

بسم الله الرحمن الرحيم



**Sudan University of Science and Technology
College of Graduate Studies**

**C-reactive Protein, Serum Magnesium and Lipid Profile Among Obese
and Overweight Subjects in Khartoum State.**

بروتين سي التفاعلي ومصل المغنسيوم وملف الدهون لدى الاشخاص المصابين بالسمنة وزيادة الوزن في ولاية
الخرطوم

*A dissertation submitted in partial fulfillment for the requirements of
M.Sc. degree in Medical Laboratory Sciences – Clinical Chemistry*

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الآية

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قال تعالى :

اقْرَأْ بِاسْمِ رَبِّكَ الَّذِي خَلَقَ (١) خَلَقَ الْإِنْسَانَ مِنْ عَلَقٍ (٢) اقْرَأْ وَرَبُّكَ الْأَكْرَمُ
(٣) الَّذِي عَلَّمَ بِالْقَلَمِ (٤) عَلَّمَ الْإِنْسَانَ مَا لَمْ يَعْلَمْ (٥)

صدق الله العظيم

سورة العلق الآيات 1-5

Dedication

*I dedicate this research to for whom that joy my life
and light of my eyes
mother and late father*

*Also I dedicated to my brothers, sisters and
friends*

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I would like to thankfully Allah for give me courage and power as well as guidance in conducting this research ,despite all difficulties

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Abbreviation

Abbreviation	Full term
AAP	Amino antipyrine
ATP	Adenine triphosphate
BMI	Body mass index
CHD	Coronary heart disease
CRP	C-reactive protein
DBP	Diastolic blood pressure
HC	Hips circumference
HDL-C	High density lipoprotein lipase cholesterol
Kg	Kilogram
LDL-C	Low density lipoprotein lipase cholesterol
LPL	Lipoprotein lipase
M ²	Meter squares
Mg/dL	Milligram per deciliter
Mg/L	Milligram per liter
PRR	Patten recognition receptor
SBP	Systolic blood pressure
TC	Total cholesterol
TG	Triglyceride
VLDL	Very low density lipoprotein
WAT	White adipose tissue
WC	Waist circumference
WHR	Waist hips ratio
WHO	World heath organization
μL	Micro liter

Abstract

Background : Obesity considered a “disease state” due to the changes it causes on the body as increasing the risk for a large number of additional diseases. type two diabetes, dyslipidemia, stroke and it associated with Inflammatory processes that have important roles in the etiology of cardiovascular diseases and this study aimed to evaluate C-reactive protein, lipid profile and serum magnesium in obese and overweight subjects

Materials and Methods: Ninety Sudanese individual were enrolled in this study, classified into 30 obese,30 overweight and 30 normal weight as control match group. Serum CRP was measured by using immunoturbidymetric method, lipid profile and serum magnesium were estimated by chemical detection method using colorimeter.

Results: The study showed that obesity was more common in female(62.2%) than male (37.7%) with ratio 1.00:2.00 and mean of age (28.0±5.00)years ,also the results showed that CRP and lipid profile (TC ,TG ,LDL-C) were significantly increased among obese and overweight versus control mean ± SD values of CRP (mg/L)to be (68.0± 50.0),(14.4±12.0) versus(4.40±3.00) with p value =0.000 serum total Cholesterol (mg/dL) to be (207±49.0), (163 ±16.0) versus (144 ±13.0) with p value =0.000, serum triglyceride (mg/dL) to be(122 ± 35.0), (97.0 ±23.0) versus (74.0 ±19.0) with p value =0.000, serum HDL-C (mg/dL) to be (39.0±3.10), (44.0± 5.00) and (51.0± 10.0) with p value =0.000, S-LDL-C (mg/dl) to be (104± 37.2), (75.9 ± 24.0) versus (61.0 ± 16.4) with p value =0.000, stating that the differences were statistically significant.

result also showed significantly decreased in HDL-C and magnesium in both obese and overweight versus control group , HDL-C (mg/dL) to be (39.0±3.10), (44.0± 5.20) and (51.0± 10.0) with p value =0.000 serum magnesium (mg/dL) to be (1.40±0.14), (1.60±0.20) versus (1.90±0.21) with p value =0.000 respectively.

