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Cardiovascular and renal outcomes of the new intensive blood pressure target in chronic kidney disease population in Korea

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Objectives: The 2021 Kidney Disease: Improving Global Outcomes (KDIGO) Clinical Practice Guideline for the Management of Blood Pressure (BP) in CKD recommended a target standardized office systolic BP (SBP) <120 mmHg along with 2017 American College of Cardiology/American Heart Association (ACC/AHA) guidelines which defined "normal BP" as 120/80 mmHg. We evaluated the prevalence of cardiovascular events and CKD progression to assess the effects of this intensive BP target for CKD patients in Korea.

Methods: The data of 118407 adults whose baseline estimated glomerular filtration rate (eGFR) <60 mL/min/1.73 m^2 were extracted from January 2009 through December 2011 from the Korean National Health Insurance Service database. In multivariate Cox proportional hazards regression models, all participants were grouped into four SBP/DBP categories (<120/80 mmHg, 120-129/<80 mmHg, 130-139/80-89 mmHg, ≥140/90 mmHg). The primary outcome was cardiovascular disease (CVD) risk, and the secondary outcome was the risk of progression to end-stage renal disease (ESRD) except for the case with continuous renal replacement therapy.

Results: With up to 6 years follow-up, participants with SBP/DBP 120-129/<80 mmHg had a nonsignificant trend toward a higher risk for ischemic heart disease (IHD) (hazard ratio (HR), 1.22; 95% confidence interval (CI), 0.96-1.55; P = 0.11), and showed a significantly greater risk for stroke (HR, 1.55; 95% CI, 1.09-2.19; P = 0.01). Each risk for progression to ESRD increased statistically in three separate groups with 120-129/<80 mmHg; intermittent hemodialysis (HR, 1.56; 95% CI, 1.35-1.80; P <0.0001), peritoneal dialysis (HR, 1.56; 95% CI, 1.35-1.80; P <0.0001), and kidney transplantation (HR, 1.56; 95% CI, 1.35-1.80; P <0.0001). Similar significant statistical findings were observed between the rest of the BP groups and the group with <120/<80 mmHg.

Conclusions: Therefore, the new intensive BP target can be applied to reduce the risk of CVD and progression to ESRD with proper BP monitoring in a number of CKD outpatients.

Table 1. cardiovascular disease reisk and chronic kidney disease progression in the study

Outcome	SBP /DBP	Hazard Ratio	95% CI	P value
Primary outcome				
Ischemic heart disease	<120 and <80mmHg	1.00		
	120-129 and <80mmHg,	1.22	0.96-1.55	0.11
	130-139 or 80-89mmHg,	1.47	1.20-1.80	0.0002
	≥140 or ≥90mmHg	1.52	1.21-1.93	0.0004
Stroke	<120 and <80mmHg	1.00		
	120-129 and <80mmHg,	1.55	1.09-2.19	0.01
	130-139 or 80-89mmHg,	1.48	1.09-2.01	0.01
	≥140 or ≥90mmHg	1.82	1.29-2.58	0.0008
Secondary outcome				
Intermittent hemodialysis	<120 and <80mmHg	1.00		
	120-129 and <80mmHg,	1.56	1.35-1.80	<0.0001
	130-139 or 80-89mmHg,	1.86	1.65-2.10	<0.0001
	≥140 or ≥90mmHg	2.63	2.28-3.04	<0.0001
Peritoneal dialysis	<120 and <80mmHg	1.00		
	120-129 and <80mmHg,	1.68	1.26-2.25	0.0005
	130-139 or 80-89mmHg,	1.76	1.37-2.27	<0.0001
	≥140 or ≥90mmHg	2.55	1.86-3.47	<0.0001
Kidney Transplantation	<120 and <80mmHg	1.00		
	120-129 and <80mmHg,	1.59	1.20-5.11	0.001
	130-139 or 80-89mmHg,	1.70	1.33-2.17	<0.0001
	≥140 or ≥90mmHg	2.51	1.84-3.41	<0.0001