Poor life prognosis of patients with rapid progression of peripheral artery disease

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Background: Peripheral artery disease (PAD) is one of the major complications in patients undergoing hemodialysis (HD), leading to a higher mortality risk. As skin reperfusion pressure (SRPP) measurement is a useful screening tool for PAD, early detection and prevention of progression using this tool would be important. However, only a few studies have focused on the speed of PAD progression, and its effects on life prognosis and associated factors have not been fully examined yet. We aimed to evaluate the impact of rapid progression of PAD on life prognosis and identify the factors associated with PAD prognosis.

Method: We included patients undergoing HD with more than two SRPP measurements at our facility between January, 2013 and August, 2022. Patients were followed up until August, 2022. Medical data were collected at the time of the first SRPP measurement, and the associations between survival and patient backgrounds were analyzed.

Results: The study included 142 patients (71.0±9.1 years old; 59.2% men; median dialysis vintage, 58.5 months). The median observation period was 1,142.5 days (interquartile range: 680.8-1,709.8 days), and 76 patients died during the observation time. Among the participants, 17 patients underwent lower limb amputation. The patients were divided into four groups, according to the SRPP reduction rate (Q1-4). Log-rank test analysis showed that patients with SRPP reduction rate Q4 had a poor prognosis ($p<0.001$). Multivariable Cox proportional hazards analysis demonstrated that SRPP reduction rate Q4 (hazard ratio, 2.51; 95% confidence interval [CI]: 1.46—4.30; $p<0.001$) was significantly associated with survival. Multivariable logistic regression analysis revealed that body mass index (BMI) (odds ratio [OR]: 1.13, 95% CI: 1.00—1.28, $p=0.048$) and serum creatinine level (OR: 0.77, 95% CI: 0.61—0.96, $p=0.02$) were associated with SRPP reduction rate Q4.

Conclusion: Patients with a large SRPP reduction rate had a poor life prognosis. BMI and serum creatinine levels were associated with a large SRPP reduction rate. As serum creatinine levels in patients undergoing HD can reflect their skeletal muscle mass, sarcopenic obesity, indicated by excessive BMI and low creatinine levels, may be a risk factor for the rapid progression of PAD in our participants. Maintaining adequate body weight and muscle mass is critical in preventing PAD progression.