Validation of the Study of Osteoporotic Fractures (SOF) Frailty Index as Predictor of Long-term Mortality in Ambulatory Older Men

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BACKGROUND & AIM

Frailty is characterized by a physiologic decrease of reserve capacity and resistance to stressors. So far, no consensus has been reached on an operational definition for frailty. A definition with criteria that do not rely on distribution-based cut-off points seems appealing for implementation in clinical practice, since the establishment of a reference population is not required.

In 2008, the Study of Osteoporotic Fractures (SOF) Research Group developed a straightforward index to identify frailty. However, previous studies found inconsistent associations with mortality depending on ethnicity and setting of the population examined.

In this study, we aimed to evaluate the SOF frailty index for prediction of all-cause mortality in a well-described sample of apparently healthy community-dwelling older men in Belgium with long-term follow-up.

RESULTS

- Mean age of participants was 78.4 ± 3.5 years.
- Pre-frailty and frailty was present in 30 and 7% of men, respectively.
- After 15 years of follow-up, 165 men (86%) died.
- Both pre-frail and frail status was associated with higher mortality rates, independently from age (Figure 1). Multivariate forward regression, which retained number of medications in the analysis, did not alter significance of the association between frailty and mortality (age and medication number-adjusted HR=1.95, 95% CI=1.01 – 3.77).

Figure 1. Survival Curves for SOF Frailty States in Community-Dwelling Older Belgian Men (N=191) predicted from age-adjusted Cox regression models.

- After three years, the proportion of deceased men who had presented with frailty was 38.5% while the proportion of survivors who were robust was 86.8% (age-adjusted AUC was 0.675). After nine years, positive predictive value increased to 92.3%, but negative predictive value decreased to 52.9% (age-adjusted AUC was 0.674).

METHODS

- Population-based cohort study (5th wave).
- Ambulatory men aged 74-89y living in the community of Merelbeke, Belgium (N=191).
- According to the SOF index, subjects were considered to be frail if 2 or all of the following components were present, pre-frail if only one component was present, and robust if none of the components was present:
  - Weight loss (irrespective of intent to lose weight) of 5% or more between the second and fifth visit (mean time between visits 3.0±0.05 years).
  - Inability to rise from a chair five consecutive times without using the arms.
  - Poor energy as identified by a negative answer to the question "do you feel full of energy?" on the 30-item Geriatric Depression Scale.
- An age-adjusted Cox proportional hazards model and the corresponding survival curve were used to analyze the association with 15-year all-cause mortality. An additional multivariate analysis with forward selection of BMI category, low education, living alone, smoking status, number of medications, and total score on the Geriatric Depression Scale was also performed.

CONCLUSIONS

Our findings confirm the predictive value for mortality of the SOF index in older community-dwelling Belgian men. The non-distributional characteristics of the SOF criteria facilitate their application in clinical setting.