



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكرو فيلم

بسم الله الرحمن الرحيم



MONA MAGHRABY



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شبكة المعلومات الجامعية التوثيق الإلكتروني والميكرو فيلم



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جامعة عين شمس

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يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار



MONA MAGHRABY



**STUDY OF THE EFFECT OF INTRADIALYTIC EXERCISE
ON THE BONE PROFILE IN PREVALENT
HEMODIALYSIS PATIENTS**

Thesis

***Submitted for partial fulfillment of Master Degree in
Internal Medicine***

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**تأثير التمرينات اثناء جلسه الغسيل على علامات
العظام لدى مرضى الفشل الكلوي الذين على غسيل
الكلى بانتظام**

رسالة

**توطئة للحصول علي درجة الماجستير في الباطنة العامة
مقدمة من**

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قالوا

لَسْبَحَانَكَ لَا عِلْمَ لَنَا
إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ
الْعَلِيمُ الْعَظِيمُ

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CONTENTS

Title	Page
• List of Abbreviations	I
• List of Table	III
• List of Figures.....	5
• Introduction	1
• Aim of the work	7
• Review of literature.....	
Chapter (1): Mineral bone disorder	8
Chapter (2): Exercise.....	31
• Patients and methods	47
• Results	55
• Summary	79
• CONCLUSIONS	81
• Recommendation	82
• References	83
• الملخص العربي	-

LIST OF ABBREVIATIONS

CKD	: Chronic Kidney Disease
MBD	: Mineral Bone Disease
PTH	: Parathormone
ALP	: Alkaline Phosphatase
BALP	: Bone Alkaline Phosphatase
IDE	: Intradialytic Exercise
KIDEGO	: Kidney Disease Improving Global Outcomes
ESRD	: End Stage Renal Disease
CRP	: C reactive protein
CV	: Cardiovascular
ROD	: Renal Osteodystrophy
BMD	: Bone Mineral Density
RPE	: Rate of Perceived Exertion
GFR	: Glomerular Filtration Rate
DM	: Diabetes Mellitus
ISHD	: Ischemic Heart Disease
COPD	: Chronic Obstructive Pulmonary Disease
DBP	: Vitamin D binding protein
HD	: Hemodialysis
SHPT	: Secondary hyperparathyroidism
PO₄	: Phosphorus
EBCT	: electron beam computed tomography
FDA	: Food and Drug Administration
RAAS	: Renin angiotensin aldosterone system
Po₄	: Phosphorus
CUA	: Calci-uremic arteriopathy
PA	: Physical activity
6 MWT	: six minutes walk test

List of Abbreviations

METs	: Metabolic equivalent tasks
SPBT	: Short Performance Battery Tests
BMI	: Body Mass Index
HR	: Heart Rate
ELISA	: Enzyme-Linked Immunosorbent Assay
CBC	: Complete Blood Picture
Ca	: Calcium
EP	: Exercise Program
HGB	: Hemoglobin

LIST OF TABLE

Table No	Subjects	Page
Table (1):	Aerobic endurance exercise training on a cycle ergometer.....	44
Table (2):	Comparison between exercise group and control group according to demographic data.	55
Table (3):	Comparison between exercise group and control group according to medical diseases and smoking.....	58
Table (4):	Comparison between exercise group and control group according to 6min walk test by meters.....	59
Table (5):	Comparison between exercise group and control group according to short battery tests scores at baseline.	59
Table (6):	Comparison between short battery tests scores before and after exercise program (exercise group).	60
Table (7):	Comparison between short battery tests scores at baseline and after 3months in control group.....	61
Table (8):	Comparison Between both groups regarding Change in Physical Performance after 3 months.	62
Table (9):	Comparison between exercise group and control group according to baseline laboratory data.	63
Table (10):	Comparison between baseline and after 3 months according to laboratory data in exercise group.....	64

List of Table

Table No	Subjects	Page
Table (11):	Comparison between baseline and after 3 months according to laboratory data in control group.....	66
Table (12):	Correlation between after 3months ALP, PTH, BALP with SPBT scores and other parameters, using Spearman's rank correlation coefficient (rs), in the exercise group.	67
Table (13):	Correlation between ALP, PTH and BALP, using Spearman's rank correlation coefficient (rs), in the exercise group.	67

LIST OF FIGURES

Figure No	Subjects	Page
Figure (1):	PTH parathyroid hormone	26
Figure (2):	Bone in dialysis patients.	28
Figure (3):	How to set up an individually dosed and adapted exercise training program.....	37
Figure (4):	Intradialytic cycling exercise training program quoted from	40
Figure (5):	The Borg scale – rate of perceived exertion (RPE)	43
Figure (6):	Bar chart between exercise group and control group according to age (years).	56
Figure (7):	Bar chart between exercise group and control group according to gender.	56
Figure (8):	Bar chart between exercise group and control group according to BMI.....	57
Figure (9):	Bar chart between exercise group and control group according to smoking and medical diseases.	58
Figure (10):	Bar chart between short battery tests scores before and after EP in exercise group.....	60
Figure (11):	Bar chart between baseline and after 3 months according to short battery tests scores in control group.....	61
Figure (12):	Bar chart showing changes in physical performance in exercise group compared to control group after 3 months.	62
Figure (13):	Bar chart between baseline and after 3 months according to ALP and PTH in exercise group.....	65

✍ List of Figures

Figure No	Subjects	Page
Figure (14):	Bar chart between baseline and after 3 months according to Albumin and BALP in exercise group.....	65
Figure (15):	Bar Chart Showing no Difference in Baseline and After 3 months serum alkaline phosphatase, Bone specific alkaline phosphatase and parathyroid hormone in Controls.	66

Abstract

Background: Chronic kidney disease increases the risk of fractures and altered bone and mineral metabolism. Exercise training could be a non-pharmacological therapeutic intervention. The aim of this work is to evaluate the effect of intradialytic exercise training on bone markers in hemodialysis (HD) patients.

Results: Forty adult patients on regular HD participated in the study. Twenty of which completed 3 months supervised intradialytic cycling exercise program and 20 served as controls. At baseline, there was no difference between both groups regarding age, sex, physical performance, and laboratory studies performed. After 3 months, the exercise group showed significant improvement in short performance battery test (SPBT) total score ($P<0.001$) associated with significant decrease in serum parathormone (PTH) ($P=0.01$) and increase in serum alkaline phosphatase (ALP) and bone specific alkaline phosphatase (BALP) ($P<0.05$ and $P<0.001$ respectively). Controls did not show similar change in SPBT or laboratory studies. There was no significant change in serum calcium or phosphorus in both groups. A significant positive correlation was observed between SPBT scores post-exercise and both BALP and ALP levels ($r=0.432$, $P=0.01$ and $r=0.645$, $P<0.01$ respectively). Also, an inverse relation was observed between SPBT and PTH ($r=-0.503$, $P=0.01$).

Conclusion: Intradialytic cycling exercise program resulted in significant increase in physical performance associated with decrease in serum PTH and increase in BALP and ALP in HD patients. This indicates the positive influence of exercise not only on physical performance in dialysis patients but also on bone metabolism.

Keywords: Intradialytic exercise, Bone-specific alkaline phosphatase, Bone biomarkers, PTH