

The association between frailty and outcomes after acute kidney injury: a cohort study in UK routine care

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Introduction:

The evidence for association between frailty and outcomes following acute kidney injury (AKI) is limited. An improved understanding of how pre-admission frailty is related to long-term outcomes may guide clinical practice, for example understanding length of survival could inform decisions about initiation of renal replacement therapy.

The electronic frailty index (eFI) has been developed from information routinely recorded in United Kingdom primary care health records for use in adults from the general population aged 65-95 years. The eFI can categorise individuals as fit, mildly frail, moderately frail, or severely frail. These categories are validated and accurately predict outcomes such as mortality and hospitalisation.

We aimed to investigate the association between pre-admission eFI category and outcomes for people who had been discharged from hospital following AKI.

Methods:

Using the Clinical Practice Research Datalink linked to Hospital Episode Statistics, we identified adults admitted to hospital with their first recorded episode of AKI between January 2010 to December 2016, and who survived to discharge. This analysis was limited to those prescribed ACE-inhibitor/angiotensin receptor blocker in the 60 days preceding admission: further analysis in the whole population is ongoing. We determined each participant's baseline eFI and eFI category using the sum of 36 defined frailty deficits from each patient record. We estimated hazard ratios (HR) for death (primary analysis) and subsequent readmission with AKI or heart failure, using multivariable Cox regression, comparing moderate/severe frailty to fit/mild frailty. We undertook stratified analyses within pre-specified subgroups.

Results:

We included 18,747 people whose baseline characteristics by frailty group are shown in Table 1. The association between frailty category and death, or readmission with AKI or heart failure, is shown in Figure 1. After adjustment for age, sex, ischaemic heart disease, hypertension, diabetes, heart failure, baseline eGFR and year of discharge, moderate/severe frailty before admission was associated with increased risk of mortality compared to fit/mild frailty (HR 1.16; 95% CI 1.09-1.23); this was not altered by additional adjustment for initiation of renal replacement therapy as a potential mediator. In fully adjusted models, eFI was also associated with risk of readmission with AKI (HR 1.40; 95% CI 1.28–1.54) and readmission with heart failure (HR 1.43; 95% CI 1.28–1.60).

In stratified analyses, the association between baseline eFI category and death was notably not demonstrated in women (compared to men), among those aged over 90 years (compared to younger age

groups), among those with pre-admission heart failure (compared to none), or for those with baseline eGFR <45 mls/min/1.73m² (compared to better kidney function).

Conclusion:

Moderate/severe frailty, assessed by objective pre-admission characteristics, was associated with greater risk of death and other adverse events after AKI, beyond known comorbidities. The eFI can provide valuable information that may aid discussion with patients about prognosis and future care wishes. However, the lack of association in specific groups suggest that it is of limited use to guide decision-making in its current form.