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Self-reported frailty among end-stage renal disease patients: A potential predictor of dialysis access outcomes

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To the Editor,

Frailty occurs in 30 to 73% of patients with end-stage renal disease (ESRD) and is an important contributor to adverse health outcomes in this population irrespective of age.[1,2] The severity of frailty correlated significantly with dialysis complications.[3] However, available reports indicate that frailty has a close relationship with vascular damage in community-dwelling older adults, while very few address the association between frailty and peripheral vascular disease (PVD).[4] None of the existing studies evaluate whether frailty is associated with a higher risk of vascular access (VA) failure. In this follow-up study, we tested the hypothesis that self-report frailty increased the risk of incident VA failure after frailty assessment in these patients.

Sixty-three ESRD patients undergoing chronic haemodialysis were screened in National Taiwan University Hospital Jinshan branch during 2014; 12 were excluded due to an expected survival of less than months, and 51 were finally enrolled during 2014 (NO.201403006RINB) with informed consent. After receiving detailed instructions and training, dedicated nurse researchers administered a self-report simple FRAIL scale (scores between 0 and 5, where 3 or higher denotes frailty) to all participants. Originally devised by the International Association of Nutrition and Aging, the simple FRAIL scale aims to screen for the presence of frailty, through 5 simple questions encompassing the entire spectrum of frail phenotype (Fatigue, Resistance, Ambulation, Illness, and Loss of weight).[5] We previously showed that screening results from simple FRAIL scale in ESRD patients exhibited strong association with patient symptomatology and multiple health-related outcomes in this population, including malnutrition, inflammation, osteoporosis, and bony fracture.[3,6,7] They were followed up until 31 August 2016 or death, whichever occurred first, with periodic VA surveillance through physical examination (thrill, pulsatility, and prominent collateral veins), intra-dialytic dynamic monitoring of venous pressure and blood flow reduction, and the duration of bleeding from puncture sites after each session. If dialysis staff noted abnormalities involving one or more indicators consecutively for three times or access thrombosis, participants received fistulography with angioplasty or thrombectomy performed according to Kidney Disease Outcomes Quality Initiative guidelines.[8]

Among the 51 participants (mean age 68 ± 11.8 years, 43% male, 3.4 ± 2.8 years of dialysis), 51% had diabetes mellitus (DM) (51%), and 68.6%/31.4% used arteriovenous fistula/graft, respectively. 19.6% were found to be frail (mean scores for frail vs. non-frail, 3.4 ± 0.7 vs. 1 ± 0.9, $P < 0.01$). Frail dialysis patients had significantly higher age (frail vs. non-frail, 78.4 ± 9.2 years vs. 65.5 ± 11 years, $P < 0.01$), higher prevalence of DM (frail vs. non-frail, 80% vs. 44%, $P = 0.04$), and lower serum albumin levels (frail vs. non-frail, 3.5 ± 0.3 mg/dL vs. 3.9 ± 0.3 mg/dL, $P < 0.01$) than non-frail ones, but no differences existed regarding anti-platelets/anticoagulants use, access age, or previous endovascular procedure frequencies. After 15.7 ± 8.8 months of follow-up, 19 (37.3%) participants developed VA failure. Accounting for age, dialysis duration, DM, and laboratory results, Cox proportional regression analysis showed that frailty increased the risk of VA failure during follow up (hazard ratio [HR] 2.63, 95% confidence interval 1.03–6.71, $P = 0.04$) (Fig. 1). Adjusting for anti-platelet and anticoagulant use did not alter our findings (HR 2.63, 95% CI 1.03–6.71, $P = 0.04$).

Functioning vascular accesses have been regarded as the lifelines for ESRD patients, and access failure is an important source of morbidity/mortality. Factors influencing access outcomes identified to date are limited to access materials and biochemical ones such as serum indoxyl sulfate levels.[9] In chronic kidney disease patients, frailty is found to be associated with endothelial dysfunction[10] and is frequently accompanied by elevated oxidative stress and low-grade inflammation in ESRD patients. In addition, frailty in older dialysis patients is also associated with cognitive dysfunction, which potentially leads to delayed recognition of dialysis access stenosis or thrombosis.

