Sex-related differences in gout: a comparative study in a Moroccan cohort.

ABSTRACT

Background:

The aim of this study was to characterize sex-related differences in the clinical, biological, and therapeutic features of gout in a Moroccan cohort.

Methods:

We conducted a cross-sectional study including 147 patients with gout (92 men and 55 women). Epidemiological, clinical, biological, radiological, and therapeutic characteristics were analyzed and compared according to sex.

Results:

Compared with men, women with gout were older (64.9 vs. 60.85 years) and had a higher prevalence of cardiometabolic comorbidities, particularly hypertension and diabetes ($p < 0.05$). Renal involvement was significantly more frequent and more severe in women ($p = 0.003$). In contrast, men exhibited a more inflammatory and severe disease profile, with higher pain scores and elevated C-reactive protein levels ($p = 0.003$), as well as a higher frequency of tophi and structural joint damage. No significant differences were observed regarding monoarticular versus polyarticular presentation. Treatment patterns were broadly similar between sexes, although colchicine use was significantly more frequent in men ($p = 0.001$).

Conclusion:

Men and women with gout exhibit distinct clinical phenotypes. Female gout is characterized by a predominantly metabolic and renal profile, whereas male

gout is associated with a more inflammatory and structural disease pattern. These findings highlight the need for sex-specific management strategies.

Keywords:
Gout;Sex; Comorbidities; Renalimpairment; Inflammation

INTRODUCTION

Gout is the most common inflammatory arthritis, with a prevalence estimated between 1% and 4% in Western countries, and has been steadily increasing over recent decades [1–3]. This trend is largely attributed to population aging, the rising prevalence of cardiometabolic comorbidities, and the increased use of medications promoting hyperuricemia, particularly diuretics [2,3]. Gout is associated with impaired quality of life, functional limitations, and increased cardiovascular morbidity and mortality [1,23].

Historically considered a predominantly male disease, gout in women has recently gained increasing attention. Its prevalence rises significantly after menopause, likely due to the loss of the uricosuric effect of estrogens [4,10–13]. Women with gout are generally older at diagnosis and present with a higher prevalence of comorbidities, particularly hypertension, diabetes, and chronic kidney disease, compared with men [5–8,14]. In contrast, men more frequently exhibit lifestyle-related risk factors, such as alcohol consumption and dietary habits, as well as a more inflammatory and structurally severe disease pattern [2,4,8,9].

Despite these findings, gout in women remains under-recognized and insufficiently studied. Many studies include relatively small numbers of women or lack detailed sex-based analyses [5–7]. Moreover, treatment strategies are

often not sex-specific, despite the existence of distinct clinical profiles suggesting the need for individualized management [15,16,24].

In this context, and given the increasing burden of gout, it is essential to better characterize sex-related differences across diverse populations. Data from North African countries remain scarce.

The aim of our study was therefore to compare epidemiological, clinical, biological, radiological, and therapeutic characteristics of gout between men and women in a Moroccan cohort. We hypothesized that female gout is characterized by a predominantly metabolic and renal profile, whereas male gout presents a more inflammatory and structural phenotype.

MATERIALS AND METHODS

We conducted a cross-sectional study including 147 patients with gout (92 men and 55 women), followed in a rheumatology setting. The diagnosis of gout was based on clinical and biological findings and/or the identification of monosodium urate crystals in synovial fluid, in accordance with the 2015 ACR/EULAR classification criteria.

Data were collected retrospectively from medical records and completed during clinical visits. Variables included sociodemographic characteristics, comorbidities (hypertension, diabetes, dyslipidemia, renal impairment), and risk factors such as smoking, alcohol consumption, diuretic use, and family history of gout.

Clinical assessment included age at disease onset, pattern of joint involvement, number of flares, joint distribution, pain intensity assessed using a visual analog scale (VAS), presence of tophi, and chronicity of gout. Biological parameters included serum uric acid, C-reactive protein (CRP), and renal function assessed by creatinine clearance.

Radiological evaluation included standard radiographs assessing structural damage and ultrasonography identifying the double contour sign. Synovial fluid analysis was performed when available to detect monosodium urate crystals.

Treatments were analyzed by distinguishing symptomatic therapy (colchicine, nonsteroidal anti-inflammatory drugs, corticosteroids) and urate-lowering therapy (allopurinol, febuxostat).

Quantitative variables were expressed as mean ± standard deviation and qualitative variables as frequencies and percentages. A bivariate analysis was performed to compare variables according to sex, with a significance threshold set at $p < 0.05$. No multivariate analysis was performed.

