

HYPERURICEMIA AS A PREDICTOR OF CORONARY HEART DISEASE IN NON – INSULIN DEPENDENT DIABETES MELLITUS PATIENTS⁺

Abdulkareem Mohammed J.M ^{*}

Riyadh Hussein Wali^{**}

Abstract

This study investigated serum uric acid as a predictor of coronary heart disease in NIDDM patient . In this study , cardiovascular risk factor was determined in 100 patients (55 men and 45 women) with NIDDM aged 45 to 64 years at baseline .

The study shows that the incidence of CHD increases significantly by quartiles of serum uric acid levels (p 0.001) . High uric acid level (above the medium value of (295 μ mol /L) is significantly associated with the risk of CHD .

المستخلص

بحثت الدراسة الحالية إمكانية استخدام مستوى حامض اليوريك كدليل على مرض احتشاء عضلة القلب في مرضى السكري غير المعتمد على الأنسولين إذ تم تعيين عامل الخطورة القلبية الوعائية لمئة مريض (٥٥ رجلاً و ٤٥ امرأة) مصابين بمرض السكري غير المعتمد على الأنسولين ، تتراوح أعمارهم بين (٤٥ - ٦٤) سنة .

أظهرت الدراسة أن نسبة الإصابة بمرض احتشاء عضلة القلب قد ازدادت بشكل ملحوظ مع ارتفاع مستوى حامض اليوريك بالدم (P =0.001) إذ أن ارتفاع مستوى حامض اليوريك اعلى من المتوسط (295 μ mol /L) له علاقة معنوية مع خطر الإصابة بمرض احتشاء عضلة القلب .

Introduction

Serum uric acid (or more correctly, its monoanion uric acid at physiological PH value) has been thought to be in humans ametabolically inert end prouduct of purine metabolism. However , serum uric acid has been recently associated with insulin resistance[1,2].

Furthermore , in nondiabetic subjects an elevated level of uric acid has been shown to be an independent predicator of coronary heart disease CHD and total

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^{*}Lecturer/ Kut -Technical Institute

^{**}Asist Lecturer / Kut -Technical Institute

mortality[3,4,5,6]. Therefore , the researchers examined serum uric acid in a prospective study that included 100 patients with NIDDM .

Several previous studies have shown that subjects with NIDDM have two fold greater risk of all manifestations of atherosclerotic vascular disease including coronary heart disease , compared with non-diabetic subjects[7,8,9] .

Subjects and Methods

All diabetic patients in this study who need antidiabetic drug therapy receive it free of charge according to the Sickness Insurance Act . The researchers identified all diabetic patient aged 45 to 64 years who live in Kut city in Iraq. The study included 100 patients (55 men and 45 women) .

All labrotary specimens were drawn after 12 hrs. fasting, serum glucose was determined by glucose oxidase method (Boehringer) . Serum uric acid was measured with the use of an enzymatic colorimetric method (Amsr Division , Miles Laboratories) [10,11] .

The subjects were classified into two categories , according to the median of serum uric acid : low uric acid (< 295 Mmol /L) and high uric acid (> 295 Mmol /L) velel

Table (1) :characteristics of the study population according to the median value of serum uric acid .

	MEN		WOMEN	
Variable	Low uric acid (n=257)	High uric acid n=294	Low uric acid (n=251)	High uric acid n=295
Age,y	57.2 $\pm$ 0.3	57.3 $\pm$ 0.3	58.3 $\pm$ 0.3	59.7 $\pm$ 0.3
Body mass index, kg/m²	26.9 $\pm$ 0.3	29.5 $\pm$ 0.2	29.3 $\pm$ 0.3	31.7 $\pm$ 0.4
Previous CHD,%	5.8	6.8	3.6	7.0
Duration of Diabetes	8.5 $\pm$ 0.3	7.5 $\pm$ 0.2	8.1 $\pm$ 0.2	7.8 $\pm$ 0.3

Results

Table -1 : presents clinical characteristics of NIDDM patient by the median value of serum uric acid at baseline in the whole study population by gender .Men with high uric acid (>295 μ mol /L) were older and having more body mass index and having a history of previous of CHD with more duration of diabetes than those with low uric acid ,in the same time women with high uric acid (>295 μ mol /L) were also older and having more body mass index and having a history of previous of CHD with more duration of diabetes than those with low uric acid. At baseline,serum uric acid level was significantly correlated with the components of age (P<0.01) ,body mass index (P<0.001) and duration of diabetes (P<0.5) .

Figure -1 shows the incidence of coronary heart disease events (men and women combined) by quartiles of serum uric acid. Incidence of coronary heart disease increase with increased serum uric acid level (p < 0.001), and the threshold for

increased risk is close to the median value (295 $\mu\text{mol/L}$). The results are essentially similar when data were analyzed separately for men and woman .

Discussion

The study demonstrates the predictor of coronary heart disease events in patient with NIDDM . In univariate analysis the risk of CHD was increased two fold among NIDDM patient with high uric acid ($> 295 \mu\text{mol/L}$) compared with those with low uric acid. Elevated levels of Serum uric acid are due to either an increase in uric acid production or decrease in its excretion . Differences in dietary purine intake are unlikely to explain the association of hyperuricemia with CHD . Serum uric acid level has been reported to be inversely related to renal blood flow and directly to renal vascular resistance in both normotensive and hypertensive humans[12,13] .

Cappuccio et al [14], demonstrated that high uric acid level were independently associated with increased proximal tubular sodium reabsorption in men . This association is strikingly similar to ability of insulin to promote renal sodium reabsorption that has been suggested to be one of the reasons for high frequency of hypertension in metabolic syndrome and NIDDM[15] .The results are similar to the results of (Niskanen LK) [16] which show that uric acid level as a risk factor for cardiovascular and all-cause mortality in middle-aged men,while (Waring WS) [17] shows that hyperuricaemia does not impair cardiovascular function in healthy adults .

Conclusion

The study suggests that hyperuricemia is a strong predictor of coronary heart disease events in middle aged patient with NIDDM.

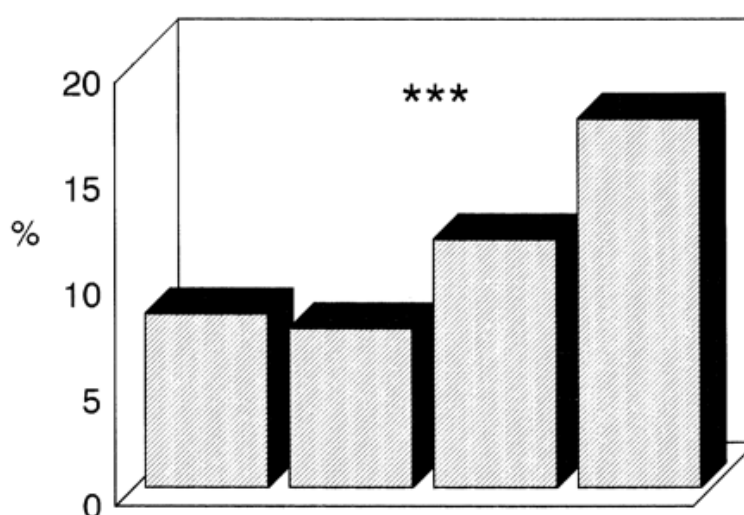


Figure - 1:- The percentage of coronary heart disease events with respect to the quartiles of serum uric acid concentration (expressed as micromoles per liter) (quartile limits : < 243 , $243 - 295$, $296 - 357$, and > 357). *** $P < 0.001$

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