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The Effect of Nitrate as a Vasodilator to Maintain Vascular Access Patency in the Patients Undergoing Hemodialysis

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Objectives: The vascular access (VA) failure is a major problem in hemodialysis (HD) patients. Thus, maintaining the patency of vascular access (VA) is challenging. In this study, we investigated the effects of nitrate as a vasodilator on VA failure in HD patients.

Methods: We investigated the Korean insurance claims data of the HD patients experienced angioplasty for VA failure between January 2012 and December 2017. All patients divided into two groups, no nitrate therapy (no-NT) vs. any nitrate therapy (NT). The primary endpoint was the access primary patency defined the time from arteriovenous dialysis access creation to the first PTA.

Results: A total 1,178 participants were included in this study. The mean duration from VA creation to first angioplasty in NT was shorter than non-NT significantly (NT vs. non-NT, 49.3 vs. 108.3 days, p=0.003). In Kaplan-Meier analysis, NT was lower probability of angioplasty than non-NT (Log-rank, P<0.001). And, NT showed a better prognosis in access primary patency (HR 0.92, CI 0.89-0.95, P<0.05) than non-NT. Multivariate Cox regression analysis revealed that NT had a decreased risk of angioplasty after adjustment for age, sex, hypertension, and diabetes (P<0.05).

Conclusions: In this large national database, we showed that nitrate therapy was associated with higher access primary patency in HD patients. Nitrate therapy may have a beneficial effect for maintaining vascular access patency in patients undergoing HD.