Prevalence of hyperuricemia in diabetes mellitus

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Abstract

Objective :

To explore the prevalence of hyperuricemia in diabetes mellitus patients.

Design :

Eighty diabetic patients attended diabetic clinic center at teaching hospital in Najaf city between February and June 2006 were evaluated to explore the prevalence of hyperuricemia , thirty of them (group A) had joint
problems and fifty of them (group B) did not.

Result:

Ten patients (33%) from group A had hyperuricemia versus one (2%) from group B.

Conclusion:

Data from observation study suggest that there is correlation between joint problems and high serum uric acid in diabetes mellitus .

Introduction:-

Uric acid is produced from purines in the liver , which are mostly pass through the kidneys and is excreted in the urine , normally these processes keep the concentration of uric acid in the blood plasma at a healthy level , which is below 6.8 mg/dl[1].

Under certain circumstances , however ,the body produces too much uric acid or excretes too little . In either cases , concentration of uric acid increase in the blood. This condition is known as hyperuricemia [1´2`11].

Hyperuricemia is related to the individual components of the diabetes mellitus in complex ways .According to one theory , hyperuricemia enhances the effect of insulin resistance on renal urate absorption leading to glucose intolerance3'4'5'12'15 .

Hyperuricemia is associated with gout , but a minority of people develop it, when the serum is saturated with urate so that other disorders that produce gout-like symptom or causes hyperuricemia should be ruled out eg. pseudogout and septic arthritis 2,6. Hyperuricemia has long been suspected to be a cardiovascular risk factor especially in hypertension 4'7'13 that itself can induce hyperuricemia by decreasing renal flow , increasing urate reabsorption; or by the use of diuretic to control blood pressure8'9'14.

Patients and methods :-

The study was conducted on in-patients in Teaching Hospital in Najaf city during the period from February to June 2006 .

Thirty diabetic patients (group A) ranging in age between(26-80) years mean age (53) years with joint problems were intended into this study (8 of them male and 22 were female) versus fifty diabetic patients (group B) ranging in age between (18-80) years mean age(49) years . Thirty of them male and 20 were female without joint problems.

Patients were considered to have joint problems if they had joint pain , stiffness , limitation of movement and swelling.

A detailed history and thorough physical examination were performed for each diabetic patient especially looking for duration of diabetes , types of treatment , drugs history related to hyperuricemia , cardiovascular and renal complication .

Laboratory test which were done include the following:

1-fasting blood sugar (mmol/l).

2- blood urea and serum creatinine (mmol/l).

3- serum uric acid (mg/100ml).

Uremic patients and those with history of drug-related hyperuricemia were excluded from the study .

Data obtained were analysed by *chi* square and *p*- value <0.05 was considered significant.

Result:-

In group(A) , ten patients (33%) were found to have hyperuricemia ,where as in group(B) only one patient (2%) was

found to have hyperuricemia , this was statistically significant (P. value <0.05) . Table I, figure(A).

Nineteen patients (63%) in group (A) had a cardiovascular disease in a form of hypertension or ischemic heart disease compared with thirteen patients (26%) in group(B) had a cardiovascular disease which was statistically significant. Table II , figure (B).

Six of the ten hyperuricemic patients in group (A) (60%) had a cardiovascular disease and the only one hyperuricemic patient in group (B) had a cardiovascular disease, this was statistically not significant (P. value>0.05) . Table III.

There was an increase in the prevalence of hyperuricemia in diabetes mellitus patients with increasing age . Table IV , figure (C)

There was a correlation between the age and the involvement of the joints so that in the middle age groups ,lower limbs involvement is more than the upper limbs involvement and mostly one joint involvement while in the old age groups upper limbs involvement is more ,with more than one joint involvement . Table V.

Table I (prevalence of hyper uricemia in DM with joint problems versus DM without joint problems) .

group	Number of patient	Number of hyperuricemia	%
DM with joint problems	**30**	**10**	**33**
DM without joint problems	**50**	**1**	**2**
total	**80**	**11**	**13**

P. value <0.05 (statistically significant)
DM = diabetus mellitus.

Table II. (prevalence of cardiovascular disease in diabetes mellitus)

group	Number of patient	Number of cardiovascular diease	%
DM with joint problems	30	19	63
DM without joint problems	50	13	26
Total	80	32	40

Table III. (prevalence of hyperuricemia in cardiovascular disease)

group	Hyperuricemic patient	Hyperuricemia with cardiovascular disease	%
DM with joint problems	10	6	60
DM without joint problems	1	1	1
Total	11	7	63

