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Key Words

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Differential Effects of Angiotensins on Blood Pressure, Drinking and Renal Function in WKY and SHR Rats

ABSTRACT

Recent studies have suggested that several angiotensins other than angiotensin II might play physiological roles in the brain to regulate thirst and other volume conservation mechanisms. The present study was designed to investigate the effects of intravenous or intracerebroventricular administrations of angiotensins II, (1-7), (3-8), and (4-8) on blood pressure, water intake, and renal function in spontaneously hypertensive rats and Wistar-Kyoto normotensive rats. Intravenous administrations of angiotensin (1-7), (3-8), or (4-8) caused no significant increase in blood pressure in either rat group. Central injection of angiotensin (3-8) caused a similar pressor effect but a lower drinking response as compared to angiotensin II in both rat groups. Central injections of angiotensins (1-7) and (4-8) had neither pressor nor drinking effect in either rat group. Central infusions of angiotensins (1-7) and (3-8) significantly decreased absolute and fractional excretions of sodium and increased free water reabsorption rates in both rat groups. The results suggested that angiotensin (3-8) in the brain might be involved in blood pressure and body fluid homeostasis. Furthermore, angiotensin (1-7) may also play a role in the regulation of body fluids.

INTRODUCTION

Over the past 20 years, many studies have investigated the physiological and pathophysiological roles of the renin-angiotensin system.¹⁻³ In this system, angiotensin II (Ang II) is known to be the most important peptide in the regulation of vascular resistance, the control of aldosterone secretion, and thus in the control of body fluid balance.^{4,5} Recent studies have suggested

that Ang II is not the only biologically active peptide generated by the renin-angiotensin system.^{6,7} In general, angiotensins are the biological products of the cleavage of angiotensinogen (renin substrate) by renin, angiotensin-converting enzyme, and subsequent actions of angiotensinases on angiotensin II.^{8,9}

Recently, another bioactive peptide of the renin-angiotensin system, angiotensin (1-7) (Ang 1-7), has been suggested to be biologically active.⁹ Moriguchi et

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