Cognitive Dysfunction in Hemodialysis Patients

Thesis

Submitted for Partial Fulfillment of Master Degree
in Neuropsychiatry

By

Hosni Mohammed Abd El Bar Mohammed
M.B.B.Ch
Faculty of Medicine – Bani Sweif University

Under Supervision of

Prof. Dr. Taha Kamel Taha Alloush
Professor of Neurology
Faculty of Medicine - Ain Shams University

Prof. Dr. Yousry Aboel-Naga Abdel-Hamid
Professor of Neurology
Faculty of Medicine - Ain Shams University

Dr. Sherien Mohamed Farag
Lecturer of Neurology
Faculty of Medicine - Ain Shams University

Faculty of Medicine
Ain Shams University
2016

Acknowledgement

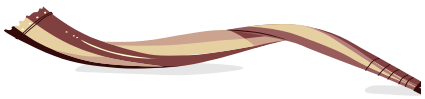
First and foremost, I would like to begin by thanking **ALLAH,** Most Strong, All Almighty, for providing me the strength and perseverance required to achieve this work.

I would like to express my deep gratitude to **Prof. Dr. Taha Kamel Taha Alloush,** Professor of Neurology, Faculty of Medicine, Ain Shams University, for his helpful and constructive suggestions, and for the continuous encouragement that he generously offered during this work.

I am also very grateful to **Prof. Dr. Yousry Aboel-Naga Abdel-Hamid,** Professor of Neurology, Faculty of Medicine, Ain Shams University, for his great and smart guidance and supervision of this work; also he devoted much of his precious time and effort in order to achieve this work in a successful form.

I would like to thank to **Dr. Sherien Mohamed Farag,** Lecturer of Neurology, Faculty of Medicine, Ain Shams University, for her guidance and suggestions which were of great value to me.

Special thanks to my family and my Friends who helped me and provided me the personal support in completing this work.



Contents

List of Abbreviations

Abb.	Description
AD	Alzheimer's disease
AKI	Acute kidney injury
AMPA	Amino-3-hydroxy-5-methyl-soxazolepropionic acid
APOE-4	The APOE-4 allele
BMI	Basal metabolic index
BP	Blood pressure
Ca	Serum calcium
CAPD	Continuous ambulatory peritoneal dialysis
CKD	Chronic kidney disease
CKD5D	Chronic kidney disease stage 5 dialysis
CKD-MBD	Chronic kidney disease-mineral and bone disorder
COWAT CF	Controlled oral word association test-category fluency
COWAT CS	Controlled oral word association test-category switching
CST	Cognitive stimulation therapy
CT	Computerized tomography
CVD	Cardiovascular disease
DKD	Diabetic kidney disease
DM	Diabetes mellitus
DVT	Deep venous thrombosis
EEG	Electroencephalogram
ESRD	End-stage renal disease

Abb.	Description
FAB	Frontal assessment battery
GBD	Global burden of disease
GFR	Glomerular filtration rate
HD	Hemodialysis
HDL	High-density lipoprotein
HRBNT	Halstead reitan battery of neuropsychological test
HTN	Hypertension
IHD	Ischemic heart disease
Il-6	Interleukin factor 6
IQs	Intelligence Quotients
KBDI	Korean beck depression index
KDIGO	Kidney disease: improving global outcomes
KMMSE	Korean mini-mental state examination
MCI	Mild cognitive impairment
MMSE	Mini-mental state examination
MRI	Magnetic resonance imaging
NMDA	N-methyl-daspartate
non-CKD	Non chronic kidney disease
P	Serum phosphorus
PD	Peritoneal dialysis
PH	Past history
PTH	Parathyroid hormone
ROD	Renal osteodystrophy
RRT	Renal replacement therapy
T1	Time 1

Abb.	Description
T2	Time 2
T3	Tri-iodo-thyronin
T4	Tetra-iodo-thyronin
tHcy	Homocysteine
TIA	Transient ischemic attack
TMT A	Trail making test A
TMT B	Trail making test B
US	United states
VLDL	Very-low-density lipoprotein
WMS-R	Wechsler memory scale revised

List of Tables

List of Figures

Abstract

Background: Chronic kidney disease (CKD) is a worldwide growing health problem that is frequently associated with cognitive deficits. **The aim of our study** was to characterize the pattern of cognitive functioning of adults with CKD on regular hemodialysis. We also aimed to evaluate the potential effect of a single dialysis session on cognitive function. **Subject and methods:** Our study included thirty CKD patients on regular hemodialysis and twenty comparison subjects matched for age, sex and education and co-morbid conditions. To assess changes over the dialysis cycle, we assessed HD patients immediately before and again 24 hours post-dialysis. **The results**: regards MMSE all patients had normal results, as regards trail A 93% of patients had abnormal results, as regards trail B 67% of patients had abnormal results, as regards logical memory A 43% of patients had abnormal results, and regarding logical memory B 13% of patients had abnormal results. A highly significant cognitive impairment detected in hemodialysis patients regarding memory, attention and executive functions compared to non CKD individuals. However, a single dialysis session improved several aspects of cognitive function. **Conclusion:** Our findings demonstrated that among adults with CKD5D, lower cognitive performance is common, compared with non-renal subjects. Even more severely affected were executive functions. In addition, this study showed that a single dialysis session improves several aspects of cognitive function.

Keywords: Conginitive impairment, Hamodialysis, Chronic kidney disease.

Introduction

Aim of the Work

Chapter (1)

Cognition

Chapter (2)

Chronic Kidney Disease and Hemodialysis