

# Prevalence of frailty and its association with the composite outcome of mortality at 90-day and readmission at 30-day in older surgical patients

HS TAY<sup>1</sup>, B CARTER<sup>2</sup>, J HEWITT<sup>2</sup>, L PEARCE<sup>3</sup>, SJ MOUG<sup>4</sup>, K MCCARTHY<sup>5</sup>, MJ STECHMAN<sup>6</sup>, PK MYINT<sup>1,7</sup>

<sup>1</sup>NHS Grampian, Aberdeen, <sup>2</sup>Cardiff University, Cardiff, <sup>3</sup>Manchester Royal Infirmary, Manchester, <sup>4</sup>Royal Alexandra Hospital, Paisley, <sup>5</sup>North Bristol NHS Trust, Bristol, <sup>6</sup>University Hospital of Wales, Cardiff, <sup>7</sup>University of Aberdeen, Aberdeen

## Introduction:

With the current demographic trends, there will be rising number of older people presenting with acute surgical problems. While older age is associated with increased surgical mortality, the extent to which associated frailty has impact on mortality and other important outcome of readmission is less well researched. Therefore, we set out to assess if frailty predicts these outcomes of older patients presenting to hospital with surgical emergencies.

## Methods:

We examined the risk for mortality at 90 days or readmission at 30 days with factors of: frailty; length of hospitalisation; readmissions; polypharmacy and other potential confounders in older acute general surgical population using Older Persons Surgical Outcomes Collaboration (OPSOC) data. The five participating sites were Aberdeen, Bristol, Cardiff, Glasgow and Manchester. The cohort is comprised of all consecutive patients, ≥65 years old, who presented to the acute general surgical unit of each study site throughout May and June 2013 and 2014.

The frailty was measured using the validated 7-point Canadian study of health and ageing clinical frailty score (Box 1) and categorised into three groups; very fit, (1-2); frail (3-4); and very frail (5-7). Baseline demographic data, albumin (≤35 g/L classified as low), and the number of current medications (grouped into less than or greater than and equal to 5) of the participants were assessed. Multivariable logistic regression fitting a parsimonious forward stepping approach of nested models using a likelihood ratio test (p<0.05) was performed.

## Results:

The 742 recruited patients had a mean age of 77.2 years (SD=8.2 years), 54% (401/742) were female. Prevalence of frailty was 31.4% (233) not frail, 39.8% (295) frail, and 28.8% (214) very frail in this unselected sample of surgical emergency admissions during the study periods. Only frailty, site and abnormal albumin included in the regression were predictive of mortality and/or readmission (MR). Compared to those not frail, those that were frail and very frail had increased odds of MR of 2.1 (95% CI 1.3-3.3; P=0.001) and 3.3 (95% CI 2.2-4.9; P<0.0001), respectively. Abnormal albumin increased the odds of MR of 56% (95% CI 1.1-2.3; P=0.019).

## Discussions:

### Strengths:

This is a multicentre study conducted in different UK regions thus increases the generalizability of the results. To our knowledge, we are the first group to report the relationship between frailty and 90 days mortality and 30 day readmissions in older emergency surgical patients. We used validated and well known frailty score.

## Limitations:

There may be potential bias due to interobserver variability. Although all observers were trained in using the CSHA scale, we were not able to assess inter-rater variability.

## Implication of the research finding:

As frailty is associated with worse outcomes among older surgical patients, identifying the frail older people and provision of comprehensive geriatric assessment may have central role in optimising the care and outcomes of frail older people in acute surgical setting.

### Box 1: The CSHA Clinical Frailty Scale

1. *Very fit* - robust, active, energetic, well motivated and fit; these people commonly exercise regularly and are in the most fit group for their age
2. *Well* - without active disease, but less fit than people in category 1
3. *Well, with treated comorbid disease* - disease symptoms are well controlled compared with those in category 4
4. *Apparently vulnerable* - although not frankly dependent, these people commonly complain of being 'slowed up' or have disease symptoms
5. *Mildly frail* - with limited dependence on others for instrumental activities of daily living
6. *Moderately frail* - help is needed with both instrumental and non-instrumental activities of daily living
7. *Severely frail* - completely dependent on others for the activities of daily living, or terminally ill

Note CSHA - Canadian Study of Health and Ageing.

## Conclusions:

Approximately two thirds of acute surgical admissions are frail older people in the UK setting. There appear to be a clear dose response relationship between frailty, albumin and mortality and readmission in this population.

