

بسم الله الرحمن الرحيم

## الآية

قال تعالى:

فَتَبَسَّ ضَاحِكًا مِنْ قَوْلِهَا وَقَالَ رَبِّ أَوْزِرْ عَنِّي أَنْ أَشْكُرَ نِعْمَتَكَ الَّتِي أَنْعَمْتَ عَلَيَّ  
وَعَلَىٰ وَالِدَيَّ وَأَنْ أَعْمَلَ صَالِحًا تَرْضَاهُ وَأَدْخِلْنِي بِرَحْمَتِكَ فِي عِبَادِكَ الصَّالِحِينَ

صدق الله العظيم

سورة النمل الآية (19)

# Dedications

To the soul of my father...

Who taught me how to feel the pain of others

To my mother...

Who gave me care and love

To my family...

For their abundant support and for their love

To our teachers ...

Very special friends and colleagues who were integral part of our support group

Special dedication...

To all patients from whom sample were collected

I dedicate this work

Marwan

.

~ II ~

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## **Abstract**

This is case control , hospital based study was carried out to measure the levels of zinc and copper in Sudanese asthmatic patients attending alshaab teaching hospital, Khartoum state, during the period from may to june 2015

Fifty Sudanese asthmatic patients, including 30 males (aged 20-90years), and 20 females (aged 18-80years), were enrolled in this study, also fifty apparently healthy individual to serve as control group (aged 18-90), including 30 males and 20 females.

Five ml of venous blood were collected from each participant, the plasma obtained; zinc and copper levels were measured by Atomic absorption spectrophotometer (AAS).

Statistical analysis of obtained results revealed that; mean of plasma levels of zinc was significantly lower among asthmatic patients compared to control group (p value 0.002), while the mean of copper levels was significantly higher (p value 0.003). In asthmatic patients plasma levels of zinc and copper not influenced by age (p value copper 0.436, zinc 0.114) and sex (p value copper 0.584, zinc 0.377) and body mass index (p value copper 0.638, zinc 0.868) and duration of disease (p value copper 0.356, zinc 0.652) . In conclusion depletion of plasma zinc may contribute to the disturbed trace elements concentration in asthmatic patients, and will be consider in the treatment and follow up of asthmatic patients to well fitness and better life.

## مستخلص الدراسة

أجريت هذه الدراسة لقياس مستويات الخارصين والنحاس في بلازما الدم لدى السودانيين المصابين بمرض الربو (الأزمة) الذين يترددون على مستشفى الشعب التعليمي بولاية الخرطوم بالسودان في الفترة من مايو حتى يونيو 2015م.

إشتملت الدراسة على 50 من المرضى المصابين بمرض الربو (الأزمة)، 30 منهم ذكور تتراوح أعمارهم ما بين 20 إلى 90 سنة و 20 منهم إناث تتراوح أعمارهم ما بين 18 إلى 80 سنة. أيضاً، إشتملت الدراسة على 50 من مجموعة الأصحاء منهم 30 من الذكور و 20 من الإناث تتراوح أعمارهم ما بين 18 إلى 90 سنة.

أخذت 5 مل من الدم الوريدي وتم إستخلاص بلازما الدم وتحليلها لقياس عنصري الخارصين والنحاس بإستخدام جهاز الإمتصاص الذري. وبعد التحليل الإحصائي لهذه النتائج وجد أن هنالك إنخفاض ذو دلالة معنوية في متوسط مستويات الخارصين بالمقارنة مع مجموعة الأصحاء بمستوى معنوية (0.002) بينما وجد أن هنالك إرتفاع ذو دلالة معنوية في متوسط مستويات النحاس بمستوى معنوية (0.003). من هذه الدراسة وجد أن مستويات الخارصين والنحاس لا تتأثر بإختلاف العمر (مستوى المعنوية للنحاس 0.436, وللخارصين 0.114 ) والجنس (مستوى المعنوية للنحاس 0.584 , وللخارصين 0.377) والوزن (مستوى المعنوية للنحاس 0.638 , وللخارصين 0.868 ) وطول المرض ( مستوى المعنوية للنحاس 0.356 , وللخارصين 0.652 ) . ومن نتائج هذه الدراسة تم التوصل الى أنه لا بد من الأخذ بالإعتبار قياس عنصري الخارصين والزنك لعلاج ومتابعة مرضى الربو (الأزمة) لتحسين صحتهم وتوفير حياة أفضل لهم.

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## **Abbreviations**

**AAS:** Atomic absorption spectrophotometer

**ASM:** Airway smooth muscle

**CD:** Cluster of differentiation

**CO:** Carbonic monoxide

**COPD:** Chronic obstructive pulmonary disease

**CTLA:** Cytotoxic T-lymphocyte associated protein

**DNA:** Deoxyribonucleic acid

**FEV:** Forced expiratory volume

**IL:** Interleukin

**LABA:** Long-acting beta agonists

**MDIs:** Metered- dose inhalers

**PVC:** Polyvinyl chloride

**RDA:** Recommended daily allowance

**RNA:** Ribonucleic acid

**SOD:** Sodium oxide dismutase

**U.S:** United States

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