بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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شبكة المعلومات الجامعية

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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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MONA MAGHRABY

Efficacy of Vitamin D Supplementation on Bone Mineral Density and Vitamin D Binding Protein in Children with Autism

Thesis

Submitted for Fulfillment of Ph.D in Childhood Studies

(Care of Children with special needs)
Medical Studies Department for Children

By

Gina Huessin Ahmed Ahmed Elpatrik
M.Sc Ain Shams University
Assistant Researcher of Dempartment at Research on Children with Special Needs

Under Supervision of

Dr. Maisa Nasr Farid
Professor of Pediatrics
Head of medical Studies Department for children
Faculty of Postgraduate Childhood Studies
Ain Shams University

Dr. Howida Hosny Al-Gebaly
Professor of Pediatrics
Dean of Faculty of Postgraduate Childhood Studies
Ain Shams University

Dr. Nagwa Abdel-Meguid Mohamed
Professor of Human Genetics
Research on Children with Special Needs
NRC

Faculty of Postgraduate Childhood Studies
Ain Shams University
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صفحة الموافقة

اسـم الطالب : جينا حسين احمد احمد البطريق

عنوان الرسالـة : تأثير فيتامين (د) على كثافة العظام و البروتين الرابط لفيتامين (د) في الأطفال الذين يعانون من اضطرابات التوحد

اسـم الدرجـة : دكتوراة الفلسفة في دراسات الطفولة قسم الدراسات الطبية للأطفال (رعاية الاطفال ذوي الاحتياجات الخاصة)

لجنة الحكم:

١- **أ.د/نجوى عبد المجيد محمد** (رئيساً و مشرفاً)
أستاذ الوراثة ألبشرية – المركز القومى للبحوث
كلية الدراسات العليا للطفولة – جامعة عين شمس

٢- **أ.د/ هوايد حسنى الجبالى** (مناقشاً و مشرفاً)
أستاذ طب الأطفال وعميد كلية الدراسات العليا للطفولة
جامعة عين شمس

٣- **أ.د/ مايسة نصر فريد** (مناقشاً و مشرفاً)
أستاذ طب الأطفال و رئيس قسم الدراسات الطبية للأطفال
كلية الدراسات العليا للطفولة – جامعة عين شمس

٤- **إيهاب محمد عيد** (مناقشاً من الدخل)
أستاذ الصحة العامة قسم الدراسات الطبية للأطفال
كلية الدراسات العليا للطفولة – جامعة عين شمس

٥- **محمد خالد المنباوى** (مناقشاً من الخارج)
أستاذ صحة الطفل – المركز القومى للبحوث

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صفحة العنوان

عنوان الرسالة : تأثير فيتامين (د) على كثافة العظام و البروتين الرابط لفيتامين (د) في الأطفال الذين يعانون من اضطرابات التوحد "

اسم الطالبة : جينا حسين أحمد أحمد البطريق

الدرجة العلمية : دكتوراة الفلسفة في دراسات الطفولة

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Gina Huessin Elpatrik

DEDICATION

TO:

My Dear Parents especially my mum
Who give me too much
And receive too little

My Dear Husband... **Hatem Elmaraghy**
&
My lovely Sons **(Omar &Adam)**

My Patients.....

Abstract

Background: Autism spectrum disorder is a neuro-developmental disorder, which is reported to affect 1 in 59 children. Social communication deficits and restricted or repetitive interests and behaviors are main characterizing features. It is caused by the interaction of both genetic and environmental factors.

Objective: To assess vitamin D, Vitamin D Binding Protein (VDBP) and bone mineral density in autistic children, compared to typically developing children, In addition to question the benefit of using oral vitamin D daily supplementation for 4 months on autistic children's outcome.

Patients and Methods: The study was conducted on 30 autistic patients recruited from the Autism Disorders Clinic, Medical Research Centre of Excellence, National Research Centre with age ranging from 3-7 years. Patients were randomly supplemented by vitamin D in a dose of 600 IU/day for 4 months. Thirty healthy children were included as controls, with matched age and socioeconomic status to the study group. Vit D assessment was done using blood samples, VBBP was assessed using ELISA. Moreover, DEXA was done over femur neck and lumber regions.

