
Prevalence of Hyperuricemia (HU) in Arterial Hypertension

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To cite this article:

Bâ Hamidou Oumar, Menta Ichaka, Maiga Asmaou Kéita, Daou Adama, Diall Ilo Bella, Coulibaly Souleymane, Doumbia Coumba Thiam, Daffé Sanoussi, Sidibé Noumou, Sangaré Ibrahima, Millogo Georges Rosario Christian, Touré Mamadou, Sidibé Salimata, Diarra Mamadou Bocary. Prevalence of Hyperuricemia (HU) in Arterial Hypertension. *Science Journal of Clinical Medicine*. Vol. 4, No. 4, 2015, pp. 76-79. doi: 10.11648/j.sjcm.20150404.12

Abstract: Introduction: Hyperuricemia constitutes a risk for many organs and its prevalence is high ranging from 15-20% up to 35% in developing countries. HU relation to arterial hypertension was pointed out in the end of the XIX century and is recognized as independent cardiovascular risk factor. Thus HU is less studied in our environment which justifies our work to determine prevalence and with HU associated factors among hypertensive patients followed in the Cardiology department in the Mother Child Hospital “Le Luxembourg”. Methodology: It’s was a cross-sectional study in the Mother-Child Hospital “Le Luxembourg” in Bamako. All patients with complete labor tests were included making a sample of 51 hypertensive outpatients seen from July 2010 to January 2011. For any included patient, socio-demographic and biological variables were collected. In the same way a chest radiography, an ECG and an echocardiography were realized. Patients were asked about their knowledge about HU Hyperuricemia was defined as an uricemia > 420 $\mu\text{mol/l}$ for men and 360 $\mu\text{mol/l}$ for women. Microsoft Excel 2007 was used to gather data and SPSS version 12 to perform analyzes. Results: Mean age of the sample was 56,35 years, the sex-ratio Male: Female 0,76. Hyperuricemia, hypercreatininemia and hyperglycemia were found respectively in 66,7,33,3% and 23,5% of the cases. 78,4% of the patients had stated to have heard about hyperuricemia, 27,5% knew their hyperuricemia. The socio-demographic characteristics did not present a statistically significant difference. Conclusion: Hyperuricemia as a cardiovascular risk factor, had to be researched and managed more aggressively. The very high proportion of patients with a hyperuricemia requires to detect it among hypertensive patients, to carry out an early treatment and thus to reduce the cardiovascular risk of the patient.

Keywords: Hypertension, Hyperuricemia, Cardiology, Bamako

1. Introduction

Hyperuricemia is a frequent biochemical anomaly, resulting from an excessive production of urate and/or a decreased renal excretion of uric acid. The risk of development of a gout is increased for concentrations higher than 600 $\mu\text{mol/l}$ [1,2].

It constitutes a risk for many organs [3-7]. The prevalence of HU is from 15-20% by men and 5-10% among women [8],

can even reach 35% by man and 8,7% by woman in the developing countries [9].

A relation between the uric acid (UA) and arterial hypertension (HT) was evoked already in the end of the XIX century [9-11].

If certain great studies minimized the role of the HU in the arterial HT [12], today HU is recognized as independent

cardiovascular risk factor [4, 13].

The relative risk to develop an HT increases with the uricemia, HT incidence increases approximately 7% for each increase of 14 mg/l (83 $\mu\text{mol/l}$) of uricemia (ARIC study), for each increase of 60 $\mu\text{mol/l}$ of uricemia, the relative cardiovascular risk was 1,09 in man and 1,26 in woman (study NHANES). In the same way an association between serum uric acid and cardiovascular events in hypertensive women was supported, and a reduction of serum uric acid may be due by specific medicament [11].

Little is known about HU in our working environment so that this condition need to be explored and motivated this work that tries to determine the prevalence and with HU associated factors among hypertensive patients followed in the service with Cardiology with the Hospital Mother Child "Luxembourg", is the reason for this work.

2. Methodology

The cross-sectional study was performed in the Mother-Child Hospital "Le Luxembourg" from July 2010 to January 2011

All hypertensive outpatients seen in the Mother-Child Hospital and with full clinical and labor tests data were included.

