

Article

Association between 24 h Urinary Sodium and Potassium Excretion and Dietary Intake in Japanese Male Adolescent Football Players

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Abstract: High urinary sodium-to-potassium ratio is considered a strong risk factor for hypertension. This study aimed to evaluate urinary excretion of sodium and potassium, and we analyzed these levels associated with dietary intake in Japanese adolescent football players. This cross-sectional study included 120 Japanese male adolescent football players. Over 24 h, urine was collected and measured for creatinine, sodium, and potassium levels. A dietary assessment was performed using a self-administered diet history questionnaire. The study analyzed 79 participants. The mean urinary sodium was 143.2 mmol/day, urinary potassium was 42.8 mmol/day, and the mean urinary sodium-to-potassium ratio was 3.6. Compared with the Japanese Dietary Reference Intakes, the estimated salt intake was 73.4% for the participants who exceeded the sodium intake, and the estimated potassium intake was 73.4% for the participants who did not satisfy it. Multiple regression analysis revealed that milk and dairy product intake was independently and positively associated with urinary potassium ($\beta = 0.252$) and independently and negatively associated with the urinary sodium-to-potassium ratio ($\beta = -0.254$). Adolescent football players had a high-sodium and low-potassium diet, well above the Japanese Dietary Reference Intakes recommendations. Milk and dairy products could be effective for increasing urinary potassium and decreasing the urinary sodium-to-potassium ratio.

Keywords: adolescent football players; cardiovascular diseases; urinary potassium; urinary sodium; urinary sodium-to-potassium ratio; dietary intake

Article

Associations between Milk and Dairy Product Intake, Urinary Sodium-to-Potassium Ratio, and Socioeconomic Status in Japanese Male Adolescents

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Abstract: Although socioeconomic status (SES) may affect children's urinary electrolytic excretion and dietary intakes, few studies have reported the association between SES and urinary sodium (Na)-to-potassium (K) ratio in Japanese adolescents and children. Therefore, this study aimed to investigate the association between SES and urinary Na/K ratio (Analysis 1) and between dietary intake and urinary Na/K ratio to determine the SES effects in children and adolescents (Analysis 2). This cross-sectional study included 168 Japanese male adolescent and child football players. The urinary Na/K ratio was calculated from three spot urinary electrolyte values. Multiple regression analysis was performed in both first and second analyses to assess the associations between SES and the urinary Na/K ratio and between dietary intake and the urinary Na/K ratio for ages 9–12 and 13–15 years separately. The mean urinary Na/K ratio was 4.8, with higher SES associated with a lower urinary Na/K ratio. Our results suggested that urinary Na/K ratios in Japanese child football players were high due to poor childhood diets, and higher SES was associated with lower urinary Na/K ratios. Further, milk and dairy products are associated with the urinary Na/K ratio, independent of SES in children and adolescents.

Keywords: cardiovascular diseases; adolescents and children; urinary sodium-to-potassium ratio; dietary intake; socioeconomic status