**Research about:**

**Uric acid level among patients with diabetes** **mellitus**

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6th stage

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In the name of Allah,the first who deserves all

thanks and appreciation for our creator and that made all the change ,get to what is new and helping patients through his creatures themselves for pervade peace and cooperation among people .

To those who taught us letters of gold and words of jewel of the utmost and sweetest sentences in the whole knowledge .who reworded to us their knowledge simply and from their thoughts made a

Lighthouse guides us through the knowledge and

Success path,To our honoured teachers and

especially to our supervisor Dr. Dheaa Khalaf

ALOMERY….

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**INTRODUCTION**

Diabetes mellitus, disorder of carbohydrate metabolism characterized by impaired ability of the body to produce or respond to insulin and thereby maintain proper levels of sugar (glucose) in the blood.

type diabetes is a chronic illness characterized by the body. inability to produce insulin due to the autoimmune destruction of the

Beta cells in the pancreas. Although onset frequently occurs in childhood, the disease can also develop in adults.[1]

* Signs and symptoms

The classic symptoms of type 1 diabetes are as follows:

polyurea polydipsia polyphagia unexplained weight loss

Other symptoms may include fatigue, nausea, and blurred vision.

The onset of symptomatic disease may be sudden. It is not unusual for patients with type 1 diabetes to present with diabetic ketoacidosis (DKA).

* Type 2 diabetes mellitus consists of an array of dysfunctions characterized by hyperglycemia and resulting from the combination of resistance to insulin action, inadequate insulin secretion, and excessive or inappropriate glucagon secretion. See the image below.
* Signs and symptoms

Many patients with type 2 diabetes are asymptomatic. Clinical manifestations include the following:

Classic symptoms: Polyuria, polydipsia, polyphagia, and weight loss

Blurred vision

Lower-extremity paresthesias

Yeast infections (eg, balanitis in men)

* major complications of diabetes :\_ microvascular complications/// 1/eye high blood glucose and high blood pressure can damage eye blood vessels causing retinopathy cataract and glaucoma 2/high blood pressure damage small blood vessles and excess blood glucose overwork the kidneys resulting in nephropathy 3/neuropathy hyperglycemia damages nerves in peripheral nervous system this may result in pain and /or numbness ,,feet wounds may go undetected, get infected lead to gangrene

macrovascular complications/ 1/Brain increased risk of stroke and cerebrovascular disease including transient ischemic attack ,cognitive impairement 2/Heart high blood pressure and insulin resistance increased risk of coronary heart disease 3/Extremeties peripheral vascular disease results from narrowing of blood vessels increasing the risk for lacking blood flow in legs ,feet wounds are likely to heal slowly contributing to gangrene

**Hyperuricemia**

Hyperuricemia is an excess of uric acid in the blood. Uric acid passes through the liver, and enters your bloodstream. Most of it is excreted (removed from your body) in your urine, or passes through your intestines to regulate "normal" levels.

Hyperuricemia is generally divided into three pathophysiologic categories: uric acid underexcretion, uric acid overproduction, and combined causes.

**Metabolic syndrome**

Metabolic syndrome: This syndrome is characterized by hypertension, obesity, insulin resistance, dyslipidemia, and hyperuricemia,[22] and is associated with a decreased fractional excretion of urate by the kidneys.

RECENT FINDINGS: The prevalence of hyperuricemia in male adults with metabolic syndrome was increased and a large difference in prevalence of metabolic syndrome also existed in those with hyperuricemia compared with normouricemia. Even in those with

 normouricemia, higher serum uric acid levels were associated with metabolic syndrome. Serum uric acid was an independent risk factor for incident diabetes, and evidence showed that the patients with both gout and type 2 diabetes exhibited a mutual inter-dependent effect on higher incidences. Furthermore, obese patients often demonstrated insulin resistance and adipose tissue macrophage with low-grade inflammation, which is suggested to be the major contributor. Although alcohol intake is considered a risk for developing hyperuricemia, moderate alcohol intake showed a lower risk for developing type 2 diabetes and insulin resistance. Hyperinsulinemia reduces renal excretion of uric acid on the proximal tubular of the kidney leading to hyperuricemia, which has deleterious effects on endothelial function and on nitric oxide bioavailability, thus causing hyperinsulinemia.

