

Abstract Submission No. : 2196

Effect of orthostatic hypotension on kidney function

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Objectives: It is known that orthostatic hypotension (OH) is associated with adverse outcomes such as cardiovascular disease and mortality. However, there are few studies that reported the association of kidney function with OH. We examined the association of OH with the overall change in kidney function over 12 years.

Methods:

We analyzed data from a population-based cohort that was part of the Korean Genome and Epidemiology Study. Primary exposure was the presence of sustained OH, which was defined as a postural drop in blood pressure (BP) (systolic BP ≥ 20 mm Hg and/or diastolic BP ≥ 10 mm Hg) at both 0 and 2 minutes of standing after 5 minutes of supine rest. Primary outcome was decline in kidney function over 12 years. Secondary outcome was a rapid decline in kidney function defined as a decrease in estimated glomerular filtration rate (eGFR) ≥ 20 mL/min/1.73 m² over 12 years.

Results: Our study included 5,905 participants (median [interquartile range] age, 49 [44–58]; 46% males). Of these, 136 (2.3%) participants developed sustained OH, 835 developed OH only immediately after standing up (OH_{0min}), and 132 developed OH two minutes after standing (OH_{2min}). Compared to the participants without sustained OH, those with sustained OH had greater decline in eGFR over 12 years; fully adjusted beta coefficient and 95% confidence intervals (95% CIs) were -1.95 (-3.81, -0.10). In 3,536 (59.9%) participants, the eGFR decreased by more than 20 mL/min.1.73 m² over 12 years. The participants with sustained OH had higher odds of a rapid decline in kidney function than those without sustained OH; the fully adjusted odds ratio and 95% CIs were 1.93 (1.20, 3.09). The presence of OH_{0min} or OH_{2min} was not associated with decline in kidney function compared to the absence of OH.

Conclusions:

Our results suggest that sustained OH can negatively affect long-term kidney function in the general population.