



## CHARACTERISTICS OF PATIENTS WITH GOUT COMPLICATED BY KIDNEY AND LIVER DAMAGE

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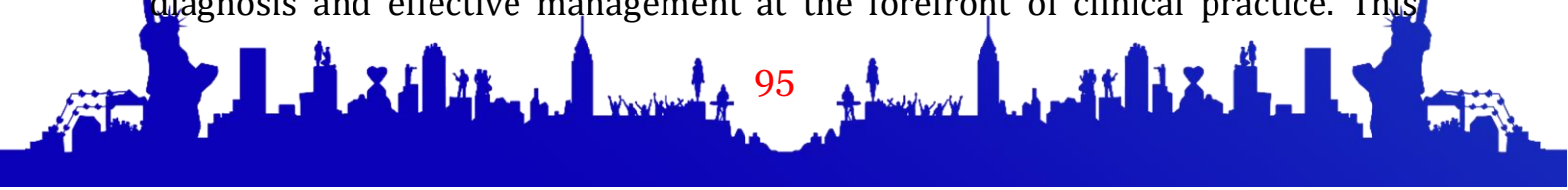
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**Abstract.** Gout is a chronic metabolic disorder resulting from persistent hyperuricemia and disturbances in purine metabolism. While joint involvement represents the classical clinical manifestation, extra-articular complications—particularly kidney and liver damage—play a decisive role in disease prognosis. This study aimed to characterize the clinical, biochemical, and demographic profiles of patients with gout complicated by renal and hepatic impairment. Analysis demonstrated that renal damage was associated with decreased glomerular filtration rate, urate nephropathy, and higher frequency of hypertension, whereas hepatic involvement was reflected by elevated transaminases, dyslipidemia, and metabolic syndrome components. Patients with combined kidney and liver damage were found to have a more severe disease course, greater inflammatory activity, and an increased burden of comorbidities compared to those without organ involvement. These findings emphasize the importance of early identification of renal and hepatic dysfunction in gout patients, which may contribute to improved risk stratification, individualized therapeutic strategies, and enhanced long-term outcomes.

**Keywords:** gout, kidney damage, liver damage, clinical characteristics, comorbidities, prognosis.

**Introduction.** Gout is one of the oldest known human diseases, characterized by inflammation and the deposition of uric acid crystals in joints and various tissues, leading to severe pain, swelling, and inflammation. Among rheumatic diseases, gout is considered one of the most well-studied and manageable entities. Its global prevalence varies from <1% to 6.8%, influenced by factors such as geography, genetics, age, and gender, with a higher incidence in men and older age groups (Dehlin et al., 2020).

In recent decades, there has been an active search for candidate genes associated with hyperuricemia (HU) and gout, focusing on the genetic regulation of uric acid synthesis and excretion. The increasing incidence of gout among younger populations and the challenges in its early diagnosis underscore the need for a deeper understanding of its pathogenesis and associated complications. Gout often follows a chronic, progressive course, placing the task of early diagnosis and effective management at the forefront of clinical practice. This





study aims to provide a comprehensive clinical and laboratory characterization of patients with primary gout, with a particular emphasis on those with concomitant kidney and liver damage.

**Materials and methods:** This research was conducted at the Central Hospital of the Samarkand City Medical Association. The study included 75 patients with a confirmed diagnosis of primary gout. Patients were categorized into three groups based on the presence of organ damage:

**Results. Patient Demographics and Clinical Characteristics:** The mean age of the patients was  $55.9 \pm 8$  years. The mean age at disease onset was  $44.8 \pm 8$  years, with the majority of patients (71.1%) developing the disease between 35 and 52 years. The median disease duration at the time of the study was 5.2 years. Recurrent arthritis was observed in 48% of patients, while 52% had a chronic arthritis course. The median number of affected joints per patient was 9. Subcutaneous tophi were found in 26 patients, and intraosseous tophi were detected radiologically in 35 patients.

