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Prevalence of Hyperuricemia in the Cardiology Department of the Gabriel Touré University Hospital

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Abstract

Uric acid (UA) is considered a true cardiovascular risk factor. Hyperuricemia is defined as a serum UA concentration > 70 mg/L or 420 µmol/L and occurs when UA production exceeds its excretion. The objective of our study was to investigate hyperuricemia in the cardiology department of the Gabriel Touré University Hospital. **Methods:** This was a descriptive and analytical cross-sectional study conducted over a 3-month period from May 1 to July 31, 2025, in the cardiology department of the Gabriel Touré University Hospital in Bamako. It included all patients aged 17 years or older who were seen in consultation and/or hospitalized and who consented to participate in the study. Patients who were unable to undergo serum uric acid testing were excluded. Data collection was carried out using a survey form including sociodemographic, clinical, and paraclinical data. Data entry and analysis were performed using SPSS version 25.0, and the chi-square test was used for statistical analysis. **Results:** During the study period, 629 patients were seen or hospitalized. Among them, 200 patients underwent serum uric acid testing, and 114 had hyperuricemia, representing a hospital frequency of 57%. The age group ≥ 60 years was the most represented (44%), and uric acid levels were higher in this group (47.4%), although the difference was not statistically significant (p = 0.707). Females were the most represented (67%; n = 134), with a male to female ratio of 0.49. Hyperuricemia was more frequent in women (60.5% vs. 39.5%; p = 0.025), with a statistically significant association between hyperuricemia and sex. **Conclusion:** The frequency of hyperuricemia is not negligible in our department, hypertension and sedentary lifestyle were highly prevalent cardio-

vascular risk factors in our population, and however, their association with hyperuricemia was not statistically significant.

Keywords

Uric Acid, Hyperuricemia, Cardiovascular Risk Factor, Gabriel Touré University Hospital, Bamako

1. Introduction

Uric acid (UA) is considered a true cardiovascular risk factor [1]. Hyperuricemia is defined as a serum UA concentration > 70 mg/L or 420 µmol/L and occurs when UA production exceeds its excretion [2]. The kidney plays a major role in UA excretion, eliminating approximately 70% of the UA produced daily, while the remaining 30% is excreted through the intestine [3]. The prevalence of hyperuricemia is estimated at around 18% in the general population [4]. In Western countries, hospital-based studies and population surveys have helped establish an epidemiological profile of hyperuricemia, with prevalence ranging from 15% - 20% in men and 2% - 10% in women [4]. In South Africa, a study on the clinical and genetic aspects of gout among Black South Africans reported a hyperuricemia prevalence of 96% in the study population [5]. In 2018, a study on the biochemical aspects of hyperuricemia and gout attacks in the adult population of southeastern Gabon found a hyperuricemia prevalence of 30.6% in the study population [6]. Koné *et al.* showed that patients with cardiovascular diseases and higher mortality had significantly elevated uric acid levels [7]. Given the scarcity of studies on hyperuricemia in the field of cardiology in Africa, particularly in Mali, and considering that recent studies have demonstrated that hyperuricemia is a cardiovascular risk factor (CVRF), it appeared relevant to conduct this study in the cardiology department of the Gabriel Touré University Hospital.

2. Methodology

This was a descriptive and analytical cross-sectional study conducted from May 1 to July 31, 2025, in the cardiology department of the Gabriel Touré University Hospital. It included all patients aged 17 years or older who attended outpatient consultations and/or were hospitalized during the study period. Patients who were unable to undergo serum uric acid testing were excluded. Data were collected using a survey form including sociodemographic, clinical, and paraclinical data. Data entry and analysis were performed using SPSS version 25.0, and the chi-square test was used for statistical analysis.

Hyperuricemia was defined as:

Serum uric acid > 420 µmol/L in men;

Serum uric acid > 360 µmol/L in women.

Quantitative data were presented as mean ± standard deviation, and qualitative data as proportions.

3. Results

During the study period, 629 patients were seen in consultation or hospitalized. Among them, only 200 patients underwent serum uric acid testing, and 114 had hyperuricemia, corresponding to a hospital prevalence of 57%.

The 200 tested patients were selected from those who, on the one hand, agreed to participate in the study and, on the other hand, consented to undergo serum uric acid testing. Uric acid testing was performed systematically in this group. The remaining patients were not tested because some did not agree to participate in the study, while others lacked the financial means to undergo uric acid testing.

