



Role of Magnetic Resonance Spectroscopy and Diffusion Tensor Imaging in Autism children

ESSAY

Submitted by

Maryam Mohamed Ali Mohamed

M.B.B.CH

In partial fulfillment of master degree of Radiodiagnosis

Supervised by

Dr. Sahar Farouk Shaaban

Professor of Radiodiagnosis

Ain Shams University

Dr. Tougan Taha Abd ElAziz

Lecturer of Radiodiagnosis

Ain Shams University

Faculty of Medicine

Ain Shams University

2014

Acknowledgment

First and foremost ,all appreciation and praise to Allah, the Most Gracious, the Most Merciful.

I would like to express my deep gratitude to Prof. Sahar Farouk Shaaban, professor of Radiodiagnosis, Ain Shams University. She has given me guidance and advice in every way during the course of this work.

My sincere thanks to Dr TouganTahaAbdElAziz , Lecturer of Radiodiagnosis, Ain Shams University. for her continuous guidance and support.

I would like to express my deepest thanks to my dear son "Ayham", I am heartily thankful for his endless love and support.

Special thanks to my parents and all my family for their endless everlasting support and for their sustained encouragement.

Last but not least ,great appreciation to my country Libya, and to my second home Egypt that included me to achieve this goal.

Maryam Mohamed Ali Mohamed

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List of abbreviation

ANOVA	analysis of variance
ASD	Autism Spectrum Disorder
Cho	Choline
CHESS	Chemical shift selective saturation
Cr	Creatine
CSI	chemical shift imaging
DD	Developmental delay
DTI	Diffusion tensor imaging
EPI	echo planar imaging
FA	Fractional anisotropy
FACT	Fiber assignment by continuous Tracking
Gln	Glutamine
Glx	Glutamate
¹ H-MRS	Hydrogen Proton Magnetic Resonance Spectroscopy
ID	Intellectual disability
IQ	Intelligence quotient

MD	Mean Diffusivity
mI	Myo-inositol
mM	Millimolar
MMR	Measles Mumps and Rubella
MRI	Magnetic Resonance Imaging
MRSI	Magnetic resonance spectroscopic imaging
NAA	N-acetyl Aspartate
ppm	Part Per Million
PRESS	Point Reserved Spectroscopy
PROPELLER	Periodically rotated overlapping parallel lines with enhanced reconstruction
P.value	Probability value
RD	Radial Diffusivity
SD	Standard deviation
STEAM	Stimulated Echo Acquisition Mode
TD	Typically developing
TBSS	Tract-based spatial statistics
WM	White matter

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Introduction

Autism is a neurodevelopmental disorder defined by impairments in communication and social interaction, along with repetitive behaviors and restricted interests (**Walker et al , 2012**).

Neuropathology of the autism is likely due to multiple genetic and environmental factors that alter groups of neurons in different regions of the brain. Both genes and environment can alter the structure of the developing brain in different ways (**Gadad et al,2013**).

Magnetic resonance imaging (MRI) studies have found regional volumetric differences when comparing autism subjects to healthy controls. In that, autistic 2-3 years old had more cerebral and cerebellar white matter, and more cerebral cortical gray matter than normal ,whereas older autistic children and adolescent did not have such enlarged gray and white matter volumes (**Courchesne et al,2001**).

Several imaging studies have highlighted white matter, as particularly altered in autism (**Schumann et al ,2010**).

Interestingly, although broad volumetric differences are prominent and consistent in early Autism spectrum disorder, such differences have not been found in adolescents or adults with autism (**Courchesne et al ,2004**).