ADHD Symptoms: Relation to Levels of Omega-3 Fatty Acids

Thesis

Submitted for partial fulfillment of MD. Degree in Psychiatry

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2012

Acknowledgement

Words can never express my deepest gratitude and indebtedness to ***Professor Safeya Effat,*** Professor of Neuropsychiatry, Faculty of Medicine, Ain Shams University. I owe her very much for her meticulous supervision, continuous guidance and gentle encouragement. I am truly thankful to her; she gave much time and attention to this work to be accomplished that way.

I would like to express my thanks and admiration to ***Professor Nagwa Abdel Meguid,*** Professor of Human Genetics, National Research Center for her tremendous support, precious advice, provision of precious literatures and for her extreme knowledge and interest that made this work possible.

I am extremely grateful to ***Dr. Hanan Hussein,*** Assistant Professor of Neuropsychiatry, Faculty of Medicine, Ain-Shams University for her constructive guidance, her meticulous revision and sharing the vision of this work that helped formulating it in its final form.

I am profoundly grateful to ***Dr. Hanan Azzam,*** Assistant Professor of Neuropsychiatry, Faculty of Medicine, Ain Shams University her constant support and guidance that helped me in overcoming many obstacles during this work to make it finally see the day light.

I would like to express my thanks to ***Dr. Amr Sobhi,*** Assistant Professor of Biochemistry, National Research Center for his intensive support and faithful cooperation which were indispensable to complete this work.

I would like to express my thanks to *Mr. Abdel Gawad Khalifa,* Clinical Psychologist, Institute of Psychiatry, Ain Shams University for his valuable help in conducting the psychometric assessments of this thesis.

Without my professors and colleagues, this work would not have come to reality, I am really thankful to all of them especially to *Dr. Mona Anwar,* Assistant Professor of Biochemistry, National Research Center, *Dr. Mostafa Bastway,* Lecturer of Neuropsychiatry, Misr for Science and Technology University, *Dr. Nesreen Mohsen,* Lecturer of Neuropsychiatry, Ain-Shams University and *Dr. Rehab*

Osama, Lecturer of Biochemistry, National Research Center.

Finally, I cannot forget the kind help, valuable cooperation and limitless support of my dear beloved family; I really owe them a lot.

List of Contents

List of Contents i

List of Figures ii

List of Tables iv

List of Abbreviations vi

Introduction **1**

Chapter 1:
Attention Deficit Hyperactivity Disorder **5**

Chapter 2:
Omega-3 and the Brain **30**

Chapter 3:
Omega-3 and Attention Deficit Hyperactivity Disorder **59**

Chapter 4:
Complementary Treatment of Attention Deficit Hyperactivity Disorder **78**

Subjects and Methods **103**

Results **123**

Discussion **141**

Limitations **173**

Conclusions **174**

Recommendations **175**

Summary **177**

References **182**

List of Figures

Figure 1: Inverted U influence of catecholamines on prefrontal cortex function**…..…..... 15**

Figure 2: Tuning cortical pyramidal neurons in ADHD **……..……..……..… 16**

Figure 3: Difference between saturated & unsaturated fatty acids**…...……..…. 31**

Figure 4: *Cis* & *trans* configuration **……..… 32**

Figure 5: Chemical structure of docosahexaenoic acid (DHA)**……... 34**

Figure 6: Biosynthesis of the principle polyunsaturated fatty acids**……...……..... 37**

Figure 7: Triple Cell Membrane Synergy**…….... 39**

Figure 8: Effect of a shift from deficient diet to control diet on dopamine levels in the prefrontal cortex & the nucleus accumbens**……..... 67**

Figure 9: Representative photomicrographs of tyrosine hydroxylase-positive dopamine neurons from rats fed control or omega-3 deficient diets **……...…..…. 69**

Figure 10: Desaturase, elongation & oxidation steps in the metabolic pathway of omega-3**……. 76**

Figure 11: Linear curve showing the negative correlation between DHA level & Conners' ADHD index subscale**…… 132**

Figure 12: Linear curve showing the negative correlation between DHA level & DSM-IV: Inattentive subscale**…..…….. 133**

Figure 13: Linear curve showing the negative correlation between DHA level & DSM-IV: Total subscale **……...……..... 134**

Figure 14: Linear curve showing the negative correlation between DHA level & total omission in Vigil continuous performance test**……..... 136**

Figure 15: Linear curve showing the negative correlation between DHA level before treatment & total error in Vigil continuous performance test**……...…. 137**

List of Tables

Table 1: DSM-IV-TR diagnostic criteria for ADHD… **18**

Table 2: Omega-3 fatty acids…… **35**

Table 3: Omega-6 fatty acids……..... **36**

Table 4: Summary of studies on essential fatty acid status in children with ADHD……..…… **60**

Table 5: Sociodemographics of both patient and control groups……..……..…. **124**

Table 6: Scores of Conner's Scale in children with ADHD before treatment……..….. **126**

Table 7: Scores of Vigil continuous performance test in children with ADHD before treatment……. **127**

Table 8: Comparison of levels of omega-3 fatty acids between children with ADHD & healthy controls……... **128**

Table 9: Correlation between Level of EPA and scores of Conner's Parent Rating Scale……... **129**

Table 10: Correlation between level of EPA and scores of Vigil continuous performance test**……. 130**

Table 11: Correlation between level of DHA and scores of Conner's Parent Rating Scale**…..…….. 131**

