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CKD & associated complications

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Clinical Outcomes According to Nocturnal BP Dipping Pattern and Hypertension Control in Hypertensive Patients: results from the APrODiTe study with 5-year follow-up

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Background: Blood pressure (BP) is one of the most important factors for occurrence of chronic kidney disease and cardiovascular event. We reported BP control status and nocturnal BP dipping pattern in CKD patients in Korea through APrODiTe study. We investigated association of kidney function, all-cause mortality and cardiovascular event according to BP control status and nocturnal dipping status.

Methods: We recruited 193 hypertensive patients (chronic kidney disease stage 2-4, mean age 57.2 ± 12.2) from 2 centers in Korea who enrolled APrODiTe study. Clinical information such as office BP, names and types of anti-hypertensive medication at initial and last visit were collected. We used initial office BP for categorizing BP control and dipping status, and these were identical with previous APrODiTe study. BP control categories were 'true controlled (20.2%)', 'white-coat (2.6%)', 'masked (36.8%)' and 'sustained uncontrolled hypertension (40.4%)'. Dipping status were categorized 'extreme-dipper (17.6%)', 'dipper (35.8%)', 'non-dipper (32.6%)' and 'reverse-dipper (14.0%)' according to the ratio of the mean nighttime SBP to the mean daytime SBP. Renal outcome was defined as the events of 50% reduction of estimated glomerular filtration rate (eGFR) and end-stage renal disease (ESRD). Cardiovascular (CVD) event included ischemic and hemorrhagic cerebrovascular infarction, percutaneous coronary intervention and coronary artery bypass surgery.

Results: There was a significant difference between initial and last BP according to control groups, but not according to dipping pattern. Generally, the number of prescribed hypertensive medication was decreased comparing initial and last visits (2.3 ± 1.1 vs. 1.4 ± 0.8). Physicians prescribed more anti-hypertensive medication in sustained uncontrolled and reverse-dipper group. Total 43 cases of renal outcome were occurred during total 59.2 ± 16.5 follow-up months. The patients with non-dippers or reverse-dippers showed the poorer renal outcome than the patient with dippers or extreme dippers by Log Rank Test ($p=0.042$). Non-dippers/reverse-dippers group (HR 1.856, 95% CI 1.011-3.405, $p=0.046$) had worse renal outcome than dippers/extreme dipper group in univariate analysis. On the contrary, there is no significant association between dipping status and renal composite outcome after adjustment including age, diabetes in multivariate analysis (HR 1.721, 95% CI 0.936-3.615, $p=0.08$). There are no definite relationships between BP control categories (true controlled/white coat vs. masked/uncontrolled) and renal outcome. Also, there was no significant association between BP control status (BP control categories and dipping status) and all-cause mortality, so did CVD event.

Conclusion: We demonstrated that nocturnal dipping pattern is a more important factor than BP control status for kidney function in CKD patients. Further studies with longer follow-up and more participants should be included to apparent this conclusion.

Table:

Keywords: blood pressure, chronic kidney disease, hypertension, kidney function