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Association with Dietary Sugar Intake and Hyperuricemia in Korean Children and Adolescents: Korea National Health and Nutrition Examination Survey

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Objectives : The global prevalence of hyperuricemia is steadily increasing, with reports indicating an upward trend not only in adults but also in children and adolescents. This study aimed to examine the association of dietary factors with hyperuricemia among Korean children and adolescents in addition to known other risk factors, utilizing data from the Korean National Health and Nutrition Examination Survey (KNHANES).
Methods : This cross-sectional study included 1,268 subjects aged 10-18 years from the eighth KNHANES 2019-2021. Dietary information was collected using a single 24-hour recall methods. Utilizing the density method, we converted fat, protein, and sugar intakes into percentages of daily energy intake (% energy) and investigated sodium density (mg/kcal) through the ratio of sodium intake to daily energy intake. The associations between hyperuricemia and converted intake of protein, fat, sodium, and sugar were analyzed using multiple regression analysis adjusting for confounding variables [age, gender, blood pressure, estimated glomerular filtration rate, body mass index, and hemoglobin A1C].
Results : Among the 1,268 subjects (median age of 13 years, males - 56%), 150 subjects (12%) had hyperuricemia. Subjects with hyperuricemia had older age, higher BMI and HbA1C and lower eGFR compared to subjects without hyperuricemia, However, no significant differences were observed in the amounts of dietary intake of total energy, protein, fat, sugar, and sodium between two groups. In the multiple regression analysis, higher sugar intake was independently associated with hyperuricemia [odds ratio (OR) 1.76, 95% CI: 1.12-2.79, p=0.016], along with obesity (OR 5.49, p <0.001), Age of 13-15 (OR 2.02, p=0.002) and lower eGFR (OR 1.83, p=0.01).
Conclusions : Our findings indicate that higher sugar intake, along with obesity and reduced kidney function, acts as a risk factor for hyperuricemia. Therefore, we suggest that a dietary approach to reduce sugar intake may be beneficial for preventing and managing hyperuricemia in Korean children and adolescents.

Table 1. Multivariable logistic regression analysis of the association between hyperuricemia and adjusted variables including BMI, Age, Gender, Blood pressure, HbA1c, eGFR, and sugar intake.jpg

		Normal n (%)	Hyperuricemia n (%)	Odds ratio (95% CI)	*P* value
BMI status	Normal	861 (93.0)	65 (7.0)	Ref	
	Overweight	107 (82.3)	23 (17.7)	2.92 (1.69-4.89)	<0.001
	Obesity	150 (70.8)	62 (29.2)	5.49 (3.63-8.34)	<0.001
Age (years)	10-12	449 (92.0)	39 (8.0)	Ref	
	13-15	355 (84.5)	65 (15.5)	2.02 (1.29-3.19)	0.002
	16-18	314 (87.2)	46 (12.8)	1.37 (0.80-2.35)	0.248
Gender	Female	500 (89.4)	59 (10.6)	Ref	
	Male	618 (87.2)	91 (12.8)	0.97 (0.65-1.45)	0.892
Blood pressure status	Normal	894 (89.1)	109 (10.9)	Ref	
	Prehypertension	129 (86.6)	20 (13.4)	0.84 (0.47-1.44)	0.551
	Hypertension	95 (81.9)	21 (18.1)	1.13 (0.63-1.95)	0.681
HbA1c status	HbA1c < 5.7	967 (89.5)	114 (10.5)	Ref	
	HbA1c ≥ 5.7	151 (80.7)	36 (19.3)	1.56 (0.99-2.43)	0.052
eGFR status	eGFR ≥ 90	864 (89.9)	97 (10.1)	Ref	
	eGFR < 90	254 (82.7)	53 (17.3)	1.83 (1.15-2.90)	0.010
Sugar intake	Low intake	384 (90.8)	39 (9.2)	Ref	
	Intermediate intake	369 (87.4)	53 (12.6)	1.44 (0.91-2.30)	0.119
	High intake	365 (86.3)	58 (13.7)	1.76 (1.12-2.79)	0.016

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