Results: The results of the study revealed that autistic group have vitamin D deficient. However, there was no significance between patients before and after supplementation. On comparing VDBP levels of the patients and controls groups,,we discovered statistically highly significant difference of its level between before and after supplementation in autistic patients. In addition, we revealed that low bone mineral density DEXA of (neck femur and lumber) were discovered. There was no significant difference between autistic children (before and after) supplementation

Conclusion: Wrapping up, it is still premature to conclude that autism and vitamin D are both related to eachother. Although this work did not uncover any of the mysteries of autism, yet it highlighted the tight spot of vitamin D deficiency in children in general, and in autistic children in particular who are more prone to vitamin D deficiency complications as regard bone metabolism and the higher risk for immobilization. Further studies should be implemented on a larger group of autistic children, and longer duration of vitamin D supplementation to reach optimal blood vitamin D levels. We recommend vitamin D supplementation using nanotechnology to overcome associated problems with its administration.

Keywords: Vitamin D, autism spectrum disorder, vitamin D binding protein, Dual Energy X-Ray Absorptiometry

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List of Abbreviations

Abb.	Full term
1, 25 OHD	1 and 25 Hydroxy- vitamin D.
25 OH vitamin D	25 hydroxy -vitamin D.
25 (OH) D	25 hydroxy vitamin D
5-HT	Serotonin
ABA	Applied behavior analysis
AD	Alzheimer's disease
ADDM	Autism Developmental Disabilities Monitoring
ADHD	Attention deficit hyperactive disorder
ADI-R	Autism Diagnostic Interview-Revised
AFM	α-albumin/afamin
AFP	α-fetoprotein
ALB	Albumin
APA	American psychiatric association
ASD	Autism spectrum disorder
BMC	Bone mineral content
BMD	Bone mineral density
CARS	Childhood Autism Rating Scale
CDC	Centers for Disease Control and Prevention
CDD	Childhood Disintegrative Disorder
CNS	Central nervous system
COMT	Catechol-O-methyl-transferase
Cu	Copper
DEXA	Dual Energy X-Ray Absorptiometry
DMPS	2-3-dimercaptopropane-1-sulfonate
DMSA	2-3-dimercaptosuccinic acid)

List of Abbreviations Cont...

Abb.	Full term
DSM-5	Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition.
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition.
DTT	Discrete trial teaching
EEG	Electroencephalogram
ELISA	Enzyme linked immunosorbent assay
FDA	Food and Drug Administration
Floortime/DIR	Developmental, Individual Differences based, and Relationship based approach
GABA	Gamma-amino-butyric acid
GDNF	Glial neurotrophic factor
HIV/AIDS	Humen immunodeficiency virus / acquired immunodeficiency syndrome
ICD-10	International Classification of Diseases, Tenth.
IL	Interleukin
ISCD	the International Society of Clinical Densitometry
MARRS	Membrane associated rapid response steroid binding
MHC1	Major Histocompatibility complex class I
MMR II	Measles, mumps, and rubella vaccine
NGF	Nerve growth factor
NIMH	National Institute of Mental Health Research Domain Criteria
NT3	Neurotrophine-3
NT-4	Neurotrophin-4
OT	Occupational Therapy

List of Abbreviations Cont...

Abb.	Full term
PDD	Pervasive developmental disorders.
PDD-NOS	Pervasive developmental disorder-not otherwise specified
PECS	Picture Exchange Communication System
PKU	Phenylketonuria
PTH	Parathyroid hormone
RDoC	Research Domain Criteria
RIA	Radioimmunoassay
ROI	Regions of interest
RS	Rett syndrome
RXR	Receptors of the retinoic X receptor
SES	Socio-economic standard
TEACCH	Training and Education of Autistic and Related Communication Handicapped Children
TPH2	The serotonin-synthesizing gene tryptophan hydroxylase 2.
TS	Tourette syndrome
VDBP	Vitamin D binding protein
VDR	Receptors for Vit D
VDRE	Vitamin D responsive elements
Zn	Zinc

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