

The Optimal Amount of Salt Intake

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Sodium excretion is associated with increased blood pressure. The INTERSALT study revealed a significant linear relationship between the median 24-hour urinary sodium excretion in 52 centers and the slope of systolic blood pressure with age in age and sex-standardized analysis 1. A pooled analysis of the results of four large studies, the PURE, EPIDREAM, ONTARGET and TRANSCEND studies, also showed that the estimated 24-hour urinary sodium excretion was associated with increased systolic and diastolic pressure 2.

However, the association between urinary sodium excretion and cardiovascular events remains controversial. The above-mentioned pooled analysis showed that salt restriction reduced the risk of cardiovascular events and death in populations with hypertension and that an association of extensively low sodium intake with increased risk of cardiovascular events and death is observed in those with or without hypertension 2. Meanwhile, the Trials of Hypertension Prevention (TOHP) showed an increased risk of mortality for individuals with high sodium intake and a direct relationship with total mortality, even at the lowest levels of sodium intake 3. Therefore, the optimal level of sodium intake has been unclear.

Reduction of sodium intake is recommended in the guidelines of the European Society of Hypertension, American Heart Association, Japanese Society of Hypertension and WHO 4-6. Although the optimal level of sodium intake is controversial, a sodium reduction program is likely to be beneficial for prevention of cardiovascular diseases in communities in which people consume

high amounts of salt 7. The UK initiated a nationwide salt reduction program in 2003/2004, which was successful and resulted in a 15% reduction in population salt intake by 2011 (from 9.5 g/day in 2003 to 8.1 g/day in 2011). The Health Survey for England conducted from 2003 to 2011 showed decreases of 42% and 40% in the mortality rates of stroke and ischemic heart disease, respectively, along with decreases in systolic/diastolic blood pressure of 3.0/1.4 mmHg. A recent community-level prospective epidemiological cohort study showed that sodium intake was associated with cardiovascular disease and stroke only in communities in which the mean sodium intake was more than 5 g/day 8. Data from a prospective cohort study of a Chinese population also showed that high urinary sodium excretion was independently associated with an increased risk of cardiovascular disease 9. Japan is a country in which people consume a large amount of salt. The National Health and Nutrition Survey in Japan, 2017 showed that the mean dietary salt intake in the period from 2007 to 2017 was 9.9 g/day (https://www.mhlw.go.jp/bunya/kenkou/kenkou_eiyou_chousa.html). The ESPRIT study, a prospective observational study, showed that, in Japan, high sodium excretion (≥ 4.0 g/day) was associated with composite cardiovascular events including hospitalization due to heart failure, acute coronary syndrome, cerebrovascular events and cardiovascular deaths 10. It seems difficult to determine the optimal amount of salt intake, but a strategy of sodium reduction would be appropriate in communities in which people prefer to season their food with salt.

Conflict of interest: The authors declare no conflict of interest.

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