Cognitive Dysfunction in Older Adults Hospitalized for Acute Heart Failure

CYNTHIA ARSLANIAN-ENGOREN, PhD, RN, ACNS-BC, FAHA, FAAN,[1] BRUNO J. GIORDANI, PhD,[2] DONNA ALGASE, PhD, RN, FGSA, F-NGNA, FAAN,[1] AMANDA SCHUH, MS, RN, PMHNP-BC,[1] CORINNE LEE, DNP, RN,[3] AND DEBRA K. MOSER, DNSc, RN, FAHA, FAAN[4]

Ann Arbor, Michigan; and Lexington, Kentucky

ABSTRACT

Background: Few studies have measured cognitive dysfunction in older adults during acute exacerbations of heart failure (HF), even though 25% of patients are readmitted within 30 days. The aims of this study were to examine cognitive dysfunction and acute HF symptoms in older adults hospitalized for HF and to evaluate the relationship between cognitive dysfunction and 30-day rehospitalization rates for acute HF.

Methods and Results: A cross-sectional descriptive design was used to characterize cognitive function in 53 older adults hospitalized for acute HF with the use of Cogstate computerized neuropsychologic tests. Demographic characteristics, HF symptoms (dyspnea, fatigue, pain, and depressed mood), comorbidity, and 30-day readmission HF rates were also measured. Dyspnea was measured with the use of the Parshall Brief Clinical Dyspnea Rating Questionnaire while fatigue was measured with the use of the Chalder et al Brief Fatigue Scale. We measured pain with the use of the Short-Form McGill Pain Questionnaire and depressed mood with the use of the depression subscale of the Hospital Anxiety and Depression Scale. Comorbid conditions were measured with the use of the Charlson comorbidity index. With the use of linear regression, dyspnea ($\beta = -.281$; $P = .030$), pain ($\beta = .323$; $P = .011$), and depressed mood ($\beta = .406$, $P = .003$) were associated with reduced attention and working memory speed, and pain ($\beta = -.372$; $P = .005$) and fatigue ($\beta = -.275$; $P = .033$) were associated with reduced accuracy of attention and working memory. Ten patients were readmitted within 30 days for HF. According to Mann-Whitney *U* analysis, cognitive dysfunction measures ($P = .090-.803$) failed to show differences in HF readmission.

Conclusions: Participants with more and worse symptoms had decreased speed and decreased accuracy in the cognitive domains tested. Cognitive dysfunction measures did not differentiate participants who were readmitted versus those who were not readmitted within 30 days for acute HF. (*J Cardiac Fail 2014;20:669–678*)

Key Words: Cognition, heart failure, hospital readmission, symptoms.

Approximately 25%–50% of heart failure (HF) patients experience cognitive dysfunction[1] in basic (attention and memory)[2] and higher-order domains (decision making and executive function).[3] Although cognitive dysfunction as a common sequela of chronic stable HF has been studied,[1,4–8] few investigators have measured cognitive dysfunction sequelae during acute exacerbations of HF and its effects on 30-day readmission rates even though ~25% of HF

From the [1]University of Michigan School of Nursing, Ann Arbor, Michigan; [2]University of Michigan, Ambulatory Psychiatry, Ann Arbor, Michigan; [3]Professional Development and Education University of Michigan Health Systems, Ann Arbor, Michigan and [4]University of Kentucky College of Nursing, Lexington, Kentucky.

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Reprint requests: Cynthia Arslanian-Engoren, PhD, RN, ACNS-BC, FAHA, FAAN, University of Michigan School of Nursing, 400 North Ingalls, Room 2176, Ann Arbor, Michigan 48109. Tel: + 734-647-0182; Fax: + 734-935-5525. E-mail: cmae@med.umich.edu

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patients are readmitted within 30 days of HF hospitalizations.[9] The little evidence available suggests that cognitive dysfunction noted during periods of acute HF and hospitalization is associated with increased mortality for older adults[10] and previously unrecognized cognitive dysfunction.[11]

Cognitive dysfunction is common in hospitalized elders; 35%−45% of older adults had cognitive dysfunction as measured by Mini-Mental Status Examination (MMSE),[10,11] and 24% of those cognitively impaired older adults also had HF.[11] In addition, 18% of patients with cognitive dysfunction had delirium based on the Confusion Assessment Method diagnostic algorithm.[11] Yet only 35% of hospital staff recognize symptoms of cognitive dysfunction during acute illness of older adults, underscoring the need for better recognition, assessment, and management of cognitive dysfunction.[11]

