

The Burden of Cognitive Impairment in Patients With End-Stage Renal Disease and Impact on Dialysis Modality Choice

A. Jayanti¹, P. Foden², P. Brenchley¹, A. Wearden³ and S. Mitra¹

¹Renal Research Division, Central Manchester University Hospitals NHS Trust, Manchester, UK; ²Department of Biostatistics, University of Manchester, Manchester, UK; and ³School of Psychological Sciences, University of Manchester, Manchester, UK

Introduction: Kidney disease is associated with significant cognitive dysfunction. Subjective reports of cognitive ability have not been studied extensively in chronic kidney disease. We investigated the association between objective and subjective cognitive functions in predialysis patients and their association with self-care dialysis modality choice.

Methods: Cross-sectional data from the BASIC-HHD study were used for the study of cognition in 220 predialysis patients. The data were used to ascertain the demographics, clinical, laboratory, and neuropsychometric variables. The latter includes Trail Making Tests (TMT) parts A and B, Modified Mini Mental State Examination, and metacognition questionnaire for subjective assessment of one's cognitive ability. The outcome variable was fully assisted and self-care dialysis modality choice.

Results: Within the study cohort, 90 patients chose fully assisted hemodialysis and 114 patients chose self-care dialysis. The median Modified Mini Mental State Examination, TMT part A, and TMT part B scores were greater for the assisted versus the self-care group. Metamemory was not significantly different between groups, but the metaconcentration score was significantly worse in the group choosing assisted dialysis. Higher (i.e., better) metaconcentration scores were significantly associated with the self-care modality choice in the univariate and hierarchical regression analyses. Adjusted and unadjusted analyses showed a significant association between perceived concentration and TMT part B scores ($P < 0.01$). With every 1.6-minute increase in TMT part B score, there was a 1-unit reduction in metaconcentration score, and the latter was associated with 20% lower odds of choosing self-care dialysis over a fully assisted dialysis modality.

Discussion: Patients' self-perception of cognitive ability is a significant predictor of self-care dialysis modality choice. Subjective report of "metaconcentration" is also strongly associated with poorer outcome on the TMT part B.

Kidney Int Rep (2016) ■, ■-■; <http://dx.doi.org/10.1016/j.ekir.2016.07.010>

KEYWORDS: cognition; ESRD; predialysis

© 2016 Published by Elsevier, Inc., on behalf of the International Society of Nephrology. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Chronic kidney disease (CKD) is a worldwide public health issue.^{1,2} Cognitive deficits in CKD patients are increasingly being recognized as a major problem, with a 3-fold increase in this group compared to that in the general population.³ The management of cognitive deficits very early in the course of CKD is desirable, as more advanced stages of kidney disease are associated with greater impairment of cognitive function.⁴ In 1 study, participants with mild, moderate, and severe renal impairment were compared, and the authors

concluded that for every 10-ml/min decrease in estimated glomerular filtration rate, the risk of cognitive dysfunction increased by 15% to 25%.⁵ This issue is more of a problem in older individuals and in those established on dialysis, with a prevalence of cognitive impairment in hemodialysis patients estimated to be about 30% to 70%.⁶ The presence of cognitive impairment in this cohort is also associated with higher mortality.^{7,8} The pathogenesis of the accelerated cognitive decline in CKD is attributable to vascular injury from traditional risk factors, and from direct neuronal toxicity of uremic retention solutes.⁹ It is believed that microvascular disease of the brain is responsible for the pattern of cognitive deficits seen in kidney disease and that it is related to the patients' vascular risk profiles. This is typically manifest as impaired executive brain function.

Correspondence: Anuradha Jayanti, Department of Nephrology, Manchester Royal Infirmary, Oxford Road, Manchester, United Kingdom M13 9WL. E-mail: anu.5577@yahoo.co.in

Received 9 June 2016; revised 16 July 2016; accepted 27 July 2016; published online 10 August 2016

52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100
101
102

The focus on cognition in CKD is extremely important, as the notion of self-care dialysis relies on cognitive intactness. Patient participation, patient choice, and patient-led decision making are associated with better outcomes and are therefore considered best clinical practice.^{10–12} There is greater impetus for self-management of long-term conditions,^{13,14} but the cognitive context in which such decisions are made by patients is not well understood and merits further research. This applies to both objective cognitive deficits and patients' assessment of their own cognitive ability (subjective cognitive ability). The latter is grossly underrepresented in kidney disease literature.

