

الاية

قال تعالى

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

﴿۱﴾ وَوَضَعْنَا عَنْكَ وِزْرَكَ ﴿۲﴾ الَّذِي أَنْقَضَ ظَهْرَكَ ﴿۳﴾ وَرَفَعْنَا لَكَ
ذِكْرَكَ ﴿۴﴾ فَإِنَّ مَعَ الْعُسْرِ يُسْرًا ﴿۵﴾ إِنَّ مَعَ الْعُسْرِ يُسْرًا ﴿۶﴾ فَإِذَا فَرَغْتَ فَانصَبْ ﴿۷﴾ وَإِلَى
رَبِّكَ فَارْغَب ﴿۸﴾

صدق الله العظيم

سورة الشرح

Dedication

I dedicate my research to my dear father who always support and encourage me and never let me give up

To my mother for her prayers

To my husband for his patience, love and consolation

To my daughter

To my sister Maab who help me the most

To Walla who always be kind and friendly

To whom I lean on and when I feel down and blue they calm me down and lift up my hopes to the sky,

To my friends and colleagues for their helping, to my relevants whom I love and respect.

,

Acknowledgment

All Thanks To Allah For His Blessing

*To My Supervisor Dr.Amar Who Guided Me To Succeed And Always
Show Kindness And Generosity*

, To My Friends Arwa And Momena

My Great Thanks To The Staff of (Rick) For Their Co-Operatio

To All My Teachers Whom Take My Hand And Advise Me At Each Step

Abstract

This is a descriptive cross-sectional study conducted at the Radiation & Isotopes Centre Khartoum (RICK) in Khartoum State to evaluate plasma copper levels in Breast Cancer women. A total of 60 women with breast cancer were enrolled in this study, 30 healthy volunteers' women as control group, in 32% age between age 40 and less (n= 19), 48% in age between 41 to 60 (n= 29) and 20% in age 61 and more (n= 12). Atomic absorption spectrophotometric assay was used for copper estimation, BMI were calculated using international formula, data were analyzed by Statistical (SPSS version 15) computer software.

The results showed significant increase in the mean of plasma copper levels in patients when compared with control group (1.3 ± 0.3) versus (0.9 ± 0.14) with (*P-value* 0.000). Also there was a significant decrease in the plasma copper levels in premenopausal women with breast cancer when compared with the mean of menopausal (1.4 ± 0.3) versus (1.2 ± 0.3) (*P-value* 0.009). the study showed insignificant increase in the mean of plasma copper levels in normal and overweight patient (*P-value* 0.167). insignificant increase in the mean of plasma copper according to the durations of breast cancer less than or equal two year and more than two years (1.0 ± 0.00) versus (1.3 ± 0.3) (*P-value* 0.312).

The result of current study indicated that there was significant decrease in the mean of plasma copper levels in women with breast cancer according to their number of children who have less than 3 children (1.4 ± 0.31) when compared with mean of patients who have more than 3 children (1.1 ± 0.31) (*P-value* 0.003).

In conclusion the copper level increases in breast cancer. The differences in results may be explained by differences in dietary intake and age.

الخلاصة

هذه دراسة عرضية وصفية أجريت في مركز النظائر المشعة والإشعاع الخرطوم (RICK)، في ولاية الخرطوم. إن هدف الدراسة الحالية أن تقيم مستويات النحاس في بلازما النساء السودانيات المصابات بسرطان الثدي. سجلت 60 امرأة مصابة بسرطان الثدي في هذه الدراسة، بالإضافة إلى 30 امرأة صحية متطوعة كمجموعة ضابطة. في هذه الدراسة 32% من مجموعة الإختبار في عمر بين 40 وأقل (n = 19). 48% في العمر بين 41 إلى 60 (n = 29) و20% في عمر 61 وأكثر (n = 12). استعملت طريقة امتصاص الطيف الذري لتقدير النحاس، BMI حسب استعمال صيغة دولية، ثم حُلَّت البيانات إحصائياً ببرنامج (SPSS15). نتائج الدراسة أوضحت زيادة هامة في متوسط النحاس في المرضى عند مقارنتها بالمجموعة الضابطة (0.3 ± 1.3) مقابل (0.14 ± 0.9) على التوالي مع (P-value 0.000). أيضاً كان هناك نقصان هام في مستويات النحاس في النساء قبل سن اليأس المصابات بسرطان الثدي عند مقارنتها بمتوسط سن اليأس (0.3 ± 1.4) مقابل (0.3 ± 1.2) قيمة (P-value 0.009). في الدراسة الحالية كان هناك زيادة ليست ذو دلالة إحصائية في متوسط النحاس في المرضى ذوي الوزن الطبيعي والزائد قيمة (P-value 0.167). علاوة على ذلك كان هناك زيادة ليست ذو دلالة إحصائية في متوسط النحاس طبقاً لمدة سرطان الثدي أقل من أو نظير سنتان وأكثر من سنتان (0.00 ± 1.0) مقابل (0.3 ± 1.3) قيمة (P-value 0.312). نتيجة الدراسة الحالية أشارت إلى نقصان هام في متوسط النحاس في النساء المصابات بسرطان الثدي طبقاً لعدد الأطفال أقل من ثلاثة أطفال (0.31 ± 1.4) عند مقارنتها بمتوسط المرضى الذين لديهم أكثر من ثلاثة أطفال (0.31 ± 1.1) قيمة (P-value 0.003). هذه الدراسة تستنتج أن هناك زيادة في مستويات النحاس في سرطان الثدي. الاختلافات في النتائج قد توضح بالاختلافات في الكمية الغذائية والعمر ويجب أن يؤكد باستعمال حجم عينة أكبر.

