Shaping Tomorrow's Nephrology: Insight-Driven Kidney Care
KSN 2026 SEOUL, KOREA
The 46th Annual Meeting of the Korean Society of Nephrology
THE KOREAN SOCIETY OF NEPHROLOGY
Jun 11 (Thu) – 14 (Sun), 2026
COEX, Seoul, Korea

Abstract Type : Poster exhibition
Abstract Submission No.: A-0593
Abstract Topic : Dialysis

Association between blood pressure and clinical outcomes in patients undergoing maintenance hemodialysis

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Objectives : Despite the clinical importance of blood pressure control in patients undergoing hemodialysis (HD), evidence on the BP ranges associated with favorable outcomes remains limited and inconsistent.
Methods : We retrospectively analyzed the data from the HD quality assessments in South Korea. Systolic blood pressure (SBP) was classified into 6 groups: VL-sys group (< 100, n = 230), L-sys (100–120, n = 2.272), R-sys (120–140, n = 17,004), H-sys (140–160, n = 17,493), VH-sys (160–180, n = 4,627), and EH-sys (≥ 180, n = 632). Diastolic blood pressure (DBP) was divided into 6 groups: EL-dia (< 60, n = 1,349), VL-dia (60–70, n = 5,460), L-dia (70–80, n = 13,361), R-dia (80–90, n = 17,442), H-dia (90–100, n = 4,211), and VH-dia (≥ 100, n = 435). Outcomes include all-cause mortality, cardiovascular events (CVE), dementia, atrial fibrillation (Afib), and fracture risk.
Results : Higher SBP was associated with increased risks of all-cause mortality, CVE, dementia, and fractures compared to those of the R-sys group. Conversely, lower SBP was associated with reduced risks for all-cause mortality and CVE. The L-sys group had an adjusted hazard ratio of 0.92 (95% confidence interval [CI], 0.86–0.99) for all-cause mortality and 0.84 (95% CI, 0.76–0.93) CVE. Regarding DBP, in univariable analysis, survival rate was higher in the VH-dia group compared to reference group, but contradictive results were shown in multivariable analysis. Overall, in multivariable analysis, higher levels were associated with increased risks of all-cause mortality, CVE, and dementia, while lower DBP, particularly in the VL-dia and L-dia groups, was associated with reduced risks.
Conclusions : In our study, a SBP of 100–119 mmHg and a DBP of 60–79 mmHg were associated with improved overall survival, reduced incidence of CVE, and lower risk of dementia and fractures in patients undergoing HD.