Clinical and epidemiological research
Concise report

Relationship between serum urate concentration and clinically evident incident gout: an individual participant data analysis

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Abstract

Objectives To provide estimates of the cumulative incidence of gout according to baseline serum urate.

Methods Using individual participant data from four publicly available cohorts (Atherosclerosis Risk in Communities Study, Coronary Artery Risk Development in Young Adults Study, and both the Original and Offspring cohorts of the Framingham Heart Study), the cumulative incidence of clinically evident gout was calculated according to baseline serum urate category. Cox proportional hazards modelling was used to evaluate the relation of baseline urate categories to risk of incident gout.

Results This analysis included 18 889 participants who were gout-free at baseline, with mean (SD) 11.2 (4.2) years and 212 363 total patient-years of follow-up. The cumulative incidence at each time point varied according to baseline serum urate concentrations, with 15-year cumulative incidence (95% CI) ranging from 1.1% (0.9 to 1.4) for <6 mg/dL to 49% (31 to 67) for ≥10 mg/dL. Compared with baseline serum urate <6 mg/dL, the adjusted HR for baseline serum urate 6.0–6.9 mg/dL was 2.7, for 7.0–7.9 mg/dL was 6.6, for 8.0–8.9 mg/dL was 15, for 9.0–9.9 mg/dL was 30, and for ≥10 mg/dL was 64.

Conclusions Serum urate level is a strong non-linear concentration-dependent predictor of incident gout. Nonetheless, only about half of those with serum urate concentrations ≥10mg/dL develop clinically evident gout over 15 years, implying a role for prolonged hyperuricaemia and additional factors in the pathogenesis of gout.

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Footnotes

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Correction notice: This article has been corrected since it published Online First. The results section of the abstract has been corrected.

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