KSN 2021
FULLY VIRTUAL MEETING
September 02 (Thu) - 05 (Sun)

Abstract Submission No. : 2230

Short term aerobic cycling increase bone resorption markers in CKD/ESRD patients with fragility

Yi-Chou Hou[1], Kuo-Cheng Lu[2], Yueh-Min Liu[3]
[1]Department of Internal Medicine, Cardinal Tien Hospital, Taiwan
[2]Department of Department of Internal Medicine, Nephrology, Taipei Tzu Chi Hospital, Taiwan
[3]Department of Department of Nursing, Ching Kuo Institute of Management and Health, Taiwan

Objectives: Sarcopenia or frailty is the weak state during the aging process. In patients with chronic kidney disease (CKD), fragility and sarcopenia are more prevelant. Dual energy x-ray absorbance and the interaction between bone remodeling markers are developed for understanding the mechanism for fragility. It is not known if such an operation will affect the variation of serum bone remodeling markers in fragile CKD patients.

Methods: We enrolled the study subjects with 3 groups: health control (HC) group (eGFR >=60ml/min), CKD group (eGFR 15~60ml/min) and end stage renal disease group (ESRD, under maintenance renal replacement therapy). We define subjects with fragility based on the force of hand-grasping. We compared the myokine and bone remodeling markers, and the results of dual energy X-ray absorbance. In subjects with end-stage nephropathy, changes in myokin/bone remodelling markers were compared after 12 weeks of aerobic cycling exercise (30 minutes per dialysis session).

Results: Among the study subjects (HC: n=16; CKD n=17; ESRD n=41), the participants with fragility was higher in the ESRD (41.46% vs 25%(health control) and CKD (5.85%)). The N terminal propeptide of type I procollagen (PINP, AUC: 0.708, 95% CI 0.565-0.851, $p<0.05$) and gynoid lean mass (AUC 0.689, 95%CI 0.520-0.838, $p<0.05$), and gynoid total mass (AUC 0.728, 95% CI 0.575-0.881, $p<0.05$) were associated with fragility. PINP was correlated with serum creatinine ($r=0.639$, $p<0.05$), indoxyl sulfate ($r=0.603$, $p<0.05$), phosphate ($r=0.357$, $p<0.05$) and albumin($r=-.0.319$, $p<0.05$). After 12 weeks of exercise (n=17), the PINP was similar (1269.12 ± 533.41pg/mL vs 1766.68 ± 727.04 pg/ml, $p=0.117$) in ESRD patients. Both tartrate-resistant acid phosphate (TRACP, $p<0.05$) and type I collagen telopeptide N (NTX, $p<0.05$) have increased.

Conclusions: Fragility was more prevalent in ESRD patients. PINP and gynoid mass were linked to frailty in CKD patients. PINP levels were similar after 12 weeks of exercise while bone resorption markers increased.

Figure 1 The ROC curve of myokine and bone reabsorption markers for fragile

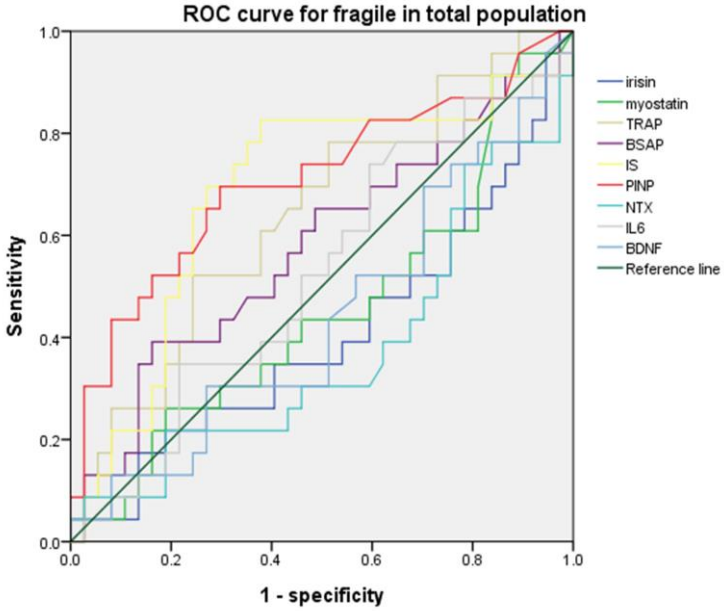

Figure 2 The ROC curve for DEXA for fragile in total population