【Outstanding Academic Research Meeting II-2】

Thrombosis complications of hemodialysis vascular access: From observational studies to clinical trials

透析血管通路的血栓併發症：從觀察型研究到臨床試驗

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Thrombosis is the most common cause of secondary vascular access failure. Thrombosis is usually attributed to anatomical factors because luminal stenosis is found in 60% to 80% of cases. However, because 20% to 40% of cases of vascular access thrombosis occur in the absence of stenoses, and given that not all stenotic accesses thrombose, factors other than anatomical stenoses must contribute access thrombosis. Comprehensive evaluation of contributing factors for thrombosis is crucial to the care of dialysis accesses.

We investigated the clinical predictors of hemodialysis vascular access thrombosis by establishing a prospective cohort of maintenance hemodialysis patients to explore the unique predictors of uremic conditions, such as endothelial dysfunction, uremic toxins, blood pressure variability, and frailty. In 2018, we invited 12 hemodialysis centers, comprising four hospitals and eight clinics, in the Hsinchu District to initiate an observational cohort, which was followed for 5 years, concluding in December 2022. The Hsinchu VA study enrolled 1,136 patients, accounting for one-third of hemodialysis patients in the Hsinchu area. An analysis of this cohort revealed that frail hemodialysis patients were at a significantly higher risk of dialysis vascular thrombosis (Am J Kidney Dis, 2022). Hypotension and blood pressure variability also increase the risk of vascular access thrombosis (Front Cardiovasc Med, 2022). Vascular endothelial precursor cell deficiency is linked to early thrombosis after interventions (Sci Rep, 2019). Additionally, indoxyl sulfate and inflammation are associated with late thrombosis after angioplasty (J Am Soc Nephrol, 2016; Clin J Am Soc Nephrol, 2018).

We have performed a multi-center, randomized controlled study investigating effect of apixaban on preventing post-angioplasty thrombosis. A total of 186 patients were randomized to apixaban 2.5mg twice daily, or standard of care without maintenance anticoagulation for 3 months after endovascular salvage of vascular access thrombosis. The primary efficacy outcome (recurrent thrombosis) occurred in 22 patients in the apixaban group and in 38 patients in the standard of care group (hazard ratio, 0.52; 95% confidence interval [CI], 0.31-0.88, p=0.01). Major bleeding occurred in 2 patients of apixaban group (event rate: 2.2%) and 4 patients in the standard of care group (event rate: 4.3%).