**Methodology**

This is case control study was performed in twenty five diabetic and twenty five non diabetic patient at different age groups over aperiod of six months from 1st of October2018 to the 1st of April 2019 The total number of patients are 50 dividing into 25 diabetic and 25 nondiabetic collected from sixth ward of alhussein teaching hospital all patients case and control we measure serum uric acid for them by take blood sample from them ,put it in gel tube and enter it in centrefuge and put abbot for 15 min and then we get the result

Where the inclusion criteria are diabetic and non diabetic patients more than one year

And the exclusion criteria are diabetic patient less than one year ,gout,leukemia ,diuretic therapy,psoriasis ,preeclampsia randomly selected patient without obvious causes of uric acid abnormali

**RESULTS**

Table 1 presents numbers of male and females diabetic and non diabetic

that measured serum uric acid levels for them …

Table 2 presents classification&numbers of different age groups we take them to measure serum uric acid

 Table 3 presents mean, standered deviation and P value of serum uric acid of male and female diabetic and nondiabetic

Table 4 presents mean ,standered deviation and P value of serum uric acid according to age groups we take them

**Table1:-**

|  |  |  |
| --- | --- | --- |
| Control | Case | Gender |
| 12 | 10 | Male |
| 13 | 15 | Femal |

**Table 2:-**

|  |  |  |
| --- | --- | --- |
| Control | Case | Age |
| 11 | 2 | 18-44 |
| 6 | 11 | 45-64 |
| 8 | 12 | ≥ 65 |

**Table 3:-**

|  |  |  |  |
| --- | --- | --- | --- |
|   | Case | Control | P value |
| Gender | Mean | SD. | mean | SD. |
| Male | 7.77 | 2.88 | 5.67 | 2.75 | 1.7 |
| Female | 5.64 | 2.25 | 3.74 | 1.21 | 2.3 |

**Table 4:-**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Case | Control | P value |
| Age | Mean | SD. | mean | SD. |
| 18-44 | 2.99 | 0.35 | 3.45 | 1.22 | 1.03 |
| 45-64 | 6.19 | 2.37 | 4.31 | 2.08 | 1.69 |
| ≥65 | 6.15 | 1.96 | 6.29 | 2.71 | 0.13 |

**Discussion**

According to our results in table 3 ,the mean of serum uric acid of diabetic male is 7.77 which mean elevated in contrast to nondiabetic who their mean is 5.67 regarding normal while in female both diabetic and non diabetic have normal level but also diabetic patient have larger mean …

According to table 4 that study age groups we found that age group 45-64 have the highest value of mean of serum uric acid then age group >=65

and the lowest mean are 18-44 age group

So there is significant relathionship between serum uric acid and diabetes mellitus ..

Aplausible mechanism for the observed results of an inverse association between increasing serum uric acid and diabetes mellitus may be related to the inhibition of uric acid reabsorption in the proximal tubule by high glucose levels in diabetic individuals.

The main strengths of our study include its population-based nature and the availability of data on confounders for multivariable adjustment

We have alarge sample size that enabled us to

Perform separate analysis by gender .Furthermore,

All data were collected following rigorous methodology ,including a study protocol with standardized quality control checks.

In another study similar to our study ,they found that there is an inverse association was observed between elevated serum uric acid and diabetes mellitus even after adjusting for age,sex,race,education,smoking,alcohol

intake,BMI,hypertension and serum total cholesterol in both subgroups analysis by gender and hypertension .The large sample size available for the current analysis,our ability to adjust for all potential confounders and the consistency of these results after subgroup analysis by gender and hypertension suggests that our findings are less likely due t

o chance.Therefore,higher uric acid levels may not be a risk factor for diabetes mellitus as some researchers previously argued .

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