Mild Cognitive Impairment, Screening, and Patient Perceptions in Heart Failure Patients

ROBYN GALLAGHER, RN, BA(Psych), MN, PhD,[1] ANNE SULLIVAN, RN, BA Admin Nurse, Coronary Care Cert,[2] RHONDA BURKE, RN, BSN, MN,[3] SUSAN HALES, RN, BN, Cert CT,[4] GERALDINE GILLIES, RN, BA, Dip Nurse Ed,[5] JAN CAMERON, RN, BN, PhD,[6] BERNARD SALIBA, BMedSc,[1] AND GEOFFREY TOFLER, MBBS[2]

Sydney, St Leonards, and Melbourne, Australia

ABSTRACT

Objective: Cognitive impairments are prevalent in heart failure (HF) patients, worsening outcomes but often undetected.The aim of this study was to screen HF outpatients for mild cognitive impairment (MCI), determine the areas of cognition affected, patient awareness of cognitive change, and associated factors.

Method and Results: HF patients (n = 128) newly registered for the Management of Cardiac Function program, free from neurocognitive disorder, and with sufficient visual acuity were assessed with the use of the Montreal Cognitive Assessment tool (MoCA). MCI was classified as MoCA score ≤22. The sample was elderly (mean, 80.65 years; SD, 11.52). Mean MoCA score was 24.58 (SD 3.45), 22% were classified as impaired, 45% had noticed a change in cognition, and 15% reported that they were affected in their daily lives. Patients noticing this impact had lower MoCA scores (22.74, SD 3.0) than those who did not (25.17, SD 2.96; $P \leq .02$). Most impairments occurred for delayed recall, visuospatial/executive function, and abstraction. The odds of impairment increased by the presence of ischemic heart disease (odds ratio, 4.18; 95% confidence interval, 1.15−15.69).

Conclusions: In HF outpatients without a dementia diagnosis, MCI is prevalent. Screening for MCI and incorporation of compensatory strategies are essential. (*J Cardiac Fail 2013;19:641−646*)

Key Words: Cognitive impairment, screening, heart failure, comorbidity, awareness.

Heart Failure (HF) is an increasingly prevalent disease, with 23 million people estimated to be effected internationally.[1] HF can affect multiple areas of everyday functioning, including cognitive capacity. Cognitive impairments limit the ability of HF patients to engage in condition-specific self-care behaviours, and in recognizing and responding appropriately to worsening HF symptoms.[2] Therefore, cognitive impairment is important to detect, manage, and ensure that compensatory mechanisms, such as additional social or community supports, are present.[3] From 25% to 50% of HF patients are estimated to have cognitive impairments,[3] and despite the association with worse patient outcomes, including mortality,[1,4] screening for cognitive impairment is not routinely undertaken in HF clinical practice. In part this is because a clinical screening measure is needed that is sensitive, specific, and feasible for use in these settings.[3−6]

A range of screening tools with varying attributes are available, the most commonly used of which are the Mini Mental State Examination,[7] Hodkinson Abbreviated Mental Test,[8] and Montreal Cognitive Assessment (MoCA).[9] One of the most desirable attributes in a screening tool is sensitivity and specificity to different levels of impairment from mild/subclinical to dementia.[10] Mild cognitive impairment (MCI) is especially important to detect in HF patients, because it is considered to be a transitional state to dementia[11] and is strongly associated with decreased self-care.[2] MCI is difficult to identify without

From the [1]Faculty of Nursing, Midwifery and Health, University of Technology, Sydney, Australia; [2]Management of Cardiac Function, Royal North Shore Hospital, St Leonards, Australia; [3]Management of Cardiac Function, Manly and Mona Vale Hospitals, Sydney, Australia; [4]Management of Cardiac Function, Ryde Hospital, Sydney, Australia; [5]Management of Cardiac Function, Hornsby Hospital, Sydney, Australia and [6]Cardiovascular Research Centre, Australian Catholic University, Melbourne, Australia.