The mean serum uric acid level was 417 ± 163 µmol/L, with extremes ranging from 112 to 971 µmol/L. Patients' ages ranged from 17 to 90 years, with a mean age of 54 ± 16.7 years. The ≥ 60-year age group was the most represented with 44% (Table 1). Females were the most represented (67%; n = 134), with a male-to-female ratio of 0.49 (Figure 1). Housewives were the most represented occupational group with 54.5% (Figure 2). Most patients were from urban areas (82.5%) (Figure 3). Sedentary lifestyle and hypertension were the most common cardiovascular risk factors, with frequencies of 95.5% and 81.5%, respectively (Table 2). Red meat consumption and diuretic use were the predominant risk factors for hyperuricemia, with frequencies of 54.5% and 42.5%, respectively (Table 3). Hyperuricemia was the most frequent biological abnormality (57%), followed by hypercreatininemia and dyslipidemia (29% each) (Table 4). Serum uric acid levels were higher in the ≥ 60-year age group (47.4%), but without statistical significance (p = 0.707). Hyperuricemia was more frequent in women (60.5% vs. 39.5%). However, there was a statistically significant association between hyperuricemia and sex (p = 0.025); men had twice the risk of developing hyperuricemia compared to women (RR = 2.019; 95% CI [1.087 - 3.748]; p = 0.025). Hypertension and sedentary lifestyle were highly prevalent cardiovascular risk factors in our population, but their association with hyperuricemia was not statistically significant. A significant association was found between serum uric acid levels and reduced left ventricular ejection fraction (LVEF) (p = 0.0001). Regarding personal history, a history of hyperuricemia was positively correlated with hyperuricemia (p = 0.001). Among comorbidities, only chronic kidney disease (CKD) stages 2 and 4 were positively correlated with hyperuricemia (p = 0.019 and p = 0.012, respectively).

Table 1. Distribution by age group.

Age Group (years)	Number (n)	Percentage (%)
<30	20	10
30 - 44	34	17
45 - 59	58	29
≥60	88	44
Total	200	100

Table 2. Distribution according to cardiovascular risk factors.

CV Risk Factors and Comorbidities	Number (n = 200)	Percentage (%)
Hypertension	163	81.5
Diabetes	19	9.5
Dyslipidemia	17	8.5
Current smoker	25	12.5
Obesity	37	18.5
Sedentary life style	191	95.5

Table 3. Distribution according to risk factors for hyperuricemia.

Risk Factors for Hyperuricemia	Number (n = 200)	Percentage (%)
Red meat consumption	109	54.5
Diuretics	85	42.5
Egg consumption	52	26
Obesity	36	18
Low-dose aspirin	33	16.5
History of hyperuricemia	17	8.5
Others	8	4

Others: Pyrazinamide (1.5%), Ethambutol (1.5%), Anticancer drugs (1%).

Table 4. Distribution according to biological abnormalities.

Biological Parameter	Number (n = 200)	Percentage (%)
Hyperuricemia	114	57
Hypercreatininemia	58	29
Dyslipidemia	58	29
Anemia	46	23
Electrolyte imbalance	50	25
Hyperglycemia	23	11.5

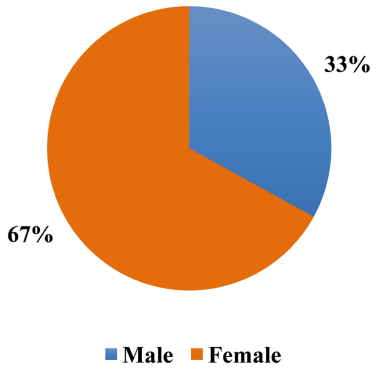

Figure 1. Distribution by sex.

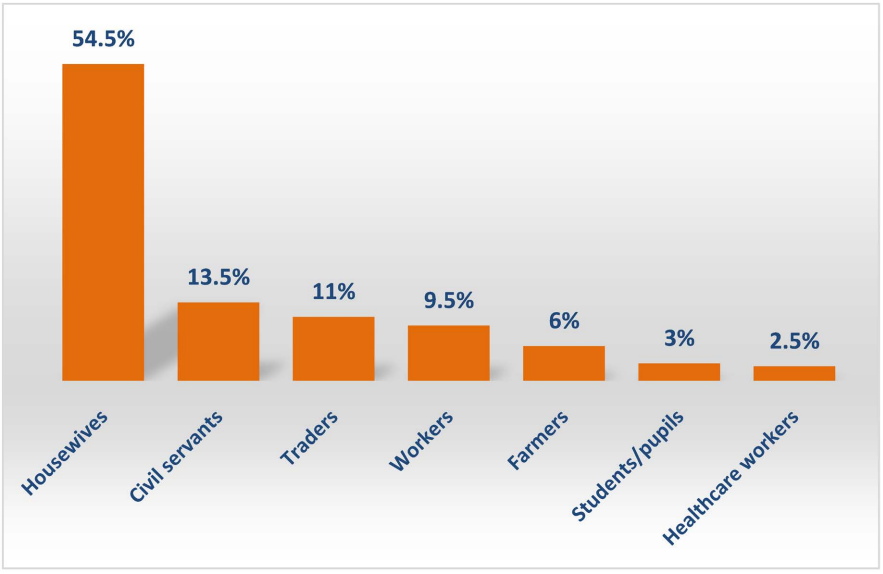

Figure 2. Distribution by occupation.

