



Importance of plasma aldosterone concentrations as a clinical indicator of nocturnal hypertension in primary aldosteronism

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Keywords Primary aldosteronism · Aldosterone · Nocturnal hypertension

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Patients with primary aldosteronism (PA) have a higher risk of cardiovascular disease than those with essential hypertension [1, 2]. Many studies have been conducted on the risk of cardiovascular disease in clinical indices of PA patients. A recent report stated that patients with primary aldosteronism who remain renin suppressed during mineralocorticoid receptor antagonist treatment might have a higher risk of developing cardiovascular disease than those with unsuppressed renin activity [3]. However, another study showed that a significant change in renin level after mineralocorticoid receptor antagonist treatment may not necessarily predict a better prognosis of cardiovascular disease in patients with primary aldosteronism [4]. In contrast, hyperaldosteronism plays an essential role in the development of cardiovascular disease in patients with PA [1, 5]. However, clinical indices that allow stratification of the risk of developing cardiovascular disease in patients with PA have not yet been established.

In this situation, Morita R et al. investigated the association between plasma aldosterone concentration (PAC) and ambulatory blood pressure monitoring (ABPM) profile in patients with confirmed PA [6]. The nocturnal blood pressure (BP) dipping rates were significantly lower in the high PAC group than in the low PAC group. Although basal PAC did not significantly correlate with nocturnal blood pressure dipping rates, post-adrenocorticotrophic hormone (ACTH) stimulation PAC had a significant negative correlation with nocturnal BP dipping rates. Moreover, multiple regression analysis showed that high PAC was an independent factor contributing to low nocturnal BP dipping rates. Considering these results, the authors concluded that hyperaldosteronism

is associated with nocturnal hypertension and that high PAC is a significant risk factor for cardiovascular disease in patients with PA. In addition, the authors indicated that ACTH stimulation may improve the sensitivity of PAC as a clinical indicator of nocturnal hypertension.

A 10–20% decrease in systolic BP at night compared with that in the daytime are classified as “dippers,” and nocturnal hypertension has under 10% lower BP at night classified as “non-dippers”. Nocturnal hypertension is considered an important cardiovascular risk, and nocturnal BP dipping rate has the potential to be a clinical marker for response to PA therapy [7–9]. Furthermore, clinical studies in Japanese subjects have also shown that the nocturnal BP dipping rate is closely related to the risk of developing cardiovascular disease [10]. Morita et al. demonstrated that high PAC in PA patients is associated with a nocturnal BP dipping rate and that ACTH stimulation is a valuable method to increase the sensitivity of this relationship. These results benefit the development of specific and practical treatment strategies to reduce the incidence of cardiovascular events in PA patients. The strategy of risk stratification of patients with PA by measuring PAC with ACTH challenge and using improvement in nocturnal hypertension with ABPM as a measure of efficacy is simple and versatile in the treatment of patients with PA whose main goal is to avoid cardiovascular events.

The authors assessed the mechanism in which high PAC with reduced nocturnal BP dipping rates. The primary mechanism is increased circulating plasma volume due to sodium reabsorption caused by hyperaldosteronism. Another possible mechanism involves vascular function. However, as discussed by the authors, renal function, plasma brain natriuretic peptide levels, and vascular function were not significantly associated with PAC in the present study. Because of a cross-sectional study with few participants, a causal relationship between high PAC and low nocturnal BP dipping could not be established. Large-scale, longitudinal prospective cohort studies are necessary to address this issue.

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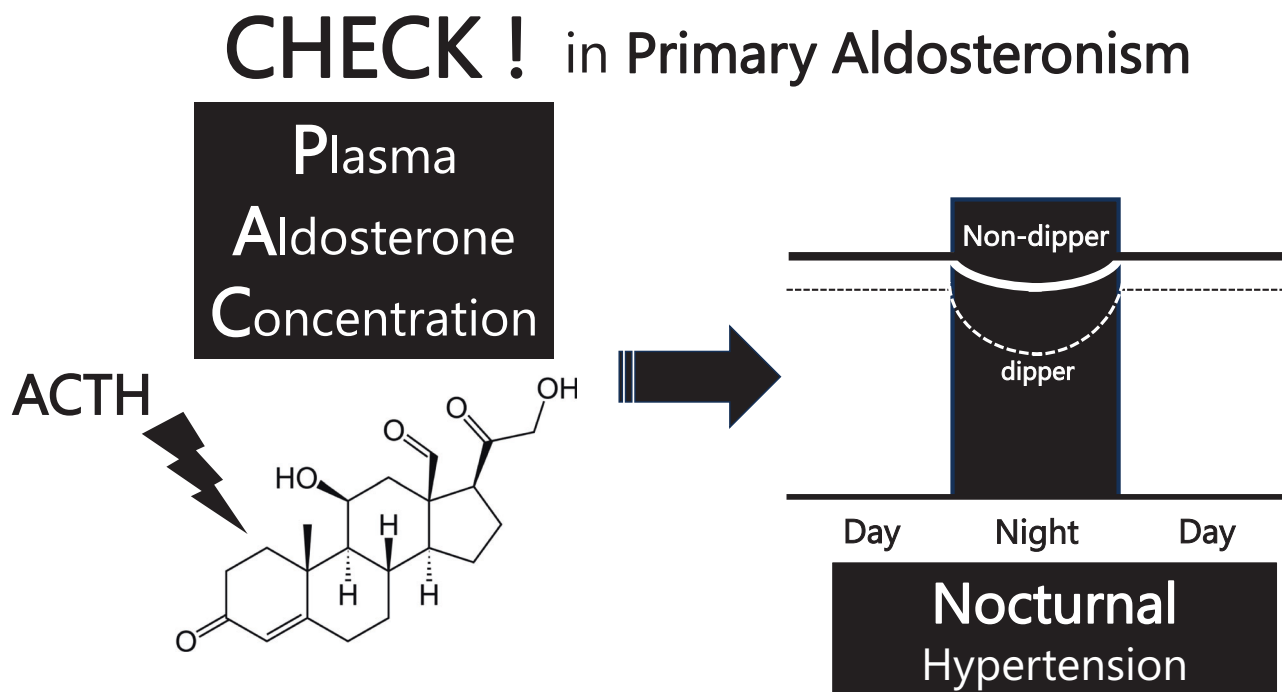


Fig. 1 Important clinical significance of plasma aldosterone concentration measurement in primary aldosteronism practice as suggested by the paper with Morita R et al.

Although there are several unsolved issues, this paper by Morita R et al. shows us that risk stratification using PAC may be helpful in treating patients with PA to prevent the development of cardiovascular events. Furthermore, it is of significant academic interest that ACTH loading further enhances this possibility. This paper also reminded us of the significance of nocturnal hypertension in ABPM. It is no exaggeration to say that these are significant clinical findings for all healthcare professionals in treating patients with PA (Fig. 1).

Compliance with ethical standards

Conflict of interest The author declares no competing interests.

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