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Sodium Excretion and Health-Related Quality of Life: The Results from the Korea National Health and Nutrition Examination Survey 2010~2011

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Background: World Health Organization (WHO) and most guidelines recommend a strict reduction in sodium intake <2g/day (5g/day salt) in order to reduce blood pressure and cardiovascular disease. However, this recommendation is not confirmed by a large randomized controlled trial. Large observational studies have shown that low sodium excretion is associated with higher mortality. In addition, little is known about the effect of sodium intake on health-related quality of life (HR-QOL). In this study, we investigated the association between sodium excretion and HR-QOL in Korean adults.

Methods: We analyzed 10,672 participants from Korea National Health and Nutrition Examination Survey (KNHANES) 2010~2011. We used sodium excretion as a surrogate marker of sodium intake, and 24-hour urine sodium excretion was estimated from random urine sodium and creatinine using Tanaka formula. HR-QOL was assessed using EQ-5D (EuroQol five-dimension) index calculated from Korean version of EQ-5D questionnaire. Low HR-QOL was defined as lowest quartile of EQ-5D index. Multiple complex survey designs of KNHANES were reflected in all statistical analyses. Multiple linear regression analysis was used to calculate the adjusted mean of EQ-5D index. Multiple logistic regression analysis was used to determine the odds ratio (OR) and confidence interval (CI) for the low HR-QOL of low sodium excretion group compared with moderate sodium excretion group. Both regression analyses used age, sex, body mass index, education level, house income, hypertension, diabetes, chronic kidney disease, ischemic heart disease, stroke, alcohol consumption, smoking status and amount of exercise as covariates.

Results: Participants were divided into three groups according to their sodium excretion level (low, < 2.0g/day; moderate, 2.0~3.9g/day; high, >4.0g/day). Adjusted means of EQ-5D index were 0.981, 0.995 and 0.991 in the low, moderate and high sodium excretion group respectively (P=0.005 for low vs moderate, P=0.186 for high vs moderate). In a multivariate logistic analysis, the OR for low EQ-5D in the low sodium excretion group compared to the moderate group was 1.71 (95% CI, 1.29-2.26; P<0.001). The OR in the high sodium excretion group compared to the moderate group was 1.13 (95% CI, 0.95-1.34; P=0.160).

Conclusion: Low sodium excretion rather than high excretion was associated with low HR-QOL in representative Korean adults. This result suggests that we need more evidences before we continue to recommend a strict sodium restriction among general population.

Keywords: Health-related quality of life, Sodium excretion, Sodium intake