

Abstract Submission No. : 1196

The Interleukin 6 is associated inflammatory biomarker for arteriovenous fistula failure in hemodialysis patients

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Objectives: Because of the worldwide increasing use of hemodialysis treatment due to the increasing incidence of ESRD, the patency of vascular access of hemodialysis patients is an important health problem. The inflammatory process has been proposed as a related factor to vascular dysfunction, but certain mechanisms are elusive and there are few studies on biomarkers related to inflammation. In this study, we investigated the biomarkers associated with AVF failure, especially the inflammation-related ones.

Methods: The data of K-cohort (CRIS no. KCT0003281) that prospectively enrolled end stage renal disease patients treated with hemodialysis were used. We recruited total 500 patients, and 403 patients were on hemodialysis treatment with AVF, and 282 patients with whole plasma samples at the time of the enrollment were included. The intervention-free survival was analyzed by Kaplan–Meier curve, and Cox proportional hazards models were used to investigate associations between possible factors and AVF failure events.

Results: Among the 282 patients with AVF, 38 patients had the AVF dysfunction events. Among the investigated inflammatory markers, the IL-6 level was only significantly higher in AVF dysfunction group. After adjustment for confounding variables, the association between plasma IL-6 tertile 3 and AVF dysfunction events remained significant (HR, 3.06; 95%CI, 1.25-7.49; $p=0.015$), and a Kaplan-Meier survival analysis revealed that AVF dysfunction free survival was significantly longer in lowest IL-6 level group. In subgroups stratified by DM, high IL-6 level showed a greater event risk even in the patients without DM level (HR, 4.81; 95%CI, 1.02-22.54; $p=0.047$). The patients with DM and low IL-6 level was not associated with the increased risk of AVF dysfunction.

Conclusions: In conclusion, the high level of IL-6 would be associated with AVF dysfunction events in patients on HD treatment, suggesting that it could be a possible therapeutic and diagnostic target in vascular dysfunction.