The study was conducted in accordance with the Declaration of Helsinki. Approval was obtained from the local ethics committee, and informed consent was obtained from all patients.

Table 1. Sociodemographic characteristics, comorbidities, and risk factors according to sex

Variables	Men (n=92)	Women (n=55)	p-value
Meanage (years)	60.85 ± 13	64.9 ± 11	0.122
Diabetes	18.47%	38.18%	0.025

Hypertension	34.7%	58.18%	0.006
Dyslipidemia	18.4%	21.8%	0.622
Diuretic use	23.9%	18.9%	0.43
Smoking	13.04%	1.8%	0.032
Alcoholconsumption	9.2%	0%	0.02
Family history of gout	8.7%	0%	0.025

91 **Table 2. Clinical and biological characteristics according to sex**

Variables	Men	Women	p-value
Monoarticular	67.3%	74.5%	0.35
Polyarticular	32.6%	25.4%	0.36
VAS	49.89 ± 17	41.09 ± 18	0.05
Renalinvolvement	23.9%	31.6%	0.023
Tophi	10.8%	3.6%	0.04
Chronic gout	35.4%	29.3%	>0.05
Serumuricacid	81.23 ± 24	77.28 ± 24	>0.05
CRP	71.20 ± 19	46.77 ± 21	0.003
Creatinine clearance	51.4 ± 22	36.2 ± 21	0.003
MSU crystals	15.21%	10.9%	>0.05

Table 3. Radiological and therapeutic data

Variables	Men (n=92)	Women (n=55)	p-value
Radiographicerosions	34.5%	18.9%	>0.05
Double contour sign (ultrasound)	70.5%	88.8%	>0.05
Colchicine	88%	62%	0.001
NSAIDs	16.3%	9.09%	0.22
Corticosteroids	16.3%	11%	0.37
Allopurinol	78.26%	69.09%	0.32
Febuxostat	9.8%	12.7%	0.71

DISCUSSION

In our study, we compared men and women with gout and identified significant differences in clinical, biological, and therapeutic profiles. Women were older and had a higher prevalence of cardiometabolic and renal comorbidities, whereas men exhibited a more inflammatory and structurally severe disease pattern.

Our findings are consistent with the literature, which reports a male predominance of gout but an increasing frequency in women, particularly after menopause [1–4]. Women in our cohort were older at diagnosis, in agreement with observational studies showing a delay of several years compared to men

[5–9]. This difference is largely attributed to the protective effect of estrogens on urate metabolism, which declines after menopause [10–13].

Comorbidity profiles also differed by sex. Women more frequently had diabetes, hypertension, and chronic kidney disease, as reported in several international cohorts [5–8,14]. These findings likely reflect older age and a higher burden of cardiovascular risk factors. In contrast, men more frequently exhibited lifestyle-related risk factors, including smoking and alcohol consumption [2,4,8,9,17,18].

Clinically, joint distribution did not differ significantly between sexes, consistent with previous studies [19,20]. However, disease severity was greater in men, with higher pain levels, more frequent tophi, and more pronounced structural damage, in line with previous reports [2,3,8].

Biological findings reinforced this distinction. Serum uric acid levels were similar, but men had higher inflammatory markers, whereas women had more impaired renal function, suggesting different underlying mechanisms [7,21].

Therapeutic approaches were broadly similar. However, higher colchicine use in men may reflect greater inflammatory activity. In contrast, more cautious management is often adopted in women due to age and comorbidities, consistent with current recommendations [15,16,24]. Previous studies have also shown that women less frequently achieve target urate levels [4,6,8,23–26].

These findings have important clinical implications. In women, management should focus on controlling metabolic comorbidities and renal function. In men, lifestyle modifications remain essential to prevent gout flares.

Our study has limitations, including its monocentric design, relatively small sample size, and retrospective data collection. Additionally, some factors such as dietary and hormonal variables were not systematically assessed.

Nevertheless, this study provides original data from a Moroccan population and confirms clinically relevant sex-related differences in gout. These findings support the need to integrate sex as a key determinant in gout management.

CONCLUSION

Men and women with gout exhibit distinct clinical phenotypes. Female gout is characterized by a predominance of metabolic and renal comorbidities, whereas male gout is associated with a more inflammatory and structurally severe disease pattern.

These findings highlight the importance of considering sex-specific differences in the clinical assessment and management of gout. Tailored therapeutic strategies that account for comorbidities, renal function, and lifestyle factors may improve patient outcomes.

Further studies, particularly prospective and multicenter investigations, are needed to better understand these differences and optimize personalized management approaches.

Conflict of interest

The authors declare no conflicts of interest.

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