Göteborg, 2021

The population burden of gout and urate in Western Sweden

Prevalence, incidence, comorbidities, and association with cardiovascular disease

Akademisk avhandling

Som för avläggande av medicine doktorsexamen vid Sahlgrenska akademin, Göteborgs universitet kommer att offentligen försvaras i föreläsningssalen våning 3, Guldhedsgatan 10A, Göteborg, den 26 november, klockan 09.00

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Avhandlingen baseras på följande delarbeten

I. Dehlin M, **Drivelegka P**, Sigurdardottir V, Svärd A, Jacobsson LTH. Incidence and prevalence of gout in Western Sweden. Arthritis Research & Therapy 2016; 18:164

II. **Drivelegka P**, Sigurdardottir V, Svärd A, Jacobsson LTH, Dehlin M. Comorbidity in gout at the time of first diagnosis: sex differences that may have implications for dosing of urate lowering therapy. Arthritis Research & Therapy 2018; 20:108

III. **Drivelegka P**, Forsblad-d'Elia H, Angerås O, Bergström G, Schmidt C, Jacobsson LTH, Dehlin M. Association between serum level of urate and subclinical atherosclerosis: results from the SCAPIS Pilot. Arthritis Research & Therapy 2020; 22:37

IV. **Drivelegka P**, Jacobsson LTH, Lindström U, Bengtsson K, Dehlin M. Incident gout and risk of first-time acute coronary syndrome: a prospective, population-based, cohort study in Sweden. Manuscript.

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The population burden of gout and urate in Western Sweden

Prevalence, incidence, comorbidities, and association with cardiovascular disease

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Abstract

Background: Gout is the most common type of inflammatory arthritis and is associated with several comorbidities and an increased risk of cardiovascular disease (CVD). However, data on the epidemiology and comorbidity patterns of gout in Sweden are scarce, and whether its association with CVD is causal or not, is not clear.

Objectives: This thesis aimed to study: I. The incidence and prevalence of gout and use of urate lowering treatment (ULT) in Western Sweden in 2012; II. The comorbidity pattern of gout at the time of first diagnosis; III. The association between urate levels and markers of subclinical atherosclerosis; IV. The risk of first-time acute coronary syndrome (ACS) in patients with incident gout, compared to the general population.

Methods: Part I. By using data from the population-based register VEGA, we identified all patients with ≥1 ICD-coded diagnosis of gout at both primary and specialized health care in Western Sweden. Their dispensed prescriptions were identified through linkage with Prescribed Drug Register. Part II. Cases with first ICD-coded gout diagnosis in the period 2006-2012 were matched to population controls on age, sex, and county at first gout diagnosis. We estimated crude, and age-standardized prevalence and prevalence ratios. Part III. Participants of the pilot Swedish CArdioPulmonary bioImage Study (SCAPIS) underwent radiographic investigations for estimation of Coronary Artery Calcification score (CAC), carotid intima-media thickness (CIMT) and carotid plaque score. Their association with urate levels was assessed with logistic regression analysis. Part IV. Cohorts of patients with incident gout and population controls followed prospectively. Incidence rates (IRs), incidence rate ratios (IRRs), and hazard ratios (HRs) were used for risk estimations.

Results: Part I. The prevalence of gout in adults aged ≥ 20 years in 2012 was 1.8% and the incidence was 190 cases per 100,000 person-years. The incidence increased by 50% from 2005 to 2012. Only 42% of gout patients received ULT in 2012. Part II. At the time of first diagnosis, 77% of gout patients had at least one comorbidity, as compared to 56% of the controls. Women with gout were six years older and had higher occurrence of most comorbidities, compared to men. Part III. Serum urate levels >308 μmol/L were associated with the presence of CAC in men (p-value <0.05), but not in women, whereas urate levels were not associated with CIMT or carotid plaques in either men or women. Part IV. Patients with incident gout were at increased risk of first-time ACS, compared to the general population (HR, 1.44; 95%CI, 1.33-1.56). After adjustments for traditional cardiovascular risk factors, this risk was attenuated, but remained significant (HR, 1.15; 95%CI, 1.06-1.25).

Conclusions: Gout has an increasing incidence in Western Sweden, but only a minority of gout patients received ULT. The comorbidity burden at the time of first gout diagnosis is high, particularly in women. Urate may be associated with coronary calcification in men. Gout patients are at increased risk of first-time ACS, which is mainly depending on the underlying comorbidities and, to a lesser extent, on gout itself. Our results imply the importance of improvements in the management of gout and its comorbidities in the Swedish health care system, for increased longevity and better quality of life for these patients.

Keywords: gout, epidemiology, comorbidities, cardiovascular disease

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