The acute phase of HF, which often requires hospitalization for medical management, is associated with new or worsening symptoms of HF, including dyspnea, fatigue, depression, and pain.[12] Acute HF and its associated hospital admission is a time of important health care decision making and extensive patient education for symptom management.[13−15] These common symptoms (dyspnea, fatigue, depression, and pain) may impair the ability of HF patients to direct their attention, remember new information, and engage in self-care management decisions. A better understanding of these HF symptoms and their relationship to cognitive dysfunction is important not only because they may lead to poor learning and self-care performance, but also because they may add to the burden of illness during the acute phase and persist as an added disability in the long term. Indeed, 26% of HF patients are discharged to extended care facilities,[16] and 21% of adults aged ≥65 years are discharged to long-term care institutions,[17] which may represent, in part, the inability to engage in self-care activities. It is estimated that 50% of HF hospitalizations are preventable[18−21] and are most commonly caused by poor self-care,[22,23] the inability to maintain health and manage illness and disease using positive health practices.[24] Therefore, the primary purpose of the present study was to examine cognitive dysfunction and acute HF symptoms in adults aged ≥65 years who were hospitalized for HF and secondarily to determine if cognitive dysfunction was associated with hospital readmission. More specifically, we aimed to characterize in-hospital cognitive dysfunction (specifically attention and memory) and common HF symptoms (dyspnea, fatigue, depression, and pain) during the acute phase of HF, evaluate the relationship among cognitive dysfunction and common HF symptoms and evaluate the relationship between cognitive dysfunction and 30-day rehospitalization rates for acute HF.

Methods

The University of Michigan Institutional Review Board Committee approved this study, and written informed consent was obtained from each subject. A cross-sectional descriptive design was used to characterize cognitive dysfunction in older adults hospitalized for acute HF and to evaluate the relationship between acute HF symptoms and cognitive dysfunction. Participants were recruited from a university-affiliated medical center. Data were collected within 48 hours of admission 3 days per week (Monday, Wednesday, and Friday) between the hours of 12:00 and 16:00 to minimize effects of fatigue from morning care, diagnostic tests, or procedures on the assessment of cognitive function. We strove to test at the same time each day, within a 2-hour window, for consistency in procedures with the use of established questionnaires[25−33] and Cogstate computerized neuropsychologic tests.[34]

The inclusion criteria included patients who were ≥65 years old, hospitalized for acute HF (New York Heart Association functional class IV), able to understand and read English, and had visual ability, normal hearing at a conversational tone, and the physical ability to use a computer keyboard. Excluded were acute HF patients who were prisoners, unable to provide verbal responses or describe their acute HF experience, currently being treated in the intensive care unit, or had a current medical diagnosis of psychosis, terminal cancer, dementia, or encephalopathy.

Research assistants (RAs) were hired and trained in all data collection−related procedures (recruitment, consent, minimization of environmental distractions, cognitive testing, and extracting chart review data) and completed the University of Michigan Program for Education and Evaluation in Responsible Research and Scholarship. A joint chart review session was conducted by the lead author with each RA to demonstrate interrater reliability with the use of 10 charts and trained to 100% agreement. A random 10% of charts were reviewed to ensure project-related data collection procedures and to assess completeness of collected data.

Procedures

We contacted the Clinical Nurse Specialist (CNS) or senior staff nurse on the inpatient acute HF units to identify potential participants. These nurses screened patients with the use of the daily census, study inclusion/exclusion criteria, and patient interest in participation. Screeners briefly explained the study purpose and asked potential participants about their interest and willingness to be approached by the study team. Those who agreed had their names and contact information telephoned to the lead author. Before entering patient rooms, we confirmed with staff nurses that it was a good time to approach the patient. We then described the study to potential participants, verified their eligibility, and addressed all study-related questions. Once eligibility was determined, each participant completed an MMSE as a screening for cognitive function. All participants scored ≥21 on the MMSE and were therefore able to provide their own written informed consent to participate.

After written consent was obtained, face-to-face structured interviews were conducted in patient rooms without visual or auditory distractions. To minimize distractions, a do-not-disturb sign was posted on the outside of the patient's door indicating testing was in progress. Demographic information was obtained with the use of an instrument developed by the lead author, and other data were collected with the use of established questionnaires.

Measures

Cognitive function was measured with the use of neuropsychologic tests from the Cogstate[34] battery in the domains of attention and memory. Cogstate measures are validated and reliable computerized neuropsychologic tests[34] that correlate with