Risk Factors Associated With Hyperuricemia in Patients with Diabetes Type 2: About 190 Cases

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Abstract

Introduction: Hyperuricemia is common Type 2 diabetes at very high cardiovascular risk.

Objective: Evaluate the relationship between hyperuricemia and diabetes type 2, and determine its predictive factors in this population.

Patients and Methods: Retrospective study cross including 190 patients with diabetes type 2 hospitalized Service of Endocrinology of CHU Ibn Rushd Casablanca from January 2015 to December 2017. Hyperuricemia was defined as a serum uric acid concentration > 70 mg/L (men) and > 60 mg/L (women). The variables studied were the anthropometric measurements, cardiovascular factors (tobacco, hypertension, dyslipidemia), and degenerative complications (retinopathy, neuropathy, kidney failure, ischemic heart disease). The analyzes were performed by SPSS software.

Results: Hyperuricemia was found in 26.5\% of patients with a female predominance (76\%), an average age of 55.9 years, and an average age of 12.4 ans diabetes. The glycemic control was found in 84.6\% of cases with mean glycated hemoglobin 8.6\%.

Factors associated with hyperuricemia were the blood pressure in 86\% (p <0.05), dyslipidemia in 76.3\% of cases (p <0.001) with hypertriglyceridemia in 48.3\% of cases (p <0.02), and a hypoHDLémie 28\% (p <0.001). The age, obesity, smoking, and glycemic control were associated significantly with hyperuricemia.

The research of degenerative complications of hyperuricemia has objectified renal impairment (GFR between 15 and 60ml / min) chez 47\% (p <0.001), it was kind of moderate in 35.8\% (p <0.01) and severe in 5.1\% (p <0.02), ischemic heart disease was found in 34\% of cases (p <0.01).

Conclusion: In our study, hyperuricemia in type 2 diabetes is common in female patients, especially with hypertension, dyslipidemia, and renal failure. Other factors such as age, obesity, smoking is not associated with hyperuricemia in type 2 diabetics.

Keywords

Hyperuricemia, Metabolic Syndrome, Type 2 Diabetes, Uric Acid
Introduction
Type 2 diabetes accounts for about 90% of diabetes [1] its incidence is rising sharply, it has become a public health problem. The International Diabetes Federation (IDF) estimates that, globally, the number of diabetic to 382 million in 2013 and expected to increase that number to 592 million in 2035 [2]. Cardiovascular illnesses are the leading cause of death and disability among type 2 diabetes [1,2]. Hyperuricemia is a common Type 2 diabetes at very high cardiovascular risk and increasing the morbidity and mortality rates. Thus, the growing burden of long-term diabetes indicates that prevention is urgently needed, underscoring the need for early identification of modifiable risk factors [3-6].

Objective of the Study
Evaluate the relationship between hyperuricemia and diabetes type 2, and determine its predictive factors in this population.

Patients and Methods
Retrospective study cross including 191 patients with type 2 diabetes hospitalized in Endocrinology CHU Ibn Rushd service of Casablanca in January 2015 to December 2017. Hyperuricemia was defined as a serum uric acid concentration > 70 mg/L (men) and > 60 mg/L (women).

Collection and Analysis of Data:
• Patients admitted to the hospital for a day or uric acid assay was done systematically in asymptomatic patients.
• Data were collected from medical records of patients with a form of a farm and collected in an Excel table.
• Statistical analysis was performed using SPSS Version 22.0.

Variables Studied:
• Anthropometric measurements (weight, height, waist circumference, BMI).
• Cardiovascular factors (tobacco, hypertension, dyslipidemia).
• Degenerative complications (retinopathy, neuropathy, nephropathy, ischemic heart disease).

Were included in the study all patients with type 2 consultants were excluded patients followed for gout.

Results
The average age of patients was 53.9 years (27-80).

Hyperuricemia was found in 26.5% of patients with a female predominance (76%), an average age of 55.9 years, and an average age of 12.4ans diabetes. The glycemic control was found in 84.6% of cases with mean glycated hemoglobin 8.6%. The Table-1 shows the general characteristics of our patients:

The factors associated with hyperuricemia were hypertension in 86% of patients were (p <0.05), dyslipidemia in 76% of cases (p <0.001) with hypertriglyceridemia in 48.3% of cases (p <0.02) and hypHDLémie in 28% (p <0.001), renal failure (GFR between 15 and 60ml / min) 47% (p <0.001), it was of moderate type at 35.8% (p <0.01) and severe in 5.1% (p <0.02). Ischemic heart disease was found in 34% of cases (p <0.01). Age, obesity, smoking,
glycemic control, diabetic retinopathy, and diabetic neuropathy and were not significantly associated with hyperuricemia.

**Table-2** shows the prevalence of cardiovascular risk factors associated with hyperuricemia.

**Discussion**

The hyperuricemia is defined by serum levels of uric acid above the normal reference range (> 5.5 mg per deciliter (mg/dl) for children and greater than 7.2 to 6.0 mg/dl respectively men and adult women). Uric acid is a final enzyme product in the degradation of nucleotide purine. It can trap oxygen free radicals and protect erythrocyte membrane lipid oxidation [3,4]. Some studies have shown that hyperuricemia is a risk factor for CVD in the general population [7-13] and studies on laboratory animals have also shown that a high concentration of uric acid plays a causal role in SM [14,15]. Other studies have also indicated that a high level of uric acid predicts the development of MS [16]. A meta-analysis of nine studies including 20,891 patients with type 2 diabetes found that hyperuricemia is an independent predictor of vascular complications and cardiovascular mortality in patients with T2DM [17-19].

Although studies have shown that hyperuricemia was a risk factor for type 2 diabetes, the association between the two remains controversial [12-14]. Hyperuricemia may also indirectly affect the progression of diabetes [15,16] Its prevalence varies between 16.1% and 36.2% of cases [7,20]. Patients with diabetes have a prevalence of hyperuricemia higher compared to nondiabetic patients [13,21]. In our study, the prevalence of hyperuricemia was 26% of cases. It is strongly correlated with dyslipidemia including hypertriglyceridemia and hypoHDLémie, high blood pressure, which accords with the literature [22-24].

In the Egyptian case-control study conducted on 986 patients and divided into 3 groups. 352 with type 2 diabetes for less than 5 years, 384 patients with type 2 diabetes for more than 5 years, and 250 non-diabetic controls showed that 32% of patients with type 2 diabetes showed hyperuricemia. The increase in serum uric acid was correlated with high blood pressure, in the presence of albuminuria and renal insufficiency.
Conclusion

In our study, hyperuricemia in type 2 diabetes is common in female patients, especially with hypertension, dyslipidemia, and renal failure. Other factors such as age, obesity, smoking is not associated with hyperuricemia in type 2 diabetes. The hyperuricemia is also correlated to a greater prevalence of degenerative complications including diabetic retinopathy and ischemic heart disease.

Reference

[20] Jalal DI, Rivard CJ, Johnson RJ, Maahs DM,