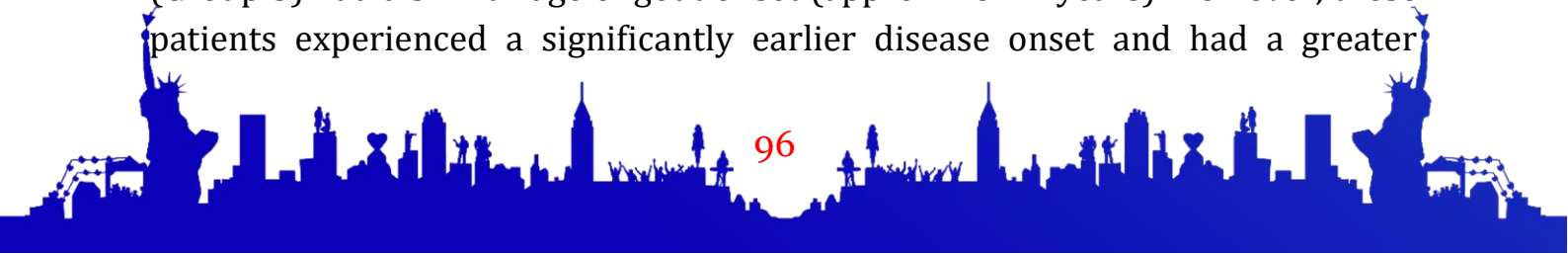
**Comorbidity Profile:** Comorbid conditions were highly prevalent. The distribution across groups was: Group 1 (41.3%), Group 2 (26.7%), and Group 3 (32%). Chronic kidney disease (CKD) was diagnosed in 32% of all patients. Patients in Groups 2 and 3 (with organ damage) had a significantly higher number of affected joints and a higher disease severity index compared to Group 1 ( $p < 0.05$ ). The presence of tophi was significantly more common in Groups 2 and 3 ( $p < 0.01$ ).

**Renal Involvement Analysis:** Among the 24 patients with clinical signs of kidney damage, 16 had a recurrent disease course and 8 had a chronic course. The most common symptoms and conditions associated with renal damage were urolithiasis, dysuric symptoms, lumbar pain, macrohematuria, and arterial hypertension (AH), which was present in 70.8% of these patients.

• **Urinalysis:** Proteinuria was detected in 40% of all 75 patients, hematuria in 32%, and leukocyturia in 36%.

• **Ultrasound Findings:** Renal ultrasound revealed pathologies in 78.5% of patients. The most common findings were nephrolithiasis and renal cysts. Signs of pyelonephritis were suggested in 14 patients based on combined US and laboratory data.

**Comparative Analysis of Groups with Organ Damage:** Patients with gout and liver/kidney damage (Group 2) and those with gout and kidney damage (Group 3) had a similar age of gout onset (approx. 46-47 years). However, these patients experienced a significantly earlier disease onset and had a greater





number of affected joints compared to those without such complications ( $p < 0.001$ ). The frequency of gouty arthritis attacks in the last year was also significantly higher in these groups ( $p < 0.01$ ).

**Discussion.** The findings of this study highlight the severe and complex nature of gout when associated with renal and hepatic comorbidities. The high prevalence of CKD (32%), arterial hypertension, and dyslipidemia among the studied patients confirms that gout is not merely a joint disease but a systemic metabolic disorder.

The results demonstrate that patients with organ damage present with a more aggressive disease phenotype, characterized by an earlier onset, polyarticular involvement, a higher tophus burden, and more frequent acute attacks. This underscores the importance of recognizing these patients as a distinct subgroup requiring more intensive management.

The renal ultrasound findings, which identified pathology in 78.5% of patients, prove to be a highly sensitive tool (93% accuracy in this context) for diagnosing gouty nephropathy, often revealing subclinical damage. The high frequency of urolithiasis and other structural changes emphasizes the need for routine renal monitoring in all gout patients.

**Limitations:** The sample size, particularly of the subgroups, is a limitation. Furthermore, the genetic analysis mentioned in the broader context was not detailed in the results provided for this cohort.

**Conclusion.** This study provides a comprehensive clinical profile of patients with gout and associated renal and hepatic damage. The key conclusions are:

1. Gout patients with comorbid kidney and/or liver damage exhibit a more severe disease course.
2. Arterial hypertension, dyslipidemia, and a longer disease duration are key risk factors and drivers of complications.
3. A comprehensive diagnostic approach, including thorough laboratory work-up and renal ultrasound, is essential for early detection of organ damage.
4. Management must extend beyond urate-lowering therapy to include aggressive control of comorbidities, weight management, and lifestyle modifications to improve long-term outcomes and quality of life.

A targeted, multifaceted treatment strategy is therefore mandated for this high-risk patient population to reduce the frequency of attacks, slow disease progression, and mitigate the accumulation of risk factors associated with life-threatening cardiovascular and renal events.





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