression; memory disorders; outcomes survey; respiratory distress syndrome, adult

Abbreviations: APACHE = acute physiology and chronic health evaluation; BDI-II = Beck Depression Inventory-II; CI = confidence interval; IQR = interquartile range; LIS = lung injury score; MAC-S = Memory Assessment Clinics Self-Rating Scale; MODS = multiple organ dysfunction score; OR = odds ratio

Patients with acute lung injury have acute hypoxemic respiratory failure with bilateral pulmonary infiltrates not due to left atrial hypertension.[1] This disorder, including the more hypoxemic subgroup of ARDS, is associated with pulmonary and nonpulmonary risk factors and has an estimated incidence of nearly 200,000 cases/year in the United States,[2] with a case-fatality rate of 25% to 50%.[3–8] Given the large number of patients with acute lung injury surviving their ICU and hospital stay, interest in long-term outcomes is growing. Current evidence suggests that survivors have persistent generalized weakness[9] and reduced quality of life[9–13] compared to age-matched population controls, but relatively preserved pulmo-

nary function.[9,11,14,15] Long-term outcomes include significant cognitive impairment and emotional distress,[11,16] but the prevalence of these findings, their pathophysiology, and their functional consequences remain unclear.

We followed ARDS survivors enrolled in a 5-year prospective cohort study after hospital discharge[9] and observed that some patients reported symptoms of depression and memory loss; others were unable to return to work. In light of these accruing observations, we decided to more formally evaluate the prevalence of depression symptoms and self-reported memory deficits in ARDS survivors and to determine the relationship between depression symptoms and return to work. We have previously reported some results in abstract form.[17]

Materials and Methods

Patients

The patients in this study had participated in a previously reported prospective cohort study of ARDS survivors enrolled from ICUs at four University of Toronto teaching hospital, between May 1998 and May 2001.[9,11,18] Eligible patients were at least 16 years old and had a PaO_2/inspired fraction of oxygen ratio of 200 or less while receiving mechanical ventilation with a positive end-expiratory pressure of at least 5 cm H_2O, airspace changes in all four quadrants on chest radiography, and an identifiable risk factor for ARDS. Patients were excluded if they were immobile prior to ICU admission, had a history of lung resection, or had a neurologic disease or psychiatric disorder documented in their chart. We obtained informed consent for questionnaire completion. The University Health Network Research Ethics Board approved this study.

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Survey Administration and Outcomes

We mailed patients a questionnaire containing two self-administered instruments: the Beck Depression Inventory II (BDI-II)[19] and Memory Assessment Clinics Self-Rating Scale (MAC-S).[20–22] We followed up nonresponders with two telephone calls. Study personnel or family members helped administer the instruments for those who needed assistance (*eg*, translation for non-English readers), according to patient preference. Patients returned the questionnaires in person at a follow-up visit or by mail. Because we designed this study while follow-up of patients enrolled in the prospective cohort was underway, questionnaires were administered over a broad range of times after ICU discharge.

The BDI-II instrument consists of 21 questions and screens for depression using criteria consistent with the Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition. Higher scores (range, 0 to 63) indicate more depression symptoms. This scale consists of two subscales measuring cognitive (9 items) and somatic-affective (12 items) symptoms,[19] a factor structure which has been validated in medical patients.[23,24] Based on testing in psychiatric outpatients, depression symptom severity is classified as minimal (score 0 to 13), mild (14 to 19), moderate (20 to 28), and severe (29 to 63).[19] Psychometric properties of the BDI-II instrument include high internal consistency, high content validity, validity in differentiating between depressed and nondepressed persons, and sensitivity to change.[25]

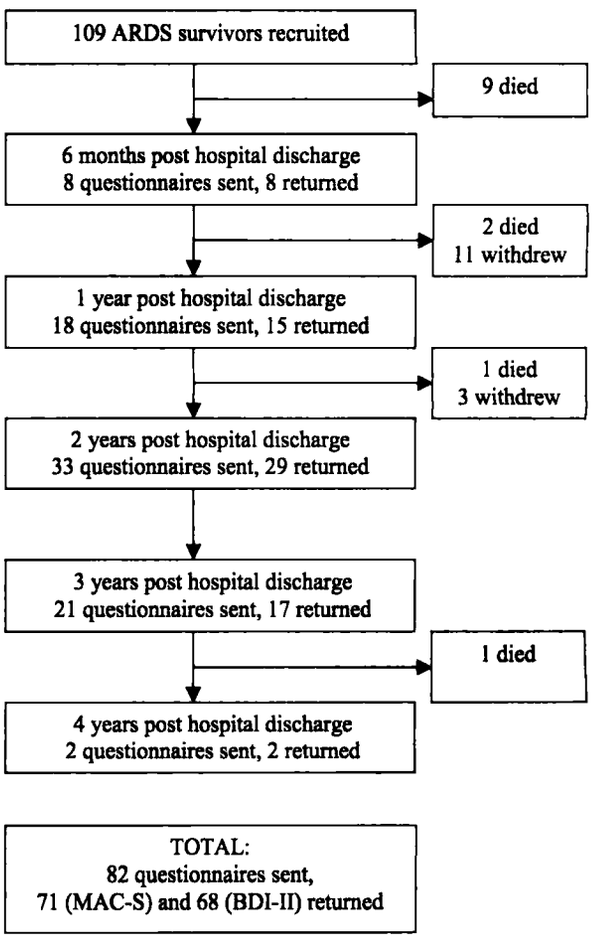

Figure 1. Flow through the study.

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