



Relationship between uric acid and lipid profiles in patients with type 2 diabetes

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Aims

High level of uric acid is known to associate with stroke, coronary artery disease and metabolic syndrome. Some epidemiologic studies suggested that high uric acid level is connected with dyslipidemia. However, this relationship was not examined in type 2 diabetic patients. This study was conducted to investigate the association between serum uric acid level and lipid profiles in type 2 diabetic patients

Methods

A total of 972 type 2 diabetes patients were included in the present study. We measured height, body weight and blood pressure. Biochemical parameters including low density lipoprotein (LDL), high density lipoprotein (HDL), triglyceride (TG) and total cholesterol (TC) were checked.

Results

Table 1. Basal Characteristics in the Subjects

N=972	Mean ± S.D
Age (years)	56.90±13.91
Sex, n (males/females)	507/465
BMI (kg/m ²)	23.89±3.88
SBP (mmHg)	125.16±15.36
DBP (mmHg)	79.93±13.74
Uric acid	4.98±2.01
FBS (mg/dL)	170.34±77.55
Hba1c (%)	8.97±2.41
BUN (mg/dL)	18.12±12.41
Cr (mg/dL)	1.24±4.03
LDL (mg/dL)	110.85±41.55
HDL (mg/dL)	47.91±16.82
TG (mg/dL)	156.12±120.15
T-chol (mg/dL)	181.89±54.70
Uacr	292.72±1122.99
Smoking status	
Nonsmoker, n (%)	486
Exsmoker, n (%)	110
Current smoker, n (%)	125
Hypertension, n (%)	429 (44.13%)
Lipid lowering agent use, n (%)	309 (31.79%)

BMI, body mass index; SBP, systolic blood pressure; DBP, diastolic blood pressure; FBS, fasting blood sugar; HbA1c, hemoglobin A1c; BUN, blood urea nitrogen; Cr, creatinine; LDL, low-density lipoprotein; HDL, high-density lipoprotein; TG, triglyceride; T-chol, total cholesterol; uACR, urine albumin-creatinine ratio

The mean age of total subjects was 56.90±13.91 and men were 507 (52.2%). The mean body mass index (BMI) was 23.89±3.88.

Table 2. Correlations between uric acid and biochemical markers

	R	P
Age	0.125	0.000*
BMI	0.142	0.000*
SBP	0.100	0.002*
DBP	0.026	0.426
BUN	0.301	0.000*
Cr	0.079	0.014
FBS	-0.042	0.216
HbA1c	-0.081	0.012
LDL	0.035	0.288
HDL	-0.171	0.000*
TG	0.155	0.000*
T-chol	0.039	0.226

BMI, body mass index; SBP, systolic blood pressure; DBP, diastolic blood pressure; BUN, blood urea nitrogen; Cr, creatinine; FBS, fasting blood sugar; HbA1c, hemoglobin A1c; LDL, low-density lipoprotein; HDL, high-density lipoprotein; TG, triglyceride; T-chol, total cholesterol

* P < 0.05

In the univariate analysis, TG and uric acid level was significantly positively correlated ($r=0.155$, $P<0.001$). HDL was significantly negatively associated with serum uric acid ($r=-0.171$, $P<0.001$). LDL and T-chol were not related with uric acid level.

Table 3. Multiple logistic regression analysis of uric acid level adjusted for age, sex and BMI

Factor	Beta coefficient	OR (95% CI)	P value
LDL	0.056	0.000 ~ 0.006	0.078
HDL	-0.111	-0.021 ~ -0.006	0.001*
TG	0.131	0.001 ~ 0.003	0.000*
T-chol	0.059	0.000 ~ 0.004	0.061

LDL, low-density lipoprotein; HDL, high-density lipoprotein; TG, triglyceride; T-chol, total cholesterol

* P < 0.05

Multiple regression analyses were then performed by adjusting for age, sex and body mass index. The significantly positive association between TG and uric acid was retained (beta coefficient = 0.131, $P < 0.001$). The negative connection between HDL and uric acid was persisted (beta coefficient = -0.111, $P = 0.001$).

Conclusion

In the present study, we found that serum uric acid level is significantly positively associated with TG, whereas it is significantly inversely associated with HDL in type 2 diabetic patients. Management for hyperuricemia may help to control dyslipidemia in patients with type 2 diabetes.