Table 12: Correlation between level of DHA and scores of Vigil continuous performance test**……..… 135**

Table 13: Levels of EPA and DHA before and after treatment**……..... 138**

Table 14: Scores of Conner's Parent Rating Scale before and after treatment**……..…… 139**

Table 15: Scores of Vigil continuous performance test before and after treatment**…….. 140**

List of Abbreviations

- **AA:** Arachidonic Acid
- **ADHD:** Attention Deficit Hyperactivity Disorder
- **ADHD SC-4:** Attention Deficit Hyperactivity Disorder Symptom Checklist-4
- **ALA:** Alpha-Linolenic Acid
- **ASD:** Autism Spectrum Disorders
- **B-FABP:** Brain-Fatty Acid Binding Proteins
- **CA1:** Cornu Ammonis 1
- **CA3:** Cornu Ammonis 3
- **Ca-ATPase:** Calcium Adenosine Triphosphatase
- **CID:** Collision Induced Dissociation
- **CNS:** Central Nervous System
- **CPRS-R-L:** Conners' Parent Rating Scale-Revised; long version
- **DA:** Dopamine
- **DGLA:** Dihomo-Gamma-Linolenic Acid
- **DHA:** Docosahexaenoic Acid

- **DNA:** Deoxyribonucleic Acid
- **DPA:** Docosapentaenoic Acid
- **DRD4:** Dopamine Receptor D4
- **DRD5:** Dopamine Receptor D5
- **DSM-III:** Diagnostic and Statistical Manual of Mental Disorders, Third Edition
- **DSM-IV:** Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition
- **DSM-IV-TR:** Diagnostic and Statistical Manual of Mental Disorders (the text revision of the fourth edition)
- **EFA:** Essential Fatty Acids
- **EPA:** Eicosapentaenoic Acid
- **ETA:** Eicosatetraenoic Acid
- **ETE:** Eicosatrienoic Acid
- **FABP:** Fatty Acid Binding Proteins
- **FADS:** physical Fatty Acid Deficiency Signs
- **FDA:** Food and Drug Administration
- **GLA:** Gamma-Linolenic Acid
- **H-FABP:** Heart-Fatty Acid Binding Proteins

- **HPA:** Heneicosapentaenoic Acid
- **HPLC/Ms/Ms:** High performance liquid chromatography / Mass spectroscopy / Mass spectroscopy
- **HTA:** Hexadecatrienoic Acid
- **HTR1B:** 5-hydroxytryptamine receptor 1B
- **ICD-10:** The International Statistical Classification of Diseases and Related Health Problems, 10th Revision
- **IQ:** Intelligence Quotient
- **LA:** Linoleic Acid
- **M.I.N.I. Kid:** Mini International Neuropsychiatric Interview for Children
- **mRNA:** messenger Ribonucleic Acid
- **n-3:** omega-3
- **n-6:** omega-6
- **Na+K+-ATPase:** Sodium-Potassium Adenosine Triphosphatase
- **NE:** Norepinephrine
- **NICE:** The National Institute for Health and Clinical Excellence
- **NMDA:** N-Methyl-D-Aspartic acid

- **ODD:** Oppositional Defiant Disorder
- **p:** The short arm of the chromosome
- **PLA2:** Phospholipase A2
- **PPAR:** Peroxisome Proliferated Activated Receptors
- **PPARG:** Peroxisome Proliferated Activated Receptor Gamma
- **PUFAs:** Polyunsaturated Fatty Acids
- **PXR:** Retinoid X Receptor
- **q:** The long arm of the chromosome
- **RAR:** Retinoic Acid Receptor
- **RBC:** Red Blood Cell
- **SDA:** Stearidonic Acid
- **SDQ:** Strengths and Difficulties Questionnaire
- **SLC6A3:** Solute carrier family 6 member 3
- **SNAP-25:** Synaptosomal-Associated Protein 25
- **SNAP-IV:** Swanson, Nolan and Pelham rating scale-Forth Edition
- **SNc:** Substantia Nigra pars compacta
- **SPSS:** The Statistical Package for Social Sciences

- **SREBPs:** Sterol Regulatory Element Binding Proteins
- **TOVA:** Test of Variables of Attention
- **VMAT2:** Vesicular Monoamine Transporter
- **VTA:** Ventral Tegmental Area
- **WHO:** World Health Organization
- **WISC:** Wechsler Intelligence Scale for Children

Introduction

Attention deficit hyperactivity disorder (ADHD) is characterized by pervasive and impairing symptoms of inattention, hyperactivity and impulsivity according to DSM-IV ***(American Psychiatric Association, 1994)***. The World Health Organization (WHO) uses a different name—hyperkinetic disorder (HD)—but lists similar operational criteria for the disorder ***(World Health Organization, 1993)***. Regardless of the name used, ADHD/HD is one of the most thoroughly researched disorders in medicine.

Epidemiological studies indicate that ADHD is a prevalent disorder affecting 5.3% of children worldwide ***(National collaborating centre for mental health, 2009)***. In USA current prevalence estimates for childhood ADHD range from 5% to 8%, while in Europe it is significantly lower than this range ***(Timimi and Taylor, 2004)***. This range is higher in Arabian countries reaching 9.4% in Egypt ***(El Missiry et al., 2007)***, 9.4% in Qatar ***(Bener et al., 2006)*** and up to 44% in Saudi Arabia among primary school children ***(Al Hamed et al., 2008)***.