

# *Dedication*

To my mother.....

To my father.....

To my brothers.....

To my sisters.....

To my friends.....

And my colleagues...

I dedicate this work with my  
best wishes to all.

Mohammed

## Acknowledgements

All my thanks are in the name of Allah, the most Gracious and the most Merciful.

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## **Abstract**

Cross-sectional study performed in Khartoum state during period from April to July 2012.

The aim of the study is to compare between C-reactive protein and LDL cholesterol as markers for cardiovascular events in Sudanese types 2 diabetes mellitus.

Fifty blood samples were collected from Sudanese diabetic patients with type 2 diabetes mellitus, their age range from (35 – 80) years, and fifty healthy volunteers as control group for the comparison. Serum LDL was estimated enzymatically with spectrophotometer (Biosystem 310), and CRP was measure qualitative by slide methods. We assessed the value of these two measurements in predicting the risk of cardiovascular events in the study population.

The study observed significant increase in the LDL cholesterol level in the study group of type 2 diabetes mellitus when compared with control group ( $130.50 \pm 44.4$  mg/dl) verses ( $77.76 \pm 20.96$  mg/dl) respectively, (p.value = (0.00).and the level of LDL is greater in females than in males test group of type 2 diabetes mellitus ( $116.42 \pm 47.81$  mg/dl) verses ( $90.71 \pm 34.1$  mg/dl) respectively p.value(0.03). significant maximum elevation of LDL was observed during the early period of type 2 diabetes mellitus in group 2 ( more than 10 years) ( $141.03 \pm 48.26$  mg/dl) in contrast, the CRP reached the maximum level in group 1 (1-5 years from the onset of type 2 diabetes mellitus).

These data suggest that the C-reactive protein is higher in test group of type 2 diabetes mellitus than in healthy individuals, reached the peak maximum in first five years from onset of type 2 diabetes mellitus, where LDL cholesterol level reached the peak maximum after more than 10 years from onset of type 2 diabetes mellitus.

## مستخلص الدراسة

تم تنفيذ هذه الدراسة المقطعية في ولاية الخرطوم خلال الفترة من أبريل- يوليو 2012م.

والهدف من هذه الدراسة هو مقارنة بين البروتين المتفاعل سيو الكوليسترول الاقل كثافة كعلامات لاصابة بامراض القلب والأوعية الدموية للمرضى السودانين المصابين بداء السكري النوع الثاني.

تم جمع عينات الدم من خمسين مريضاً بالسودان المصابين بداء السكري من النوع الثاني ، وكانت ذات اعمار ما بين (30-80) عاماً، وخمسين متطوعاً من الأصحاء متشابهين في الاعداد كمجموعة مراقبة للمقارنة .وقمنا بقياس LDL بالطريقة الإنزيمية بواسطة جهاز (Biosystem 310)، وايضا قياس CRP بطريقة نوعي بواسطة التجمع في الشريحة الزجاجية. قمنا بتقييم قيمة هذه القياسات اثنين في توقع خطر الحوادث القلبية الوعائية في مجتمع الدراسة.

لاحظت الدراسة زيادة كبيرة في مستوى الكوليسترول الاقل كثافة في مجموعة الدراسة من داء السكري من النوع الثاني عند مقارنة مع مجموعة التحكم ( $44.4 \pm 130.50$  ملغ / دل) و ( $77,76 \pm 20,96$  ملغ / دل) على التوالي، ( $p.value = 0.00$ ). ومستوى LDL أكبر في الإناث أكثر من الذكور في مجموعة اختبار لمرض السكري من النوع الثاني ( $116.42 \pm 47.81$  ملغ / دل) و ( $90,71 \pm 34.1$  ملغ / دل) على التوالي ( $p.value = 0.03$ ). الارتفاع الأقصى كبير من بلغ CRP وحظ LDL خلال الفترة المبكرة من داء السكري من النوع الثاني في المجموعة 2 (أكثر من 10 سنوات) ( $48.26 \pm 141.03$  ملغ / دل) في المقابل، فإن الحد الأقصى في المجموعة 1 (1-5) سنوات من بداية داء السكري من النوع الثاني

هذه المعطيات تشير إلى أن بروتين سي التفاعلي هو أعلى اختبار مجموعة من داء السكري من النوع الثاني من لفى الأشخاص الاصحاء، وصلت أقصد روته في السنوات الخمس الأولى من بداية ظهور مرض السكري من النوع الثاني، حيث مستوى الكوليسترول LDL بلغ أقصد روته بعد أكثر من 10 عاماً من ظهور داء السكري من النوع الثاني.

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## Abbreviations

<b>NIH</b>	<i>National Institutes of Health</i>
<b>IDDM</b>	<i>insulin-dependent diabetes mellitus</i>
<b>LADA</b>	<i>latent autoimmune diabetes of adulthood</i>
<b>NIDDM</b>	<i>non-insulin-dependent diabetes mellitus</i>
<b>UKPDS</b>	<i>United Kingdom Prospective Diabetes Study</i>
<b>IDF</b>	<i>International Diabetes Federation</i>
<b>AACE</b>	<i>American Association of Clinical Endocrinology</i>
<b>HbA1c</b>	<i>Glycosylated hemoglobin</i>
<b>MODY</b>	<i>Maturity-onset diabetes of the young</i>
<b>APS</b>	<i>Autoimmune polyglandular syndrome</i>
<b>CDC</b>	<i>Centers for Disease Control and Prevention</i>
<b>OGTT</b>	<i>Oral glucose Tolerance test</i>
<b>GH</b>	<i>Growth hormone</i>
<b>PVD</b>	<i>peripheral vascular disease</i>
<b>IHD</b>	<i>Ischemic Heart Disease</i>
<b>CHF</b>	<i>Congestive Heart Failure</i>
<b>RHD</b>	<i>Rheumatic Heart Disease</i>
<b>DALYS</b>	<i>Disability-Adjusted Life Years</i>
<b>AMI</b>	<i>Acute Myocardial Infarction</i>
<b>AIDS</b>	<i>Acquired immune Deficiency Syndrome</i>
<b>ARF</b>	<i>Acute Rheumatic Fever</i>
<b>VLDL</b>	<i>Very Low Density Lipoproteins</i>
<b>IDL</b>	<i>Intermediate Density Lipoproteins</i>
<b>LDL</b>	<i>Low Density Lipoproteins</i>
<b>HDL</b>	<i>High Density Lipoproteins</i>
<b>Lp</b>	<i>Lipoprotein</i>
<b>PLG</b>	<i>Plasminogen</i>
<b>PAD</b>	<i>Peripheral Artery Disease</i>
<b>ELISA</b>	<i>Enzyme Link Immune Sorban Assay</i>
<b>UKPDS</b>	<i>United Kingdom Prospective Diabetes Study</i>
<b>IFN</b>	<i>Interferon</i>
<b>IL</b>	<i>Interleukin</i>
<b>MCP</b>	<i>Monocyte chemoattractant protein</i>
<b>MMP</b>	<i>Matrix metalloproteinases</i>
<b>MPO</b>	<i>Myeloperoxidase</i>
<b>TNF</b>	<i>Tumor necrosis factor</i>