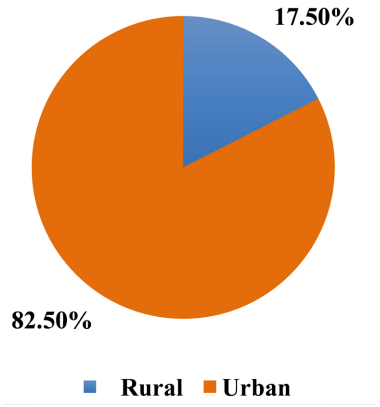

Figure 3. Distribution by place of residence.

4. Discussion

Study limitations:

Limited financial resources among some included patients prevented the completion of additional investigations necessary to determine parameters associated with hyperuricemia.

In this study, the prevalence of hyperuricemia was 57%. El Aissaoui [5] in France (53%) and Habak *et al.* [6] in Algeria (50%) reported results comparable to ours. In contrast, Kone *et al.* [7] in Côte d'Ivoire (29.4%) and Lamine [8] in Algeria (35.8%) reported lower prevalences, while higher prevalences were found by Hamidou Oumar [9] in Mali (66.7%) and Cécile [10] in France (64.2%). Variations in prevalence across studies may be explained by differences in the definition thresholds of hyperuricemia and the characteristics of the study populations. The sex distribution of our sample showed that 67% (n = 134) were female and 33% (n = 66) were male, with a male-to-female ratio of 0.49. Hyperuricemia was more frequent

in women (60.5% vs. 39.5%). However, there was a statistically significant association between hyperuricemia and sex (p = 0.025). Men had twice the risk of developing hyperuricemia compared to women (RR = 2.019; 95% CI [1.087 - 3.748]; p = 0.025). Our results are consistent with those of Habak [6], who found a sex ratio of 0.42, and Lamine [8], who reported a sex ratio of 0.56 with female predominance (40.2% vs. 27.8%) but without statistical significance (p = 0.127). Similarly, Hamidou Oumar [9] reported a sex ratio of 0.76 with female predominance (56.9% vs. 43.1%), also without statistical significance (p = 0.11). The mean age of patients was 54 ± 16.7 years, with the ≥ 60-year age group being the most represented (44%). This is comparable to Hamidou Oumar [9], who reported a mean age of 56.35 ± 12.82 years, and Ogbera & Azenabor [11] in Nigeria, who found a mean age of 59.9 ± 10.3 years. In contrast, Doualla *et al.* [12] in Cameroon reported a lower mean age of 49.5 ± 13.9 years. Serum uric acid levels were higher in patients aged ≥ 60 years (47.4%), although this was not statistically significant (p = 0.707), similar to the findings of Hamidou Oumar [9], who reported 68% in the ≥ 61-year age group (p = 0.87). Sedentary lifestyle and hypertension were the most frequent cardiovascular risk factors, with prevalences of 95.5% (n = 191) and 81.5% (n = 163), respectively. The comparison of the presence or absence of hyperuricemia according to each cardiovascular risk factor did not show statistically significant differences. Similarly, El Aissaoui [5] found that the presence of hypertension or diabetes was associated (non-significantly) with higher uric acid levels. In contrast, Cécile *et al.* [10] and Jiao Wang *et al.* [13] reported that hypertensive patients had significantly higher rates of hyperuricemia (72.1% and 89.2%, respectively; p = 0.02 and p = 0.001). Comparison of hyperuricemia according to specific risk factors showed statistically significant differences in patients with a history of hyperuricemia and in those using diuretics or aspirin (p = 0.001; p = 0.0001; p = 0.002). Our findings are consistent with the literature. Bruderer *et al.* [14] reported that diuretics increase the risk of hyperuricemia by 2.64 (95% CI: 2.47 - 2.83), 1.70 (95% CI: 1.62 - 1.79), and 2.30 (95% CI: 1.95 - 2.70) for loop diuretics, thiazide diuretics, and related agents, respectively. Zhang *et al.* [15] showed that low-dose aspirin reduces renal excretion of uric acid. In our study, stages 2 and 4 of chronic kidney disease (CKD) were significantly associated with hyperuricemia (p = 0.019 and p = 0.012). Cécile *et al.* [10] reported similar findings (p < 0.03). This association may be explained by the potential pathogenic role of hyperuricemia on the kidneys, particularly through the induction of glomerular hypertension [16]. Regarding left ventricular ejection fraction (LVEF), there was a significant association with hyperuricemia. In patients with reduced LVEF, the risk was five times higher (RR = 5.274; 95% CI [1.943 - 14.320]; p = 0.0001), consistent with the findings of El Aissaoui *et al.* [5] p < 0.05.

5. Conclusion

Hyperuricemia has a high prevalence and is associated with several parameters. Patients with heart failure and reduced LVEF, as well as those with chronic kidney

disease, had higher uric acid levels. Men had twice the risk of developing hyperuricemia. Serum uric acid measurement, a low-cost and accessible test, could serve as an additional tool in assessing the risk of cardiovascular events.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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