Conclusion: The study concludes that obesity is more common in female than male and serum CRP, Total serum cholesterol S-triglyceride , S-LDL-C are higher in both obese and overweight and serum magnesium ,S-HDL-C are low in both obese and overweight subject.

المستخلص

خلفية الدراسة: تعتبر السمنة "حالة مرضية" هي نفسها بسبب التغيرات التي تسببها على الجسم، مما يزيد من خطر الإصابة بعدد كبير من الأمراض الإضافية. نوع داء السكري، دسليبيديا، والسكتة الدماغية، ويرتبط أيضا مع العمليات الالتهابية التي لها أدوار هامة في المسببات من أمراض القلب والأوعية الدموية هذه الدراسة تهدف الي تقييم مستوي بروتين سي التفاعلي ومصل المغنسيوم والدهون الدهنية لدي الاشخاص المصابين بالسمنة وزيادة الوزن

المواد والطرق: تم تسجيل تسعين فردا سودانيا في هذه الدراسة، مصنفة إلى 30 يعانون من السمنة المفرطة، 30 يعانون من زيادة الوزن و 30 طبيعي الوزن كمجموعة السيطرة بروتين سي في المصل وملف الدهون الدهنية والمغنسيوم في المصل تم قياسهم بطرق التعكر المناعية الكشف الكيمائي باستخدام مقياس

النتائج: أظهرت الدراسة أن السمنة أكثر شيوعا لدى الإناث (62.2%) من الذكور 37.7% بنسبة ومتوسط العمر (5.00±28.0)، كما أظهرت النتائج أن بروتين سي التفاعلي وملف الدهون(الكوليسترول الكلي و الدهون الثلاثية،والكوليسترول منخفض الكثافة) قد ازدادو معنويا بشكل ملحوظ في السودانيين على حد سواءفي اللذين يعانون من السمنة المفرطة وزيادة الوزن مقابل مجموعة السيطرة(المتوسط±الانحراف المعياري) بروتين سي التفاعلي مليجرام/ديسيلتر (50.0± 68.0) , (12.0±14.0) مقابل (3.10±4.40) ودلالة معنوية =0.000) إجمالي الكوليسترول في الدم مليجرام/ديسيلتر(49.0±207) (16.0 ±163)مليجرام/ديسيلتر مقابل 13.0±144 مليجرام/ديسيلتر ودلالة معنوية = 0.000) , ثلاثي الجلسيوليد مليجرام/ديسيلتر (34.0±121) (23.0±97.0) مقابل (19.0±74.0) مليجرام/ديسيلتر ودلالة معنوية =0.000)،الكوليسترول منخفض الكثافة مليجرام/ديسيلتر (37.0±104) , (24.0±75.0) مليجرام /ديسيلتر مقابل 14±60 مليجرام/ديسيلتر ودلالة معنوية =0.000 تتابعيا كما اظهرت الدراسة انخفاض معنوي في الكوليسترول مرتفع الكثافة والمغنسيوم (2.10±39.5) (5.20±44.1) مقابل (10.0±51.0) (مليجرام/ديسيلتر ودلالة معنوية =0.001) , المغنسيوم مليجرام/ديسيلتر (0.10 ±1.50) (0.10 ± 1.60) (0.10) مقابل (0.20 ±1.90) ودلالة معنوية =0.000) تتابعيا.

الخلاصة: خلصت الدراسة ان السمنة اكثر شيوعا في الاناث مقارنة بالذكور وان بروتين سي التفاعلي ، الكوليسترول الكلي في الدم، ثلاثي الجلسيريد والكوليسترول منخفض الكثافة اعلي في السمنة وزيادة الوزن وان الكوليسترول عالي الكثافة والمغنسيوم منخفضين في السمنة وزيادة الوزن