بسم الله الرحمن الرحيم

شبكة المعلومـــــات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

﴿ قـــســـم ﴾

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد اعدت دون آية تغيرات

يجب أن

تحفظ هذه الأفلام بعيداً عن الغبار

في درجة حرارة من 15 – 20 مئوية ورطوبة نسبية من 20-40 %

To be kept away from dust in dry cool place of
15 – 25c and relative humidity 20-40 %

بعض الوثائق الأصلية تالفة

بالرسالة صفحات

لم ترد بالأصـــل

EFFECT OF BLOOD-LEAD LEVEL ON THE KIDNEY FUNCTIONS OF RENAL TRANSPLANTED PATIENTS

BY
Rasha Hamdy Aly Al Najjar
B.Sc. Community Health (Nutrition),
King Saud University, 1993

A Thesis Submitted in Partial Fulfillment
Of
The Requirement for the Master Degree
In
Environmental Science

Department of Medical Science
Institute of Environmental Studies and Research
Ain Shams University

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APPROVAL SHEET

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This Thesis for Master Degree in Environmental Science has been approved by:

1. **Prof. Dr. Sabry A. Gohar**
   Prof.and Head of Internal (1) &Nephrology – Faculty of Medicine – Ain Shams University
2. **Prof. Dr. Abdel Aziz M. Kamal**
   Prof. and Head of Public Health – Faculty of Medicine – Ain Shams University
3. **Prof. Dr. Mostafa H. Ragab**
   Prof. in Medical Dept. Institute of Environmental Studies & Research – Ain Shams University

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Under the supervision of:

1.Prof. Dr. Moustafa H. Ragab
Prof. in Medical Science Dept. – Institute of Environmental Studies & Research – Ain Shams University

2.Dr. Eman A. Elazab
Lecturer in Internal & Nephrology Dept. – Faculty of Medicine – Ain Shams University

3.Dr. Azza A. Atef
Lecturer in Biochemistry Dept. – Faculty of Science – Ain Shams University

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Abstract

There is increasing evidence that health may be harmed by chronic exposure to lead present in the environment at levels insufficient to produce classical symptoms of lead poisoning. Chronic low level exposure to lead has been linked to a high incidence of renal dysfunction.

The aim of this study is to investigate the effect of environmental lead exposure on kidney functions, blood pressure (Bp), hemopioetic parameters in both renal transplanted recipients (RTxP) and normal volunteers. : Fiftyeight subjects were included in this study, 28 recipients and 30 healthy normal volunteers. A case report form was filled up for every participant. Blood lead level (BLL), serum (s.) creatinine, s. urea, s. uric acid, creatinine clearance (CrCl), hemoglobin % (Hb%), hematocrite (HCT), white (WBCs) and red (RBCs) blood cells were measured.

Statistical analysis of the results indicated the following: RTxP had higher systolic and diastolic Bp, s.uric acid, s.creatinine and s.urea levels and they had lower CrCI than the controls. Among normal control, there was a significant positive correlation between BLL and diastolic Bp. However, among recipient there was a significant positive correlation between BLL and both systolic and diastolic BP, and a positive significant correlation between BLL and WBCs and s.uric acid. On dividing recipients and controls according to BLL into high BLL group (BLL $\geq$ 40 µg / dl) and low BLL group (BLL $<$ 40 µg/dl). Recipients with low BLL had significantly higher systolic and diastolic Bp, s. creatinine, s. urea and s. uric acid but they had lower CrCI than their respective controls . However, this significant difference was not observed between normal controls and recipients with BLL $\geq$ 40 µg /dl and there was no significant difference observed regarding systolic blood pressure . In addition WBCs count in recipients with high BLL was significantly higher compared to that of normal control .

Conclusions : (1) All studied subjects had BLL above the WHO recommended value of 15 µg /dl . (2) Renal transplanted recipients seem to be more vulnerable to the toxic effects of lead exposure . (3) s. uric acid and diastolic Bp are recommended as tests to detect early health deviation due to lead exposure.

Content

List of Abbreviations

µg	Microgram
6PGD	6-phosphogluconate Dehydrogenase
A	Arterial
ALAD	Delta-aminolevulinic Acid Dehydrase
ALAS	Delta-aminolevulinic Acid Synthetase
BLL	Blood Lead Level
Bp	Blood Pressure
CAPD	Continuos Ambulatory Peritoneal
CrCl	Creatinine Clearance
CRF	Chronic Renal Failure
CsA	Cyclosporin A
DBp	Diastolic Blood Pressure
dl	Diciliter
ESRD	End Stage Renal Disease
F	Female
FEP	Free Erythrocyte Protoporphyrin
g	Gram
G6PD	Glucose 6-Phosphate Dehydrogenase
GA3PD	Glyceraldehyde 3-phosphate Dehydrogenase
GFR	Glomerular Filtration Rate
GST	Glutathione S-transferase
HcT	Hematocrite
Hgb	Hemoglobin
Kg	Kilogram
KU/L	King Armestrong unit / L
L	Liter
LDH	Lactate Dehydrogenase
M	Male
mcg	Microgram
mg	Milligram
min	Minuet
ml	Milliliters
MMF	Mycophenolate Mofetil
mmHg	Millimeter Mercury

mumol	Milli Mol
MWL	Moderate Weight Loss
n	Number
NAG	Urinary N- Acetyl-glucosaminidase
NS	Non Significant
Pb	Lead
PbB	Blood Lead
PbBp	Lead Binding Proteins
PCV	Packed Cell Volume
POD	Pyruvate oxaloacetate deaminase
ppm	Part Per Million
RBCs	Red Blood Cells
RTxP	Renal Transplanted patients
SBp	Systolic Blood Pressure
SD	Standard Deviation
SPSS	Statistical package for the social science
SWL	Substantial Weight Loss
TCA	Toxic chemical analysis
U	International Unit of Enzyme Activity
µg	Micrograms
USA	United States of America
SPSS	Venous
V	Venous
WBCs	White Blood Cells
WHO	World Health Organization
WM	Weight Maintenance
XRF	X-Ray film

List of Tables

Introduction

Lead is the heaviest of all base metals, it is a blue-gray metal with poisonous salts; it is very soft malleable and is easily cast, moulded and extruded; symbol, pb; atomic number, 82; atomic weight, 207.19

For all practical purposes, there are two forms of lead. The first is inorganic lead, in which the various salts and oxides are considered to act identically once absorbed into the systemic circulation. The second form is alkyl lead, notably tetraethyl lead and tetramethyl lead. These are clearly different from inorganic forms of lead, as to both absorption and disposition in the body. **(John Doll et al. 1980).**

The health status of an individual, a community or a nation is determined by, and related to the environment in which people live. The environment comprises two components, the internal environment of man and the external environment surrounding him. In the modern concept, disease is due to a disturbance in the balance between man and his environment **(Robert W.Schrier and Carl W. Gottschalk 1988).**

Lead and other metals are important group of environmental chemicals that have caused diseases in humans from ancient times to the present. **(Carl A. Burtis and Edward R. Ashwood 1986)**

Toxic effects of lead are seen from pica, industrial exposure, contaminated water, alcohol, mining or inhalation of smoke, or leaded gasoline. Chronic exposure to lead has also been linked to a high incidence of renal dysfunction, which is