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Studies on Detection of Salt-sensitivity -related Features in Subjects Taking High Salt Diets -In Search of Nutritional Factors Attenuating Salt-induced Blood Pressure Rise

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Summary

Since salt-induced blood pressure elevation is influenced by other nutritional factors, the association of salt intake with blood pressure (BP) was investigated in Japanese and Mediterranean diet's populations (J , M) compared with Euro-Western diet's populations (EW), and also in the elderly Japanese of Nagahama Cohort study covering 12000 inhabitants.

Methods

1. From 61 populations of Cardiovascular Diseases and Alimentary Comparison (CARDIAC) Study, 6 Japanese (Aomori, Toyama, Hiroshima, Shimane, Ohita, Okinawa) and 6 Mediterranean populations (Greece, Sicilia, Italy, Spain<Madrid, Navas>, Portugal) and 6 Euro Western populations (Ireland, Scotland, Sweden, Canada, Australia, New Zealand) were selected, and 24-hour urine (24U) samples from 1029 people aged 48-56 in these populations were examined for their sodium(Na), potassium(K), magnesium(Mg) and Na/K ratios in relation with BP.
2. From 992 elderly aged 60-80 years of Nagahama Cohort, 24U Na, K, Mg and Na/K were examined in relation with BP.

Results

1. Despite the significantly higher 24U Na, systolic and diastolic BP (SBP, DBP) were significantly lower in J and M than EW. In both J and M, 24U Mg, the biomarker of beans, grains, vegetables, dietary fivers or dairy products were higher than in EW, and 24U K from vegetables and fruits in M was higher than in EW.
2. Despite the significant difference in 24U Na between the 4^{th} quantile and the 1^{st} quantile, SBP and DBP were not significantly different between these quantiles. 24U Mg and K were significantly higher in the 4^{th} quantile of Na than in the 1^{st} quantile of Na, indicating the attenuation of salt-induced BP rise by Mg and K.

Conclusion

Although 24U Na excretions were higher in J and M than in EW, SBP and DBP were significantly lower in J and M than in EW where 24U Mg was lower than in J and M and 24UK was lower than in M. In the Japanese elderly of Nagahama Cohort, 24UNa was highest in the 4^{th} quantile of Na. But both SBP and DBP of the 4^{th} quantile of Na in which 24UMg and K were significantly higher than in the 1^{st} quantile of Na, were not significantly different from the 1^{st} quantile.

These epidemiological findings clearly indicate the adverse effect of high salt intake is attenuated by other diets containing Mg and K.

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