HT patients with incomplete labor tests were not included.

For any included patient, socio-demographic, cardiovascular risk factors, clinical data and biological variables were collected.

Body mass index (BMI) was calculating using weight in Kg and height in m as $\text{weight}/\text{height}^2$. Overweight, Obese and underweight were defined as BMI resp. $\geq 25 \text{ Kg/m}^2$, $\geq 30 \text{ Kg/m}^2$ and $< 18,5$.

In the same way data on chest radiography, electrocardiogram (ECG) and an echocardiography were realized.

HU was defined as a serum uric acid level $> 420 \mu\text{mol/l}$ for men and $360 \mu\text{mol/l}$ for women.

A qualitative appreciation (normal or anormal) was used

for uric acid, glycemy, serum creatinine as well for radiographic, electrocardiographic and echocardiographic data. study.

Further patients were asked about their knowledge about HU using 5 questions:

- Have you heard about hyperuricemia
- Do you have an hypericemia?
- If yes how long ?
- Do you take medication against hyperuricemia ?
- If yes which medications?

Microsoft Excel 2007 was used to gather data and SPSS version 12 to perform analyzes.

Analyzes were performed in 2 stages : a first descriptive part and a second analytic part.

Significantly were tests for a p-value of less than 0,05

Patients had to freely choose to be included or not without any consequence about their further management.

3. Results

3.1. Descriptive Study

The sample size was 51 hypertensive patients, with an mean age of 56,35 years and an mean duration of HT of 10,73 months. The others characteristics of the sample are shown in Table 1.

Patients aged from 46 - 60 and those over 60 years represented the majority with respectively 39,2%,37,3% and the sex ratio Male: Female was 0,76 (Table 2).

47,1% had HT diagnosed for less than 6 months, Diabetes and Gout were found in respectively 15,7% and 5,9%. Cardiac disease was found in 3,9% of all cases and obese patients made 41,2% of the sample (Table 3).

HU, high serum creatinine and hyperglycemia were found respectively in 66,7,33,3% and 23,5% of all cases, while 27,5% had a cardiomegaly on chest radiography and 92,2% a pathological echocardiography (Table 4).

78,4% of the patients had stated to have heard about HU, 27,5% knew their hyperuricemic condition.

Table 1. sample characteristics of 51 hypertensive patients with HU.

Variables	Minimum	Mean	Maximum	standard Deviation
Age	28,00	56,35	79,00	12,82
HT duration(months)	1,00	10,73	40,00	9,65
Weight (Kg)	45,00	82,53	125,00	19,73
Height (cm)	145,00	163,73	190,00	8,39
BMI* (Kg/m ²)	16,53	30,84	48,07	7,15
Systolic pressure (mmHg)	100,00	163,14	240,00	29,97
Diastolic pressure (mmHg)	70,00	98,02	169,00	14,74
HR** (/min)	45,00	85,90	116,00	16,96
Uricemia (mmol/l)	59,50	440,07	833,00	164,32

*: body mass index; ** Heart Rate

Table 2. socio-demographic variables distribution in the sample of 51 hypertensive patients with HU.

Variables		Number	Percentage
Age group (years)	< 30	2	2,0
	31-45	10	19,6
	46-60	20	39,2
	>= 61	19	37,3
Sex	Male	22	43,1
	Female	29	56,9
	Civil servant	13	25,5
Profession	Trader	5	9,8
	House wives	21	41,2
	Elderly person	6	11,8
	Other	6	11,8
Residence	Bamako	41	80,4
	Out of Bamako	10	19,6

Table 3. Medical history and cardiovascular risk factor distribution in the sample of 51 hypertensive patients with HU.

Variables		Number	%
HT duration (months)	< 6	24	47,1
	7-12	11	21,6
	13-18	1	2,0
	> 18	15	29,4
BMI	Underweight	13	25,5
	Normal	5	9,8
	Obese	21	41,2
Diabetes mellitus	Overweight	12	23,5
	No	43	84,3
	Yes	8	15,7
Gout	No	48	94,1
	Yes	3	5,9
Heart disease	No	49	96,1
	Yes	2	3,9
Others*	Yes	31	60,8
	No	20	39,2

*Gastro-duodenal ulcer, Asthma bronchiale, functional Colopathy

Table 4. Labor tests data evaluation in the sample.

