

**Ч. Сони, Х.К. Рават**

**ОЦЕНКА ФУНКЦИИ ПОЧЕК У ПАЦИЕНТОВ С ФИБРИЛЛЯЦИЕЙ  
ПРЕДСЕРДИЙ НА ФОНЕ ГИПЕРУРИКЕМИИ**

*Научный руководитель: канд. мед. наук, доц. С.С. Лемешевская  
Кафедра внутренних болезней, гастроэнтерологии и нутрициологии с курсом  
повышения квалификации и переподготовки  
Белорусский государственный медицинский университет, г. Минск*

**C. Soni, H.K. Rawat**

**ASSESSMENT OF RENAL FUNCTION IN PATIENTS WITH ATRIAL  
FIBRILLATION IN CONTEXT OF HYPERURICEMIA**

*Tutor: PhD, associate professor S. S. Lemiasheuskaya  
Department of Internal Medicine, Gastroenterology and Nutrition with Training  
and Advanced Training Courses  
Belarusian State Medical University, Minsk*

**Резюме.** Фибрилляция предсердий (ФП) часто сочетается с гиперурикемией и подагрой, что усугубляет течение заболевания за счёт общих факторов риска – артериальной гипертензии, ожирения и патологии почек. В данном исследовании была проведена оценка функции почек у пациентов с ФП в сочетании с гиперурикемией и подагрой. Проанализированы 28 историй болезни пациентов из кардиологического отделения 3-й городской клинической больницы им. Е.В. Клумова, г. Минск. Показано, что у пациентов с ФП и подагрой наблюдались более низкие показатели скорости клубочковой фильтрации (СКФ), более высокие значения индекса массы тела (ИМТ) и отличия в уровнях С-реактивного белка (CRP) по сравнению с пациентами с изолированной ФП и ФП с гиперурикемией. Полученные данные подчеркивают важность мониторинга функции почек и коррекции метаболических нарушений у данной категории пациентов, особенно с сопутствующей подагрой.

**Ключевые слова:** фибрилляция предсердий, гиперурикемия, подагра, функция почек, скорость клубочковой фильтрации, С-реактивный белок, индекс массы тела, сердечно-сосудистый риск

**Resume.** Atrial fibrillation (AF) is often associated with hyperuricemia and gout, which complicates disease management due to shared risk factors such as hypertension, obesity, and renal dysfunction. This study evaluated renal function in patients with AF coexisting with hyperuricemia and gout. A total of 28 medical case histories from the Cardiology Department of E.V. Kloumov 3rd City Hospital, Minsk, were analyzed. The study demonstrated that patients with AF and gout had lower glomerular filtration rate (GFR) values, higher body mass index (BMI), and significant differences in C-reactive protein (CRP) levels compared to those with isolated AF and AF with hyperuricemia. These findings emphasize the importance of monitoring kidney function and managing metabolic abnormalities in this patient group, particularly in those with concurrent gout.

**Keywords:** atrial fibrillation, hyperuricemia, gout, renal function, glomerular filtration rate, C-reactive protein, body mass index, cardiovascular risk

**Relevance.** Atrial fibrillation (AF) is one of the most common cardiac arrhythmias, significantly increasing the risk of stroke, thromboembolic complications, and cardiovascular mortality. The coexistence of hyperuricemia and gout in patients with AF worsens the disease course by contributing to reduced renal function, enhanced inflammatory processes, and increased cardiovascular risk. Given the high prevalence of

these comorbid conditions and their impact on patient outcomes, timely identification of renal dysfunction and correction of metabolic abnormalities in AF patients is a relevant issue in modern cardiology. Conducting such studies is essential for optimizing preventive and therapeutic strategies in high-risk patient groups.

