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ORIGINAL ARTICLE

Frailty in Acute Cardiology: Comparison of a Quick Clinical Assessment Against a Validated Frailty Assessment Tool

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Background Increasingly frail patients are being to be referred for invasive cardiac interventions and cardiac surgery. We aimed to evaluate the utility of a quick clinical assessment of frailty against a validated frailty assessment tool in an acute cardiology setting.

Methods Forty-seven cardiology in-patients ≥70 years were recruited in this prospective study. All patients were first assessed by a senior cardiology registrar as either not-frail or frail. This was based on general observation and brief discussions. Following this, patients were administered the Reported Edmonton Frail Scale (REFS) questionnaire. After a registrar assessment, the foot-of-the bed frailty assessment was independently repeated by one or two consultant cardiologists.

Results None of the three clinicians showed satisfactory similarity to the REFS score. When the two consultants were compared with the registrar, and with each other, the Cohen's kappa was only above 0.7 for the comparison between Consultant 1 and the registrar. Consultant 1 and the registrar were also significantly more likely to disagree at higher REFS score with a mean REFS score of 8.8.

Conclusion A quick foot-of-the-bed clinical assessment is not a reliable way to determine frailty.

Keywords Frailty assessment • Reported Edmonton Frail Scale • Cardiac intervention • Cardiac surgery • Acute care

Introduction

The assessment of frailty is increasingly topical in both cardiac surgery and cardiology. Frail patients are more vulnerable to the stresses of acute illnesses and are at increased risk of surgical complications, recurrent hospital admissions, eventual institutionalisation and death [1–5]. Increasingly frail patients are presenting to be referred for invasive cardiac interventions and cardiac surgery. It is therefore important to identify frail patients who are unlikely to benefit from such procedures or whom may in fact come to harm.

There is no gold standard in the assessment of frailty [6–10]. In an acute setting where a comprehensive assessment by a geriatrician is seldom practical, patient's frailty assessment is often done at the foot-of the bed based on visual appearance and a quick clinical judgment [9,10]. Various frailty assessment tools have been developed to make frailty assessment more objective and to make the decision-making more transparent. Most of these are also time consuming and have not been formally assessed in the acute cardiology setting. Many frailty assessment tools assess around 30-70 domains of frailty and these tools are usually poorly understood by non-geriatricians [9,11,12].

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Simplified tools have been developed for use in settings such as acute care clinical practice [13,14]. One such tool is the Edmonton Frail Scale [14]. This scale uses 11 items to assess physical and psychosocial features of frailty and incorporates some performance measures. It has been validated against a geriatrician's comprehensive assessment, the Geriatric Clinical Impression of Frailty (GCIF). In an acute care setting, however, performance based measures may be confounded by performance limitation related to the acute illness. The Reported Edmonton Frail Scale (REFS) which was adapted from the Edmonton Frail Scale, uses participants' self-reported function overcoming the limitations of performance assessment [13]. It is a scale that can be readily completed in a few minutes by staff without specific geriatric training. The REFS has been performed by non-geriatrician researchers and has been cross-validated against the GCIF in an Australian acute care hospital and was found to correlate moderately well (R=0.61) with the GCIF with an excellent inter-rater reliability (kappa=0.83) [13].

The aim of this study was to evaluate the utility of a quick clinical assessment against this validated frailty assessment tool to determine if an elderly patient is frail or not. We hypothesised that a traditional foot-of-the-bed frailty assessment is closely related to a frailty assessment tool with little inter-observer variability.

The secondary aim of this study was to evaluate the frailty status of elderly patients who have been offered coronary intervention or cardiac surgery at the Christchurch Hospital. We hypothesised that based on current practice, patients who are offered either coronary intervention or cardiac surgery were more likely to be non-frail.

Methods

This prospective study was conducted in Christchurch Hospital. Ethical approval for the study was obtained from the Health and Disabilities Ethics Committees (HDEC). We recruited cardiology in-patients 70 years or older. Patients admitted for elective procedures were excluded. Patients who met inclusion criteria were identified using the hospital electronic database and were approached. Patients who declined consent or who were unable to provide consent were not assessed.

Patients were first assessed by a Senior Cardiology Registrar. The registrar was blinded to their past medical history, investigation results, current diagnosis and treatment. After obtaining verbal consent, an initial foot-of-the-bed frailty assessment was made by the Registrar. Patients were assessed as either not-frail or frail. The assessment was made based on general observation and brief discussions with the patients. This process took only a few minutes with the intention that this mimicked a typical foot-of- the-bed assessment made on ward rounds.

After the initial assessment, a structured interview was undertaken to obtain baseline demographics which included age, gender, ethnicity, living circumstances and mobility status. Following this, patients were administered the REFS questionnaire (Table 1). After the Registrar assessment and REFS scoring, the foot-of-the-bed frailty assessment was independently repeated by one or two Consultant Cardiologists who would spend no more than five minutes at the patient's bedside.

Secondary Study

A separate observational study was conducted to assess frailty status as determined by REFS in 15 cardiology in-patients and 15 cardiothoracic in-patients $\geq$ 70yrs who would have undergone invasive coronary intervention and cardiac surgery respectively. Patients who met the criteria were approached by the Senior Cardiology Registrar and after obtaining consent were assessed using the REFS questionnaire.

Statistical Analysis

The REFS classifies patients with a score of 0-5 as non-frail, 6-7 as vulnerable and 8-18 as frail. However, for the purpose of this study, a REFS score of 0-7 was classified as non-frail and 8-18 as frail. Comparison between non-frail and frail groups were carried out using the Wilcoxon Rank Sum test for non-parametric continuous variable and the Fisher's exact test for categorical variables with small cell sizes. Cohen Kappa was used to assess REFS-observer and inter-observer variability.

Results

Due to the acute nature of cardiology inpatient care 50 patients were approached for consent during a study period of 45 days. Three patients declined to participate. Patient demographics of the 47 cardiology inpatients we studied are shown in Table 2.

Based on their REFS, patients were divided into non-frail (0-7) and frail (8-18). Participants' baseline characteristics, are shown in Table 3. There were no differences between the two groups in terms of age, gender, and living circumstances. However, the use of mobility aids significantly correlated with frailty. Patients needing walking frames being more likely to be classified as frail and those independently mobile as non-frail ($p<0.05$).

REFS-observer and Inter-observer Agreement

Table 4 compares the REFS with the foot-of-the bed frailty status as determined by the three clinicians. A Cohen's kappa of greater than 0.70 is generally considered to represent satisfactory similarity between indices. None of the three clinicians showed satisfactory similarity to the REFS score. When the two Consultants were compared with the Registrar and when the two Consultants were compared with each other, the Cohen's kappa was only above 0.7 for the comparison between Consultant 1 and the Registrar. When this association was looked at more closely, Consultant 1 and