

## Saltless Diet Damages the Heart through Activation of Cardiac (Pro) Renin Receptor and Renin-Angiotensin-Aldosterone and Sympatho-Adrenal Systems in Spontaneously Hypertensive Rats

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### Summary

High salt-intake causes hypertension and leads to cardiovascular disease. Therefore, low salt diet is now recommended to prevent hypertension and cardiovascular disease. However, it is still unknown whether excessive low salt diet is beneficial or harmful for the heart. Wistar Kyoto rats (WKYs) and spontaneously hypertensive rats (SHRs) received normal-salt chow (0.9 % salt diet) and excessive low salt chow (0.01% salt diet referred to as saltless diet) for 8 weeks from 8 to 16 weeks of age. The effects of saltless diet on cardiac (pro) renin receptor system and renin-angiotensin-aldosterone and sympatho-adrenal systems were investigated.

Saltless diet did not affect systolic blood pressure but significantly increased heart rate both in WKYs and SHRs. Saltless diet significantly elevated plasma renin activity, plasma angiotensin I, II, aldosterone, noradrenaline and adrenaline concentrations both in WKYs and SHRs. In an echo, interventricular septum thickness (IVSth), an indicator of left ventricular (LV) hypertrophy, significantly increased from 8 to 16 weeks of age. The IVSth was greater in the saltless diet group than in the normal salt group both in WKYs and SHRs. Cardiac expressions of renin, prorenin, (P)RR, angiotensinogen, and angiotensin II AT1 receptor were significantly enhanced by saltless diet in both WKYs and SHRs.

In conclusion, saltless diet suggest a possibility to damage the heart through activation of plasma renin-angiotensin-aldosterone and sympatho-adrenal systems and activation of cardiac tissue (P)RR and angiotensin II AT1 receptor both in WKYs and SHRs.