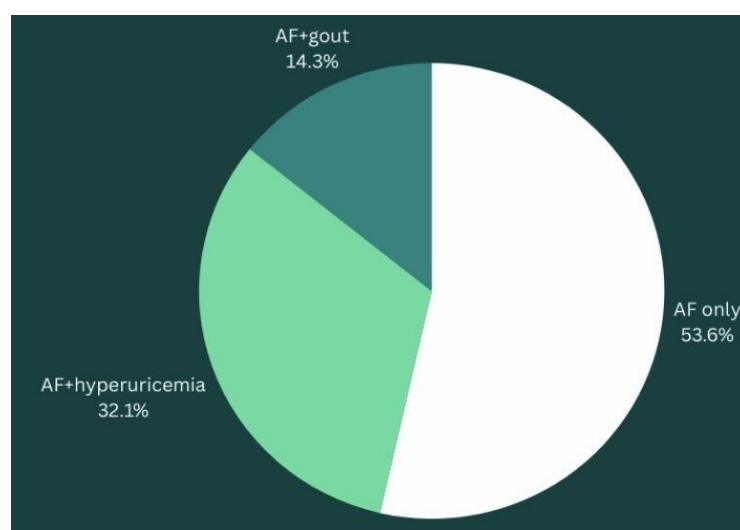
**Abstract.** Hyperuricemia often found associated with atrial fibrillation is now identified as a comorbidity in patients with atrial fibrillation (AF). Elevated serum uric acid has been associated with atrial remodelling and increased AF risk. The coexistence of gout and AF complicates since both conditions share common risk factors such as hypertension, obesity, and renal disorders, raising the risk of thromboembolic events and cardiovascular morbidity. Understanding and managing gout in AF patients is important for overall cardiovascular risk reduction.

**Goal:** to examine renal function of patients with atrial fibrillation with co-existing gout and hyperuricemia.

**Materials and methods.** Patient case histories diagnosed with A-fib in Minsk City Hospital No. 3 from 2024 to date were obtained. Scientific articles from PubMed and Google Scholar in time period 2014-2025 were analysed.

**Results and their discussion.** 15 patients with AF (mean body mass index (BMI)= $32.46 \pm 5.99$ ), 9 patients with AF with hyperuricemia (mean BMI= $31.19 \pm 2.89 \text{ kg/m}^2$ ), 4 patients with AF and gout (mean BMI= $36.75 \pm 3.38 \text{ kg/m}^2$ ),

When we compared GFR in these we found weak differences in Group1 [50.4(46.00, 56.00) ml/min] and Group2 [51.50 (46.00; 56.00) ml/min] whereas astatistically significant differences ( $p=0.04$ ) were found in comparisons done in GFRlevels of the groups with isolated AF [51.50 (46.00; 56.00) ml/min], with the group with AF and Gout [26.50 (19.00; 34.00) ml/min]; CRP levels on day 2 between groups with AF and gout [5.15 (4.37, 5.75) mg/ml] and AF with hyperuricemia [26.89 (23.60, 42.50) mg/ml] ( $p=0.03$ ); CRP levels on day 2 between groups of isolated AF [18.7(3.10, 20.4) mg/ml] and AF with hyperuricemia [26.89 (23.60, 42.50) mg/ml] ( $p= 0.04$ ; between BMI of groups with AF and gout [36.15(34.32, 39.17)] and AF with hyperuricemia [31.63(29.05, 32.9)] ( $p=0.01$ )



**Fig. 1** – Proportion of cases with each diagnosis

The comparison of glomerular filtration rate (GFR) revealed no statistically significant difference between Group 1 vs. Group 2(a) and Group 2(a) vs. Group 2(b). However, GFR was significantly lower in Group 2(b) vs. Group 1 ( $p = 0.04$ ).

**Tbl. 1.** Comparison of GFR (ml/min) amongst the groups studied

Group	Median	Lower; Upper Quartile
1	51.5	(46; 56)
2(a)	52	(46; 54)
2(b)	26.5	(19; 34)

CRP levels on day 2 were significantly lower in Group 2(b) vs. Group 2(a) ( $p=0.03$ )

**Tbl. 2.** CRP (mg/ml) levels on day 2 of all groups

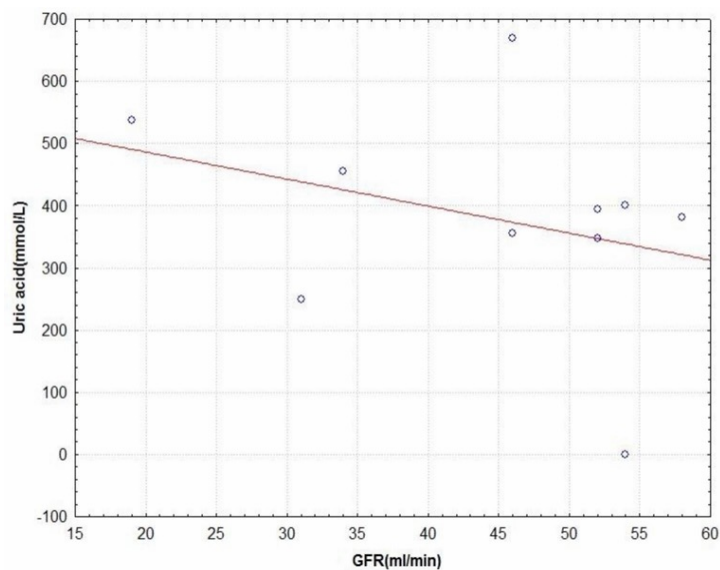
Group	Median	Lower; Upper Quartile
1	18.7	(3.1; 20.4)
2(a)	26.89	(23.6; 42.5)
2(b)	5.15	(4.37; 5.75)