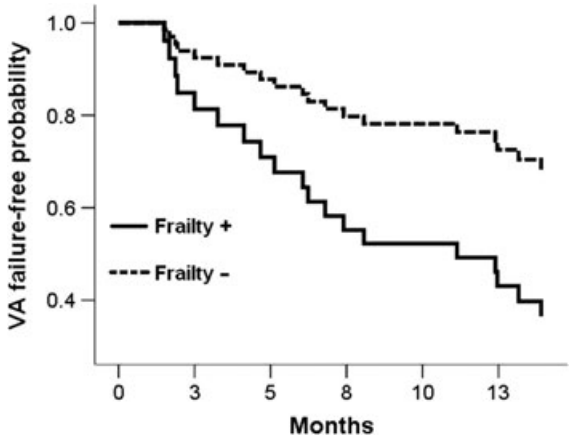

Fig. 1 Haemodialysis vascular access failure-free survival curves adjusted for demographic profiles, dialysis duration, diabetes, and laboratory data, based on the Cox proportional hazard model, in patients with and without frailty. VA, vascular access.

These reasons can be plausible explanations for the association we observed in this study. However, our study is limited in several aspects. First, the assessment results of self-reported frailty may be influenced by mis-perception of subjective health, cognitive dysfunction, and an impairment in communication ability accompanying advanced age. In addition, inter-rater variability is another theoretical concern, although we have minimized this possibility by meticulous training of nurse researchers before study initiation. Finally, low case number and the presence of other unmeasured confounding factors may limit the generalizability of our findings. In conclusion, the assessment of self-report frailty, a simple point-of-care instrument, in ESRD patients thus can aid in the identification of those at higher risk of developing dialysis access failure in the future.

AUTHOR CONTRIBUTIONS

Study design – CTC, JWH; Data analysis – CTC, CKC, JWH; Drafting article – CTC, CKC, JWH, KYH; Approval of article – all authors.

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CONFLICT OF INTEREST

On behalf of all authors, the corresponding authors state that there is no relevant financial or non-financial competing interest for this manuscript.

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Tuberculous peritonitis diagnosed with the help of 18F-FDG PET/CT scan

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Mycobaterium tuberculosis accounts for 4.47 % of all peritonitis episodes in peritoneal dialysis patients. In one of the reviews,[1] the treatment delay was identified as a significant factor for mortality in patients with tuberculous peritonitis. The peritoneal dialysate cell count could not be solely used to differentiate tuberculous peritonitis from other forms of peritonitis.[2] Many methods such as culture, smear, biopsy, and polymerase chain reaction (PCR) are useful in the diagnosis of peritoneal tuberculosis.[3] But low sensitivity of these methods is an impediment. We used 18F-fluorodeoxyglucose positron emission tomography/computerized tomography (18F- FDG PET/CT) scan to help in diagnosis of tuberculous peritonitis in three patients.

The first patient was a 35-year-old male with diabetes and hypertension who underwent peritoneal dialysis catheter insertion approximately 8 months ago for end stage renal disease. He was on automated peritoneal dialysis. He presented with complaint of fever of 1 week duration. The fever was of low grade, intermittent, associated with evening rise of temperature and had not subsided with antipyretics. There was history of abdomen pain and cloudy dialysate of 4 days duration.

On admission the patient had pallor and no palpable lymph nodes. His abdomen was tender. Dialysate was cloudy on the day of admission. There was no evidence of exit site or tunnel infection. He was started on intraperitoneal antibiotics after sending specimens for investigations. The dialysate total leucocyte cell count on first 3 days was 420, 320 and 280 cells/μL. The differential count was 85% lymphocytes on day 1, and