COMMENTS AND RESPONSES

High Serum Uric Acid as a Novel Risk Factor for Type 2 Diabetes

Response to Dehghan et al.

We read with interest the recent article by Dehghan et al. (1), who suggest that serum uric acid might be a strong and independent risk factor for diabetes. In particular, it was reported that the age- and sex-adjusted hazard ratios for diabetes were 1.30 for the 2nd quartile, 1.63 for the 3rd quartile, and 2.83 for the 4th quartile of serum uric acid, in comparison with the 1st quartile. To further investigate the association between uric acid and glucose homeostasis, we performed a retrospective analysis on the database of the Laboratory Information System of the Clinical Chemistry Laboratory at the Verona University Hospital to retrieve results of plasma uric acid (PUA), fasting plasma glucose (FPG), and A1C tests, which were performed on the entire cohort of outpatient adults (>35 years of age) consecutively referred by general practitioners for routine medical checkup in the past 3 years (January 2005–January 2008). Neither inclusion nor exclusion criteria were adopted to stratify the entire population of outpatients. Venous blood was routinely collected in the morning from fasting subjects. FPG (hexokinase method) and PUA (uricase/peroxidase enzymatic method) concentrations were assayed on Roche/Hitachi Modular System P (Roche Diagnostics, Milan, Italy). A1C was measured by high-pressure liquid chromatography on a fully automated bench-top analyzer (Automated G7 HbA1c Glycohemoglobin Analyzer; Tosoh, Kyoto, Japan). Cumulative results for FPG, PUA, and A1C were retrieved for 3,167 subjects (median age 67 years [range 35–98], 1,833 male and 1,334 female). The study population was clustered into quartiles of PUA (≤267, 268–327, 328–398, and ≥399 μmol/l, respectively). We observed no significant differences by Kruskal-Wallis test in the value distribution of age (geometric mean ± SEM 68 ± 0.5, 68 ± 0.4, 68 ± 0.4, 69 ± 0.5 years, respectively; $P = 0.129$), FPG (6.8 ± 0.1, 6.9 ± 0.1, 6.9 ± 0.1, 6.7 ± 0.1 mmol/l, respectively; $P = 0.065$), and A1C (6.5 ± 0.1, 6.7 ± 0.1, 6.5 ± 0.1, 6.5 ± 0.1%, respectively; $P = 0.098$) among quartiles of PUA. Accordingly, no significant differences were also observed in the frequency of abnormal values of both FPG (FPG >7.1 mmol/l = 45, 46, 46, and 42%, respectively; $P = 0.933$) and A1C (A1C >7.0% = 37, 39, 32, and 35%, respectively; $P = 0.761$) among quartiles of PUA.

Although some previous investigations suggested that uric acid level might be positively associated with serum glucose in healthy subjects (2,3), this relationship was proven to be inconsistent between healthy and diabetic individuals (4,5), suggesting that there is not enough evidence for measuring and monitoring uric acid level in diabetic patients and that measurement of uric acid might reliably predict impaired glucose tolerance and diabetes. Considering the limits of a cross-sectional and retrospective analysis, the results of our investigation are consistent with the hypothesis that the relationship between uric acid level in serum or plasma and glucose homeostasis remains elusive, in that no significant associations were observed between PUA and either FPG or A1C in a large cohort of adult unselected outpatients.

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