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Role of New MRI Modalities (MR Spectroscopy, Perfusion and Diffusion Tensor Imaging) in multiple Sclerosis

Essay

*Submitted in Partial Fulfillment for Master Degree
In Radiodiagnosis*

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2015

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قالوا

لَسْبَحَانَكَ لَا عِلْمَ لَنَا
إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ
الْعَلِيمُ الْعَظِيمُ

صدق الله العظيم

سورة البقرة الآية: ٣٢



To

The soul of my Father

To

My Mother

To

My Brother and Friends



*First and foremost, I feel indebted to **God**, the most merciful, who gave me the power to accomplish this work.*

*I wish to express my gratitude to my supervisor, **Prof. Dr. Yasser Ali Mohamed Abdelmawla**, Professor of Radiodiagnosis, Faculty of Medicine, Ain Shams University. His unique supervision, meticulous advice and the long time and tremendous effort he offered were invaluable in accomplishing this work.*

*I also express my deepest thanks to **Dr. Amir Louis Louka**, Lecturer of Radiodiagnosis, Faculty of Medicine, Ain Shams University for his patience, friendly attitude and for being generous with time and effort.*

Finally, Many thanks and appreciation to all those who generously supported me by all means, the staff of Radiodiagnosis Department, Ain Shams University.



Ahmed Salah Elmasarawey

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List of Abbreviations

Abb.	Full term
ADC	Apparent diffusion coefficient
AIF	Arterial input function
ASL	Arterial spin labeling
BAT	The time of arrival
BBB	Blood brain barrier
CAT	Computed Axial Tomography
CBF	Cerebral blood flow
CBV	Cerebral blood volume
CCSVI	Chronic cerebrospinal venous insufficiency
CHESS	Chemical shift selective saturation
Cho	Choline
CIS	Clinically isolated syndromes
C-MRI	Conventional magnetic resonance
CNS	Central nervous system
Cr	Creatine
CSF	Cerebrospinal fluid
CSI	Chemical Shift Imaging
CST	Cortico-spinal tract
DIS	Dissemination of lesions in space
DIT	Dissemination of lesions in time
DSC	Dynamic Susceptibility Contrast

Abb.	Full term
DTI	Diffusion tensor imaging
DWI	Diffusion-weighted imaging
EDSS	Expanded Disability Status Scale
EPI	Echo-planar imaging
FA	Fractional anisotropy
FOV	Field-of-view
GA	Glatiramer acetate
Gd	Gadolinium
Gln	Glutamine
GM	Gray matter
H MRS	Proton Magnetic resonance spectroscopy
HA	Hunter's angle
HARDI	High angular resolution diffusion imaging
Lac	Lactate
MAG	Myelin-associated glycoprotein
MD	Mean diffusivity
mI	Myoinositol
MRI	Magnetic resonance imaging
MRS	Magnetic resonance spectroscopy
MRSI	Magnetic resonance spectroscopic imaging
MTI	Magnetization transfer imaging
MTT	Mean transit time

Abb.	Full term
NAA	N-acetylaspartate
NAAG	N-acetyl aspartyl glutamate
NAGM	Normal-appearing gray matter
NAWM	Normal-appearing white matter
NEX	Number of excitations
NP	Neuropsychological
ppm	Parts per million
PPMS	Primary progressive multiple sclerosis
PRESS	point reserved spectroscopy
PRMS	Progressive relapsing multiple sclerosis
rCBV	Relative cerebral blood volume
RGB	Red, green, and blue
ROI	Region of interest
RRMS	Relapsing remitting multiple sclerosis
SNR	Signal-to-noise ratio
SPMS	Secondary progressive multiple sclerosis
STEAM	Stimulated echo acquisition mode
TA	Time of arrival
TE	Echo time
TR	Repetition time
TTP	Time to peak
VOI	Volume of interest

Abb.	Full term
WBNA	whole-brain NAA concentration
WM	White matter

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