

# Dedication

**To my parents: the meaning of love.**

**To my husband: the source of my power.**

**To my daughters and my son: my great treasure.**

**To my brothers and sisters: the flowers of my life.**

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## Abstract

This study was performed in Khartoum state during the period from January to May 2011.

The aim of the study is to compare the sensitivity of C – reactive protein and GFR as a marker of Diabetic Nephropathy in Sudanese with type 2 diabetes mellitus.

Seventy five blood samples were collected from diabetic Sudanese patient with type 2 diabetes mellitus, and seventy five healthy volunteers control group for the comparison, GFR was calculated by using the equation of Cockcroft-Gault and CRP level was estimated turbidmetrically with automation technique (Mindray BS 300).

The study observed significant increase in the C-reactive protein level in the test group of type 2 diabetes mellitus when compared with control group ( $4.56 \pm 0.89$  mg/L verses  $1.57 \pm 0.76$  mg/L) respectively ( $P = 0.000$ ). Where as GFR was significantly decreased in the study group when compared with control group ( $94.04 \pm 12.3$  ml/min, verses  $115.12 \pm 13.7$  ml/min) respectively, ( $P = 0.000$ ). Significant maximum level of C-reactive protein in the test group with type 2 diabetes mellitus was recorded in the duration of the disease from 1 year to 5 years ( $5.2 \pm 1.0$  mg/L, versus  $1.7 \pm 0.65$  mg/ L) ( $p = 0.000$ ), In contrast, no significant decrease in mean GFR in the test group with type 2 diabetes mellitus compared with their control in the same duration of the disease from 1 year to 5 years ( $99.74 \pm 11.38$  ml/min, versus  $115 \pm 13.2$  ml/min) ( $p = 0.03$ ). The study recorded insignificant correlation between serum C-reactive protein levels with both the duration of type 2 diabetes mellitus and the patient's age ( $P = 0.647$ ) ( $P = 0.846$ )

**In conclusion:** CRP is higher in test group of type 2 diabetes mellitus than in healthy individuals, and reached the peak maximum in the first five years from the onset of type 2 diabetes mellitus, In contrast, GFR reached the minimum reduction after sixteen years from the onset of the type 2 diabetes mellitus.

## مُسْتَخْلِصُ الْدِرَاسَةِ

مرض السكري عبارة عن اعتلال أيضي يتميز بارتفاع مستوى السكر في الدم ،والذى يحدث نتيجة لاعتلالات جينية او خلل فى هرمون الانسولين. وهو من الاسباب الرئيسية لامراض الكلى.

مستوى معدل الرشح الكبيي تم قياسه بواسطة معادلة كوكروفت - قولت، أما مستوى بروتين سى المتفاعل فتم قياسه كيميائيا باستخدام الطريقه الذاتيه بواسطة جهازمندري اس 300.

لوحظ في هذه الدراسة زيادة في مستوى بروتين سى المتفاعل لدى المرضى (4.56mg/dL $\pm$ 0.89 mg/dL) مقارنة بالاصحاء (1.57mg/dL $\pm$ 0.76mg/dL) عند مستوى معنويه = .000.

لذلك لوحظ انخفاض معدل الرشح الكبييى عند المرضى ( $94.04 \text{ml/min} \pm 12.3 \text{ ml/min}$ ) اذا ما قورن بالاصحاء ( $115.12 \text{ ml/min} \pm 13.7 \text{ ml/min}$ ) عند مستوى معنويه = 0.000. بالرغم من ان هناك علاقه قويه بين انخفاض معدل الرشح الكبييى وفترة الاصابه بالنوع الثاني لمرض السكري (معامل الارتباط = 0.250 ) (مستوى المعنويه اقل من 0.05 )، الا انه لوحظ ان مستوى بروتين سى المتفاعل لم يتأثر بفترة الاصابه لكنه وصل لأعلى مستوياته خلال فتره مبكرة من الاصابه بالنوع الثاني لمرض السكري (من سنه الى خمس سنوات). بالالم قارنه فان مستوى معدل الرشح الكبييى قد انخفض بعد مرور ستة عشر سنه من حدوث الاصابه بالنوع الثاني من مرض السكري.



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## Abbreviations

ADH	Antidiuretic Hormone
AER	Albumin Excretion Rate
BMI	Body Mass Index
BUN	Blood Urea Nitrogen

CKD	Chronic Kidney Disease
CRP	C - reactive protein
DKA	Diabetic Ketoacidosis
DM	Diabetes mellitus
ELISA	Enzyme -Linked Immunosorbent Assay
ESR	Erythrocyte sedimentation rate
FPG	Fasting Plasma Glucose
GBM	Glomerular Basement Membrane
GDM	Gestational Diabetes mellitus
GFR	Glomerular Filtration Rate
HS-CRP	High Sensitivite C - reactive protein
IBD	Inflammatory Bowel Disease
IDDM	Insulin-dependent diabetes mellitus
IFG	Impaired Fasting Glucose
LADA	Latent Autoimmune Diabetes of Adults
MDRD	Modification of Diet in Renal Disease
NIDDM	Non-insulin-dependent diabetes mellitus
OGTT	Oral Glucose Tolerance Test
SBE	Sub acute Bacterial Endocarditis
SLE	Systemic Lupus Erthematosus
SPSS	Statistical Package for Social Science
STD	Standard