Few studies have been published to date, in regard to patients with kidney disease, that specifically seek to examine the association between subjective and objective cognition assessments.^{15,16} The Kidney Disease Quality of Life (KDQOL)—CF subscale with 3 questions was shown to be a limited instrument for accurately assessing subjective cognitive function¹⁶ and bore no relationship to the executive function test, most implicated in CKD.^{17–19} More recently, a study found modest correlation between subjective and objective assessments; however, the former was a predictor of the patient's self-reported measure of activities of daily living, although both subjective reports may well be influenced by negative affectivity.^{15,20} In other population groups, subjective assessment of impaired cognition has been associated with poorer health-related quality-of-life, reduced daily functioning,²¹ and increased risk of hospital attendance,^{22,23} and is also predictive of future cognitive decline.^{24–26} In addition, the identification of cognitive impairment is important in order to assist patients in making well-informed treatment decisions, in ensuring treatment compliance, and in helping to prevent functional decline.²⁷ Treatment decision making is multifactorial and includes, among other factors, the patient's and health care professional's perception (whether accurate or not) of the patient's cognitive abilities. The choice of self-care dialysis decisions is expected of patients after information on dialysis modalities is provided to them. Hence, the possibility of the influence of the patients' assessment of how their memory works, and how they judge their own abilities and effectiveness, may predict their choice of dialysis modality.

The aims of the present study are as follows: (1) to assess metacognition in patients with CKD-5 as a measure of subjective cognitive impairment and to explore the association between subjective and objective cognition tests; and (2) to examine associations of dialysis modality choice (fully assisted vs. self-care) with measures of objective (global cognition and

executive brain function) and subjective cognition assessments (memory and concentration).

MATERIALS AND METHODS

Participants and Recruitment

Data for the present study are derived from that ascertained for the BASIC-HHD study.²⁸ The data were prospectively collected for a comprehensive and systematic study of barriers to and enablers of the uptake of self-care dialysis therapy. The study involves 5 centers in the United Kingdom, with variable prevalence rates of home hemodialysis (HD). An integrated mixed methodology (convergent, parallel design) has been adopted for the BASIC-HHD study in a combined cross-sectional and prospective study design. The methodological details and scope of data collected in the BASIC-HHD appear in a published protocol.²⁸ Data presented here are derived from the CKD-5, a predialysis cohort of the BASIC-HHD study. A total of 222 patients were enrolled in this group. Predialysis patients were approached if they fulfilled eligibility criteria and were willing to undertake neuropsychometric assessments and to complete study specific questionnaires.

Study Registration

This study was reviewed and approved by the Greater Manchester West Health Research Authority National Research Ethics Service (NRES) (Reference number: 12/NW/0170). The study is on the NIHR portfolio (ID 12346). Written informed consent from participants was obtained for the study. Psychological measures used in this study were part of compilation of questionnaires. Blood sampling and neuropsychometric assessments were carried out at patients' routine hospital clinic visits. Visually impaired participants were excluded from this analysis ($n = 2$).

Independent Variables

Independent variables included the following: objective tests of cognition, Trail Making Tests (TMT) parts A and B,²⁹ Modified Mini Mental State Examination (3MS),³⁰ subjective assessment of cognition scales (metacognition questionnaire,³¹ demographics (age, sex, ethnicity, education, employment, and marital status); clinical variables (Charlson Comorbidity Index [CCI],³² cause of end-stage renal disease [ESRD], diabetes, heart failure, intracranial vascular events, ischemic heart disease, systolic and diastolic blood pressures); laboratory variables (urea, creatinine, phosphate, parathyroid hormone, bicarbonate, albumin, hemoglobin, and medications including angiotensin-converting enzyme inhibitors, central nervous system-influencing drugs, antidepressants, antiplatelet agents, cholesterol-lowering drugs,

Download English Version:

<https://daneshyari.com/en/article/5689583>

Download Persian Version:

<https://daneshyari.com/article/5689583>

[Daneshyari.com](https://daneshyari.com)