

Interaction between Dietary Salt and Saccharina Japonica Extract or Dried Bonito Extract on Blood Pressure in 2-Kidney, 1-Clip Renovascular Hypertensive Rats

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Summary

Introduction: We recently demonstrated that the intake of *Saccharina japonica* (SJ) and SJ extract (SJE) decreased blood pressure (BP) in 2-kidney, 1-clip hypertensive (2K1C) rats. We also observed that 2K1C rats fed a high salt diet showed higher BP than those fed a normal salt diet, and that dietary SJ decreased BP to the similar level in both group: the effect of SJ was stronger in 2K1C rats fed a high salt diet than fed a normal salt. In this study, we observed the dietary effects of SJ, SJE and dried bonito extract (DBE), which is also reported to decrease BP, on BP in 2K1C rats fed a normal (NS) or high salt (HS) diet in order to investigate whether SJE and/or DBE decreases BP to the similar level in 2K1C rats fed a high salt to which it did in those fed a normal salt, as in the case of SJ. We also measured urinary and fecal sodium excretion in each group to explore the participation of salt in the mechanism.

Methods: Male Sprague-Dawley rats (6 wks, n=7-9 per group) were treated with sham operation (SHAM) or clipping the left renal artery (2K1C). After surgery, the rats started receiving a NS (0.7% NaCl) or HS diet (6.0% NaCl), with or without 5.0% (w/w) SJ or SJE or DBE by pair feeding for 6 weeks. Systolic BP (SBP) was measured by a tail-cuff method every week. In the last week, 24-hrs urine and feces were collected through simple metabolic cage to measure urinary and fecal sodium excretion.

Results: Dietary SJ showed the same results as our previous study, which is described above. Dietary SJE significantly decreased SBP in 2K1C rats fed a NS diet, and decreased it with a marginal significance in those fed a HS diet. When fed SJE, SBP in HS was significantly higher than in NS, which was different from SJ decreasing BP to the similar level in both group. SJ diet induced an increase in fecal sodium excretion compared to a diet without SJ when fed a HS diet, while SJE diet tended to increase urinary sodium excretion. DBE diet significantly decreased SBP in both NS and HS groups, but they did not get to the similar level as in the case of SJ. DBE did not affect urinary and fecal sodium excretion.

Conclusions: Dietary intake of SJ, SJE and DBE attenuated BP in 2K1C rats, respectively. SJ, but not SJE nor DBE, showed a stronger decrease in BP when 2K1C rats fed a HS diet compared with a NS diet. On the basis of the data of urinary and fecal sodium excretion in each group, the role of salt in the mechanism of decreasing BP by them was probably varied.