

Objective Assessment of Cortical Activity Changes in Stroke Patients before and after Hand Rehabilitation with and without Botulinum Toxin Injection

Thesis

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

سَتْرِيهِمْ آيَاتِنَا فِي الْآفَاقِ وَفِي أَنْفُسِهِمْ
حَتَّى ۞ يَتَّبِعِينَ لَهُمْ إِنَّهُ الْحَقُّ أَوْلَمَ يَكْفُرْ
□ بِرَبِّكَ إِنَّهُ عَلَى ۞ كُلِّ شَيْءٍ شَهِيدٌ

صدق الله العظيم

سورة فصلت آية (٥٣)

To

My father, gone now but never forgotten
Thank you for all you did, my greatest teacher
and my best friend.



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List of Abbreviations

<i>Abbr.</i>	<i>Full-term</i>
AANEM	American Association of Neuromuscular and Electrodiagnostic Medicine
AMPA	α -amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid
ARAT	Action Research Arm Test
ATP	Adenosine triphosphate
AUC	Area under curve
BG	Basal ganglia
BOLD	Blood oxygen level dependent
BTX	Botulinum toxin
Ca⁺⁺	Calcium
CAHAI	Chedoke Arm and Hand Activity Inventory
CAP	Compound action potential
CBM	Cannabis-based medicine
CER	Cerebellum
CMAP	Compound motor action potential
CI therapy	Constraint Induced therapy
CNS	Central nervous system
CT	Computed tomography
DRT	Dorsal reticulospinal tract
EMG	Electromyography
FAS	Functional Ability Score
FAT	Frenchay Arm Test
FGF-2	Fibroblast growth factor-2
FEAT	fMRI Expert Analysis Tool
FLAIR	Fluid-attenuated inversion recovery
fMRI	Functional Magnetic Resonance Imaging

FMRIB	Functional Magnetic Resonance of the brain
GABA	Gamma-aminobutyric acid
H-reflex	Hoffman reflex
K⁺	Potassium
M1	Primary motor area
MAS	Modified Ashworth Scale
MRC	Medical Research Council
MRI	Magnetic Resonance Imaging
MRT	Medial reticulospinal tract
Na⁺	Sodium ions
NMDA	N-methyl-D-aspartate
NPCs	Neural progenitor cells
PDGF	Platelet derived growth factor
PET	Positron emission tomography
PMA	Primary motor area
PNF	Proprioceptive neuromuscular facilitation
RIA	Reticular inhibitory area
ROC	Receiver operating characteristic
ROM	Range of motion
RST	Reticulospinal tract
S1	Primary sensory area
S2	Secondary sensory area
SSC	Somatosensory cortex
SEPs	Somatosensory evoked potentials
SIS	Stroke Impact scale
SLP	Stationary lumbar potential
SMA	Supplementary motor area
SNAP-25	Synaptosomal-associated proteins 25 kDa
SNAREs	Soluble N-ethylmaleimide-sensitive factor attachment protein receptors

SPASM	Support Program for Assembly of database for Spasticity Measurement
TENS	Transcutaneous nerve stimulation
TH	Thalamus
UMNS	Upper Motor Neuron Syndrome
VAMP	Vesicle-associated membrane protein
VEGF	Vascular endothelial growth factor
VST	Vestibulospinal tract
We Move	Worldwide Education and Awareness for Movement Disorders
WHO	World Health Organization
WMFT	Wolf Motor Function Test

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