Obesity (BMI comparisons). Group 2(b) patients exhibited significantly higher BMI values compared to Group 2(a) ( $p=0.01$ )

**Tbl. 3.** BMI (kg/m<sup>2</sup>) of all groups studied

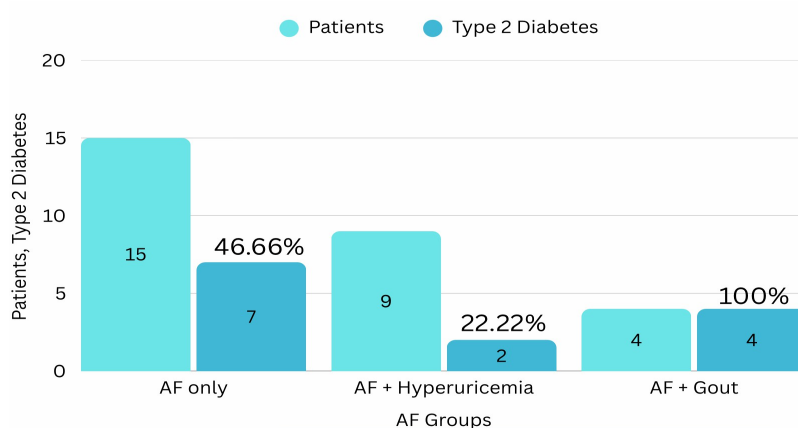
Group	Median	Lower; Upper Quartile
1	32.29	(27.77; 36.05)
2(a)	31.6	(29.05; 32.9)
2(b)	36.15	(34.32; 39.17)

Moreover, a Scatter Plot illustrated between GFR and serum uric acid levels showed a **negative correlation**, indicating that impaired renal function contributes to hyperuricemia.



**Fig. 2** – Correlation of GFR vs Uric acid levels

Furthermore, a Chi-square analysis showed that diabetes is statistically significant in patients with gout co-existing with AF ( $\chi^2 = 6.74; p=0.01$ )



**Fig. 3** – Incidence of diabetes amongst the groups

**Conclusion.** The study highlights that patients with atrial fibrillation (AF), particularly those with coexisting gout had reduced renal function and since these patients demonstrated higher BMI values which reflected excessive obesity compared to those with isolated AF indicating compromised renal function, which may further contribute to renal impairment and increased cardiovascular risk emphasizing the importance of monitoring kidney function and managing metabolic factors in AF patients, especially those with gout.

These findings highlight the need for further research with large sample size for preventive strategies.

#### Literature

1. Knuiman M, Briffa T, Divitini M, et al.: A cohort study examination of established and emerging risk factors for atrial fibrillation: the Busselton Health Study. *Eur J Epidemiol.* 2014; 29(3): 181–90.
2. Ridker PM: Inflammation, C-reactive protein, and cardiovascular disease: moving past the marker versus mediator debate. *Circ Res.* 2014; 114(4): 594–5.

3. Tse G, Wong CW, Gong M, et al.: Predictive value of inter-atrial block for new onset or recurrent atrial fibrillation: A systematic review and meta-analysis. *Int J Cardiol.* 2018; 250: 152–56.
4. Abbott RD, Brand FN, Kannel WB, Castelli WP. Gout and coronary heart disease: the Framingham Study. *J Clin Epidemiol* 1988;41:237–42. [DOI] [PubMed] [Google Scholar]
5. Krishnan E. Gout and the risk for incident heart failure and systolic dysfunction. *BMJ Open* 2012;2:e000282. [DOI] [PMC free article] [PubMed] [Google Scholar]