P.value< 0.05

P. value > 0.05 (statistically not significant)

Table IV.(prevalence of hyperuricemia with age)

Age/years	Number of patient	Hyperuricemia with joint problems	%
< 24	0	0	0
25-34	3	0	0
35-44	3	0	0
45-54	3	1	33
55-64	13	3	23
65-74	5	3	60
75-84	3	3	1
Total	30	10	33

Table V.(correlation between age and involvement of joint)

Age/years	Upper limb joint involvement	Lower limb joint involment
40-59 (middle)	0	3
60-80(old)	**4**	**3**

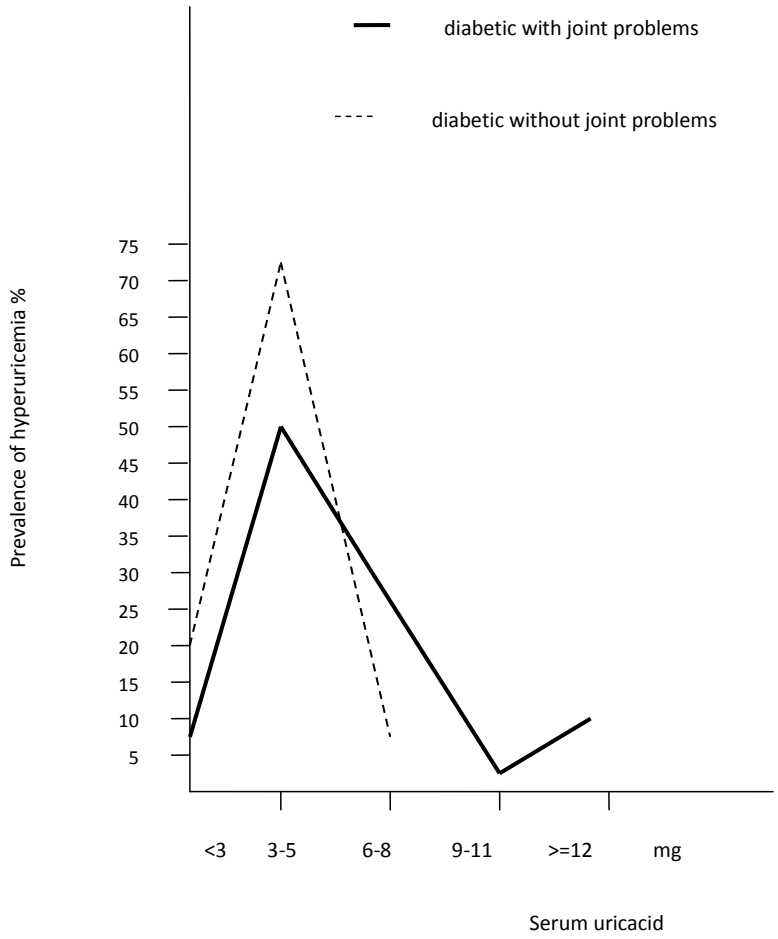

Figure A (relation ship between serum uric acid & prevalence of hypruricemia

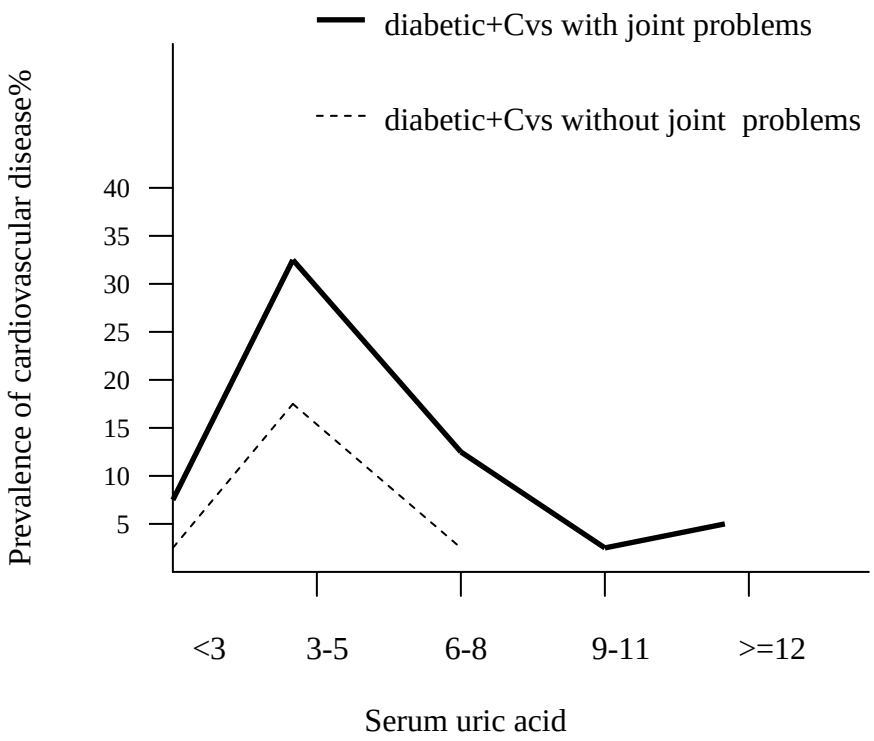

Figure B relation ship between serum uric acid & prevalence of cardio vascular disease.

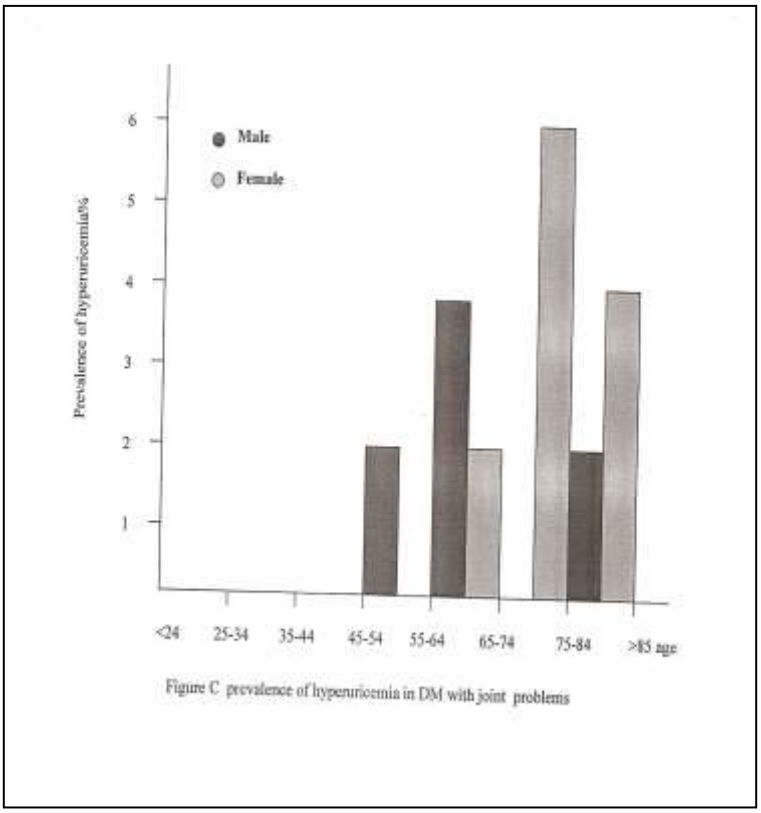

Figure C prevalence of hyperuricemia in DM with joint problems

Discussion and Conclusion:-

We have taken thirty diabetic patients with joint problems, (33%) of them were found to have hyperuricemia and these result were similar to study done by Andrew J . Luk 5'11 who studied hyperuricemia and diabetic in sixteen patients with (18%) had joint problems versus eight without joint problems .

He found that hyperuricemia induce impaired glucose tolerance by oxidative stress (glucose auto-oxidation and advanced glycosylation end product)4"8"9'12.

The prevalence of hyperuricemia with a cardiovascular disease was correlated with diabetic patients with joint problems these result were consistent with study done by Framingham heart study found no independent association between hyperuricemia and increased risk of cardiovascular diseases (in both studies, statistically not significant. 5"7"13)

The prevalence of hyperuricemia in diabetic patients with joint problems was increased with advancing age 1"2.

There was a correlation between age and limbs involvement in the middle age groups; lower limb joints involvement being more than the upper limb joints; while in old age groups ,upper limb joints involvement is more than that in the lower and this is correlated with study done by Niskaneu Lk , who explained that middle age adult association in groups with obesity ,high blood pressure, unhealthy cholesterol level and heavy alcohol use, while elderly is associated with kidney problems and the use of diuretic 5"10"14.

As seen from this study there is correlation between joint problems and high serum uric acid in diabetes mellitus.

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