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Neurocognitive Functions and Psychosocial Assessment in Children with Chronic Renal Disease

Thesis

*Submitted for partial fulfillment of M.D. Degree in **Pediatrics***

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قَالُوا

سُبْحَانَكَ لَا عِلْمَ لَنَا
إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ
الْعَلِيمُ الْحَكِيمُ

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ABSTRACT

Background: Chronic kidney disease (CKD) in children is a major global health problem. They are at risk for developing cognitive functions impairment more than adults due to the development of CKD during crucial stages of brain development.

Study Aim: To assess the neurocognitive status in children with CKD stages 2-5 and their educational outcomes.

Methods: A cross sectional study was conducted on 75 patients with CKD, & 25 controls. Neurocognitive status was assessed using WIQ (Wechsler Intelligent Quotient), Benton Visual Retention Test (BVRT), computerized Wisconsin Card Sorting Test (WCST) and structural MRI Brain.

Results: Children with CKD had significantly lower total, verbal, performance IQ as compared to healthy controls. CKD patients had a disability at visual memory and attention denoted by worse performance at BVRT. Scores of CKD patients at WCST were worse than the control, thus denoting a disability at brain executive function. For MRI white matter lesions were reported in 2 patients on regular hemodialysis.

Conclusions: Children with CKD may have average to low-average cognition compared with the general population, with significant deficits at educational outcomes, visual memory, attention, & executive function.

Limitations: We could not assess the longitudinal change in cognitive functions with advancing CKD, as the study was a cross sectional one with relatively small sample size.

Implication of Practice: This study highlighted the importance of implementing changes in the routine care of children with CKD encouraging better nutrition and educational programs.

List of Contents

Title	Page No.

List of Tables

Table No.	Title	Page No.

i

List of Tables

Table No.	Title	Page No.

List of Tables

Table No.	Title	Page No.

List of Tables

Table No.	Title	Page No.

List of Figures

List of Figures (Cont...)

List of Abbreviations

Abb.	Full term
AAS	Anterior Attentional System
ACEI	Angiotensin Converting Enzyme Inhibitors
AR	Arithmetic
ARB	Angiotensin receptor blocker
ASL	Arterial Spin Label
AV	Arteriovenous
BBB	Blood Brain Barrier
BD	Block Design
BP	Blood pressure
BRIEF	Behavior Rating Inventory of Executive Function
BUN	Blood Urea Nitrogen
BVRT	Benton Visual Retention Test
CAKUT	Congenital Anomaly of Kidney and Urinary Tract
CBC	Complete Blood count
CBF	Cerebral blood flow
CD	Coding
CDI	Children Depression Inventory
CI	Confidence Interval
CKD	Chronic kidney disease
CMAS	Children's manifest anxiety scale
CNS	Central nervous system
CO	Comprehension
CSF	Cerebrospinal fluid
CVVH	Continuous veno-venous hemofiltration
DS	Digit Span
DSM	Diagnostic and Statistical Manual of Mental Disorders
DWI	Diffusion weighted image