Secondary Prevention

Validation of frailty assessment batteries in relation to prognosis in older patients with cardiovascular disease

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Background: Frailty is accompanied by, or can be caused by, a combination of several physical, psychosocial and cognitive problems, and is highly prevalent in older patients with cardiovascular disease (CVD). However, different frailty assessment batteries (e.g. Fried and Vigorito) remain to be compared in terms of prognosis, as well as the subcomponents within those batteries.

Purpose: To examine which frailty measurements contribute to the prediction of frailty in CVD patients, and prognosis, and thus should be executed in clinical settings.

Methods: In 133 CVD patients (mean age 78.1 ± 6.7 years) the presence of frailty was examined by the Fried criteria and compared with the outcome from the multi-component frailty assessment tool of Vigorito including the Mini Nutritional Assessment (MNA), Katz-scale, 4.6 m gait speed, Timed Up and Go Test (TUG), handgrip strength, Mini Mental State Examination (MMSE), Geriatric Depression Scale (GDS-15) and number of medications. Additional tests were executed to further enhance the prediction of frailty. Patients were followed to register hospitalisations (general and urgent) and mortality up to 6 months after the frailty assessment. First, it was then analysed whether the Fried or Vigorito test battery would equally predict complications during follow-up, and secondly a new frailty test battery was developed with evaluation towards complication risk predictions.

Results: According to the tool of Vigorito, significantly more CVD patients suffered from minor vs. moderate frailty (34% vs. 10%, $p < 0.001$) while the Phenotype of Fried did not succeed in detecting any significant difference in the number of pre-frail vs. frail patients (26% vs. 38%, $p = 0.11$). Moreover, the largest part of the pre-frail patients of Fried seems to be not frail according to Vigorito and the frail patients of Fried seems to be mainly minor frail according to Vigorito.

Significant associations were found between hospitalisations and frailty according to Fried while mortality was significantly associated with frailty according to Vigorito and the newly developed formula ($p = 0.013$). Finally, based on the multivariate regression model ($R2 = 0.95$), sex, MNA, Katz scale, TUG, handgrip strength (dominant hand), MMSE, GDS-15, total number of medications and the interaction effect between the Katz-scale and TUG should be assessed to detect frailty. Based on these parameters, a new formula to detect frailty was developed ($r = 0.95$ with Vigorito score, $p < 0.001$).

Conclusions: In comparison with the frailty assessment tool of Vigorito, the Fried criteria may overestimate frailty and its severity. Moreover, frailty seems to be significantly associated with 6-months hospitalisations as well as with mortality. The newly developed frailty assessment battery has the potential to detect frailty in a multidimensional way, and, moreover, to predict mortality.