List of contents

الإية	II
Dedication	III
Acknowledgment	IV
Abstract	V
الخلاصة	VI
List of Contents	VII
List of Tables	X
List of Figures	XI

Chapter One

1. Introduction And Literature Review

1.1	The Cupper (Cu^{++})	2
1.1.1	Biochemistry And Homeostasis of Cupper	2
1.1.2	Biochemical Functions of Cupper	4
1.1.2.1	Energy Production	4
1.1.2.2	Connective Tissue Formation	4
1.1.2.3	Iron Metabolism	4
1.1.2.4	Central Nervous System	4
1.1.2.5	Melanin Synthesis	4
1.1.2.6	Antioxidant Function	4
1.1.2.7	Regulation of Gene Expression And Intracellular Cupper	5
1.1.2.8	Hemoglobin Synthesis	5
1.1.3	Dietary Source of Cupper	6
1.1.4	The Recommended Dietary Allowance	6
1.1.5	Pathology of Cupper	7

1.1.6	Copper Deficiency	7
1.1.6.1	Malnourished Infant	7
1.1.6.2	Premature Infant	7
1.1.6.3	Nutritional Support	7
1.1.6.4	Menkes Syndrome	8
1.1.6.5	Malabsorption Syndrome	8
1.1.6.6	Cardiovascular Disease	8
1.1.6.7	Signs And Symptoms of Copper Deficiency	8
1.1.7	Toxicity	8
1.1.7.1	Wilson Disease	8
1.1.7.2	Cancer	9
1.1.7.3	Symptoms of Copper Toxicity	10
1.2	Breast Cancer	10
1.2.1	Epidemiology	10
1.2.2	Pathophysiology	11
1.2.3	Clinical Staging of Breast Cancer	11
1.2.4	Diagnostic Tests	11
1.2.5	Copper and cancer	12
1.3	Literature Review	12
1.3.1	Rationale	13
1.3.2	Objectives	13
1.3.2.1	General Objective	13
1.3.2.2	Specific Objectives	

Chapter Two

2. Materials and Method

2.1	Materials	15
2.1.1	Study Design	15
2.1.2	Study Group	15
2.1.3	Sample Collection	15
2.1.4	Ethical Consideration	15
2.2	Method	15
2.2.1	Estimation of Plasma Copper	15
2.2.3	Principle of flame atomic absorption spectroscopy	15
2.2.4	Procedure	16
2.2.5	Reference Intervals	16
2.2.6	Atomic Absorption Spectroscopy	17
2.2.7	Statistical Test	17

Chapter Three

3	Results	
---	---------	--

Chapter Four

4. Discussion, Conclusion and Recommendation

4.1	Discussion	26
4.2	Conclusion	28
4.3	Recommendation	29

References	30
-------------------	-----------

List of Tables

TABLE	Title	PAGE
1.1	Showed Key Copper-Containing Enzymes And Their Functions	5
1.2	The Recommended Dietary Allowance of Copper In All Stage of Life	6
1.3	Showed Standard Atomic Absorption Conditions For Cu	16
1.4	Showed Standard Flame Emission Conditions For Cu	16

List of Figures

Figures	Title	PAGE
1.1	Copper Metabolism.	3
2.1	Atomic Absorption Spectroscopy Device	17
3.1	Showed Percentage of Breast Cancer Among Age Groups(Years)	19
3.2	Showed Mean Concentration of Copper In Patients (Mg\L), With Mean Concentration of Copper In Controls	20
3.3	Showed Mean of Patients With Age < 45 Years ,With Mean of Patients With Age > 45 Years	21
3.4	Showed Mean of Patients Who Have Less Than 3 Children , With Mean of Patients Who Have More Than 3 Children	22
3.5	Showed Mean of Patients With Bmi < 25 , With Mean of Patients With Bmi > 25	23
3.6	Showed Mean of Patients With Duration of Disease For < 2 Years, With Mean of Patients With Duration of Disease For > 2 Years,	24