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**Nocturnal hypertension, Not Morning Hypertension Is Associated with
Kidney Outcome in Patients with Hypertension: Findings From the
Cardiovascular and Metabolic Disease Etiology Research Center-High Risk
(CMERC-HI) Study**

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Objectives: Morning hypertension (MH) is associated with target organ damage in patients with hypertension. However, the association between subtypes of MH determined by the presence or absences of sustained nocturnal hypertension (NH) and kidney outcome is unclear. This study aimed to evaluate the effects of MH subtypes on kidney outcome in patients with hypertension.

Methods: 1,678 hypertensive patients from CMERC-HI (2013–2018) study with eGFR ≥ 30 mL/min/1.73 m² were analyzed. MH subtype (MHS) was grouped as four subtypes: MHS1, no MH with no NH; MHS2, MH with no NH; MHS3, no MH with NH; MHS4, MH with NH. Kidney outcome was defined as new occurrence of eGFR < 60 mL/min/1.73 m² or overt proteinuria in patients with baseline eGFR ≥ 60 mL/min/1.73 m² and 30% decline in eGFR from baseline in those with baseline eGFR < 60 mL/min/1.73 m².

Results: The mean age was 61.3 ± 11.1 years and 864 (51.5%) were men. 24-hour mean SBP and DBP were the highest in MHS4. Mean morning BPs and the degree of morning surge were higher in MH groups (MHS2 and MHS4) than non-MH groups. During a median follow-up of 4.7 [2.6-6.5] years, 570 events (74.8 per 1,000 person-years) of the kidney outcome occurred. The incidence of kidney outcome was 61.5, 61.3, 68.5, and 89.9 per 1000 person-years in MHS1 to 4 (*P* for trend < 0.001). Kaplan-Meier analysis showed that MHS4 was related to the highest risk of kidney outcome (hazard ration [HR], 1.46; 95% confidence interval [CI], 1.18-1.81). In multivariable Cox analysis, MHS3 and MHS4 were associated with a higher risk of the kidney outcome compared with MHS1 (HR, 1.52; 95% CI, 1.06-2.17 in MHS3 and HR, 1.46; 95% CI, 1.05-2.03 in MHS4, respectively).

Conclusions: Sustained NH regardless of combined MH was associated with higher risk of poor kidney outcome in patients with hypertension.

Table 1. Figure 1. Kaplan Meier curve for kidney outcome according to morning hypertension subtypes