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Reprint requests: Robyn Gallagher, RN, BA(Psych), MN, PhD, Associate Professor Chronic and Complex Care, Faculty of Health, University of Technology, Sydney, New South Wales 2007, Australia. E-mail: robyn.gallagher@uts.edu.au

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specific screening, because neither health professionals nor HF patients themselves may be aware of the subtle cognitive changes that occur, which may affect differing aspects of memory and executive functioning. Family/carers may have discreetly accommodated for these subtle cognitive changes, eg, by monitoring, recall, and reminding patients of events so that changes are less evident to all.[12] Additionally, awareness by health professionals may be limited because impairments among HF patients are heterogeneous and general intellectual function may not be impaired.[6] This means that selection should favor screening tools that assess several cognitive domains.[10,11]

In vascular MCI, which is hypothesized to occur in HF patients, memory and executive function are most affected.[13] Executive functions include problem solving and mental flexibility processes, capacities needed for the complex cognitive requirements of HF self-care management decisions and the process of engagement in self-care maintenance activities.[4] Finally, because the level of education also affects cognitive capacity, an appropriate instrument must adjust for this.[9]

Of the 3 tools listed above, the MoCA has all of these attributes plus the additional benefits of proven sensitivity and sensitivity to MCI screening in aging populations[14] and HF patients.[5,15] Using the MoCA as a screening tool with a cut-point of 26 points to classify MCI in HF patients, the prevalence is reported to be as high as 72% among outpatients (>50 years old)[16] and 75% among hospitalized patients.[2] In general[17] and cardiovascular populations,[18] the impact of age has been identified when determining normative data for MoCA scores, with incremental decreases in threshold scores for each decile in age from 35 to 80 years.[17] Other factors previously reported to affect the detection of MCI in HF patients include depression,[16] the presence of comorbidities,[18] hypertension (systolic blood pressure >130 mm Hg),[18] and HF severity,[14] so these factors should be considered when interpreting cognitive screening results.

However, an important but often neglected factor to consider when interpreting cognitive screening results is the HF patient's own perceptions of their cognitive functioning. HF patients can provide us with information which is uniquely accessible to themselves, including whether they have detected a change in cognition[19] and whether these changes have significantly affected their daily lives.[12] These insights are particularly important for clinicians in planning compensatory mechanisms for self-care and safety[1] and individual approaches to the patient's care plan, yet these issues have previously not been reported among this population. Therefore, the present study set out to identify areas of cognitive impairment in HF outpatients who have a positive MCI screening, to determine if there is an association between a patient's awareness of cognitive changes, MoCA score, and the factors associated with a positive MCI screening.

Methods

Study Design and Sample

The study used a cross-sectional descriptive design and was set in the HF service of a local Australian health district, which incorporates several hospitals in the Sydney metropolitan area. Participants were patients that, following a HF admission, were newly registered with the Management of Cardiac Function HF nurse specialist home visit program. Patients registered with this program have a diagnosis of HF, are community dwelling, must be able to understand and respond to written and spoken English sufficiently for home visiting purposes, have no diagnosed major neurocognitive or psychiatric disorder, and not require end of life care. In addition to these requirements and for the purpose of the present study, patients were excluded from participation if they had any further disorder known to influence cognition, such as a diagnosis of dementia or a major psychiatric condition, or conditions that could limit their ability to complete the MoCA, including neuromuscular dysfunction, hemiplegia, and insufficient vision or hearing. The investigation conformed to the principles outlined in the Declaration of Helsinki. Approval for the study was obtained from the Health Service (approval no. 1102-053M) and University (approval no. 2011-186R) Human Research Ethics Committees.

Patients were screened for suitability for the study during hospital admission by the HF specialist nurses; in consultation with the ward nursing staff, eligible patients were approached and informed of the study. Once consent was obtained, sociodemographic and clinical information were collected from the medical record. Data were extracted from both medical records and the patients themselves on several variables to characterize the sample and to use as covariates in the analyses. These included the participant's age, sex, marital and employment statuses, education level, living arrangements, comorbid conditions, whether the person lived alone or with other people and New York Heart Association (NYHA) functional class. During the first routine home visit by the HF specialist nurse, consent was confirmed, clinical details checked, and the MoCA and all other measures administered. Two training sessions on the use of the MoCA for the 4 HF specialist nurses were conducted followed by a pilot of 12 HF patients to ensure a standardized approach to the assessment. The MoCA took 10−15 minutes to complete. Data collection took place from April to October 2011. Sample size needed was estimated to be 128, based on an attrition rate of 8%−10% due to loss of interest or being unwell between recruitment and data collection at the first home visit (usually 1−2 weeks) and the logistic regression analysis used to identify the independent factors associated with screening positive for cognitive impairment. Ten variables were entered into this analysis, and the calculation was based on an effect size of 0.15, alpha level of 0.05, and power of 0.8.[20]

Measurements

Cognitive Impairment

The MoCA was used to assess cognitive impairment.[9] This tool is a brief (10-minute) screening tool specifically designed to detect MCI. It is made up of 8 subscales that assess visuospatial/executive function (5 points), naming (3 points), attention (6 points), language (3 points),