KSN 2021
FULLY VIRTUAL MEETING
September 02 (Thu) - 05 (Sun)

Abstract Submission No. : 2451

Pulse Pressure and the Risk of Renal Hyperfiltration in Young Adults

Eun JI Yang, Gang Yoon Lee, Donghwan Oh, Hoon Young Choi, Hyeong Cheon Park, Jong Hyun Jhee
Department of Internal Medicine-Nephrology, Gangnam Severance Hospital, Korea, Republic of

Objectives: Pulse pressure (PP) is a surrogate marker of arterial stiffness. Previous studies suggest that arterial stiffness results in renal hyperfiltration (RHF). However, the association between PP and RHF is not well established in young adults. This study aimed to investigate the association between PP and RHF in Korean young adults without hypertension

Methods: Data were retrieved from the Korean National Health and Nutrition Examination Surveys (2010-2019). A total of 10,365 participants aged 19-39 years with normal kidney function and without hypertension were enrolled. The participants were divided into quartile based on PP. RHF was defined as eGFR with residuals >90th percentile after adjusting for sex, age, weight, and height.

Results: Mean age of the participants was 30.1 ± 6.1 years, and 44.9% were male. The mean levels of PP were 27.8 ± 2.8, 33.9 ± 1.4, 38.8 ± 1.38, and 47.1±5.2 in quartile 1 to 4 respectively. The prevalence of RHF was significantly higher in higher quartiles (7.5%, 10.2%, 10.4%, and 11.6% respectively; *P* for trend <0.001). The association between PP and the risk for RHF was analyzed by multivariable logistic regression, the higher quartiles showed increased risks for RHF compared to lowest quartile (odds ratio [OR], 1.38; 95% confidence interval [CI], 1.14-1.67; *P*=0.001 in quartile 2; OR, 1.41; 95% CI, 1.16-1.72; *P*=0.001 in quartile 3, and OR, 1.60;95% [CI], 1.31-1.96; *P*<0.001 in quartile 4). When subgroup analysis was performed stratified with age, sex, body mass index (<25 or ≥ 25kg/m^2), and history of diabetes, an increased risks with higher quartiles of PP for RHF was consistent regardless of subgroups.

Conclusions: Elevated levels of PP is associated with an increased risk of RHF in Korean young adults with normal kidney function. Longitudinal studies are needed to investigate whether high PP associated RHF is an early risk factor for kidney injury in young adults

Table 1. Baseline characteristics

Characteristics	Pulse pressure quartile				*P*
	Q1 (n=2615)	Q2 (n=2844)	Q3 (n=2570)	Q4 (n=2336)	
Demographic data					
Age, years	31.08±5.883	30.60±6.013	30.15±6.087	28.41±6.319	<0.001
BMI, kg/m^2	22.28±3.486	22.76±3.599	23.36±3.903	24.14±4.128	<0.001
Smoking status, n (%)	874 (33.1%)	1030 (36.2%)	1015 (39.3%)	1039 (44.2%)	<0.001
Alcohol status, n (%)	2548 (24.5%)	2745 (26.4%)	2484 (23.9%)	2248 (21.6%)	<0.001
SBP, mmHg	101.24±7.270	106.37±7.861	110.87±8.366	117.40±9.450	<0.001
DBP, mmHg	73.38±7.038	72.40±7.747	72.00±8.263	70.25±8.949	<0.001
Education, n (%)					<0.001
Low	932 (35.6%)	1112 (39.1%)	1462 (27.9%)	1185 (50.7%)	
High	1683 (64.4%)	1732 (60.9%)	1494 (58.1%)	1151 (49.3%)	
Income, n (%)					<0.001
Low	1241 (46.8%)	1400 (49.2%)	1259 (49.0%)	1202 (51.5%)	
High	1414 (53.2%)	1444 (50.8%)	1311 (51.0%)	1134 (48.5%)	
Comorbidities, n (%)					
Diabetes	18 (0.62%)	14 (0.44%)	14(0.49%)	17 (0.82%)	0.835
Dyslipidemia	55 (1.9%)	65 (2.08%)	54(1.89%)	49 (1.92%)	0.007
Laboratory data					
eGFR (MDRD), mL/min/1.73 m^2	104.73±17.17	106.23±17.64	106.02±17.43	107.83±18.72	<0.001
Proteinuria (%)	405 (15.3%)	345 (12.1%)	375 (14.6%)	353 (15.2%)	0.001
Hemoglobin, g/dL	13.92±1.49	14.06±1.59	14.20±1.67	14.53±1.72	<0.001
Fasting plasma glucose, g/dL	90.89±12.74	91.31±14.53	92.20±16.02	92.34±13.95	<0.001
HbA1c, %	5.38±0.51	5.36±0.46	5.40±0.48	5.39±0.47	0.052
Total cholesterol, mg/dL	185.28±34.10	183.30±32.40	184.37±32.77	182.16±32.98	0.006
LDL-C, mg/dL	109.02±29.97	106.95±29.98	107.76±28.92	105.39±30.18	<0.001

Note: Data are presented as mean (SD), median [IQR], or number (%).

Abbreviations: BMI, body mass index; SBP, systolic blood pressure; DBP, diastolic blood pressure; eGFR, estimated glomerular filtration rate; LDL-C, low density lipoprotein-cholesterol;; SD, standard deviation.

Table 2. Risk of RHF according to pulse pressure quartile group

	Model 1		Model 2		Model 3	
	OR (95% CI)	*P*	OR (95% CI)	*P*	OR (95% CI)	*P*
Pulse pressure (per 1 mmHg)	1.021 [1.013-1.030]	<0.001	1.027[1.018-1.036]	<0.001	1.022[1.013-1.031]	<0.001
Q1			(Reference)			
Q2	1.394[1.153-1.684]	0.001	1.429[1.182-1.728]	<0.001	1.383[1.142-1.674]	0.001
Q3	1.423[1.174-1.725]	<0.001	1.496[1.232-1.817]	<0.001	1.414[1.162-1.721]	0.001
Q4	1.604[1.323-1.945]	<0.001	1.781[1.460-2.174]	<0.001	1.600[1.306-1.960]	<0.001

Note: Model 1: Unadjusted model

Model 2: Adjusted for age, sex

Model 3: Adjusted for age, sex, BMI, income, education, DM history, alcohol, smoking, hemoglobin, total cholesterol, urine protein

Abbreviations: BMI, body mass index; OR, odds ratio; CI, confidence interval