Variables		N	%
Uricemia	Anormal	34	66,7
	Normal	17	33,3
Creatininemia (n=47)	Normal	30	63,8
	Anormal	17	36,2
Glycemia (n=44)	Normal	32	72,7
	Anormal	12	27,3
CTI* (n=30)	Normal	16	53,3
	Anormal	14	46,7
ECG** (n=51)	Normal	29	56,9
	Pathological	22	43,1
Echographie cardiaque	Pathological	47	92,2
	Normal	04	07,8

* Cardio-thoracic index **Left ventricular hypertrophy

3.2. Analytical Study

The socio-demographic variables did not present a statistically significant difference. HU seemed more prevalent among female sex, in the age group ≥ 61 years and among Housewives with respectively 75,9% ($p=0,11$), 68,4% ($p=0,87$) and 71,4% ($p=0,98$).

HU was found in 83,3% among obese patients ($p=0,64$), 64,1% of the sedentaries ($p=0,48$) and 83,3% of the diabetes

patients ($p=0,25$).

71,4% of the patients having a cardiac enlargement and 54,5% with a left ventricular hypertrophy had an HU ($p=0,39$ respectively 0,11) (Table 5).

We did not find in the sample patients presenting an anomaly of LDL-Cholesterol or triglycerides.

Table 5. HU associated factors in the sample.

Variables		HU		P
		No	Yes	
Age (years)	< 30	0,0	100,0	0,87
	31-45	40,0	60,0	
	46-60	35,0	65,0	
	≥ 61	31,6	68,4	
Sex	Male	45,5	54,5	0,11
	Female	24,1	75,9	
	Civil servant	38,5	61,5	
Profession	Trader	40,0	60,0	0,98
	House wives	28,6	71,4	
	Elderly person	33,3	66,7	
	Other	33,3	66,7	
	Underweight	100,0	0,0	
	Normal	37,5	62,5	
	Overweight	26,7	73,3	
BMI*	Obese	40,0	60,0	0,64
	Morbid Obese	16,7	83,3	
Sedentarity	No	25,0	75,0	0,48
	Yes	35,9	64,1	
Diabetes mellitus	No	34,4	65,6	0,25
	Yes	16,7	83,3	
Cardiomegaly	No	43,8	56,3	0,39
	Yes	28,6	71,4	
ECG**	Normal	24,1	75,9	0,11
	Abnormal	45,5	54,5	

* Body mass index, ** Electrocardiogram

4. Discussion

Our study was realized on a sample of adults patients with a mean age of 56,35 years.

HU prevalence was 66,7% (75,9% in female sex and 35,3% in male sex) which is consistent with literature data ranging from 25 to 75% [10,15] and the HU is considered as cardiovascular risk factor [9-11, 13-14], requiring a more aggressive management of patients having an HU.

The mean uricemia was 440,067 (413,01 in female and 475,73 in male).

We did not find a statistically significant difference in age groups, sex and profession.

HU is generally associated with others metabolic disorders [4,9,16,17]. We could not highlight such relations, probably because of relatively small size of our sample.

If HU was frequent in our sample (4) only 27,5% of the patients were informed about this anomaly even if 78,4% of the patients stated to have heard about HU. This fact underlines the ignorance of the cardiovascular risk factors and thus the difficulty related to their management and thus requires broader information of the patients on these factors.

In addition the high percentage of patients with an HU implies to seek it among HT patients and to avoid the potentiation of the cardiovascular risk factors.

The high proportion of HT patients with HU pointed out the need for large sample studies to better characterize HU.

5. Conclusion

Hyperuricemia as a cardiovascular risk factor had to be researched and managed more aggressively. The very high proportion of patients with a HU requires to detect it among hypertensive patients, to carry out an early treatment and thus to reduce the cardiovascular risk of the patient.

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