

SCREENING OF EXECUTIVE FUNCTION MORE USEFUL THAN GLOBAL COGNITION ASSESSMENT OF PREDICTION OF MORTALITY IN HEMODIALYSIS PATIENTS

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OBJECTIVES

The main goal of this study was to compare the contribution of impairment in executive function or global cognitive function to predicting mortality, at 2 years of follow-up, in a cohort of clinically stable and adequately dialysed end-stage renal disease (ESRD) patients.

Table 1

Baseline Characteristics of Included Patients

Total (N=104)	
Sociodemographic	
Age (y)	57.61±14.41
Women	55.8% (N=58)
Dialysis vintage (years)	
	9.62±5.50
Laboratory data	
Hemoglobin (g/dL)	11.66±1.50
Albumin (g/dL)	4.11±0.47
CRP (mg/L)	10.27±15.54
Clinical measures	
Kt/v	1.43±0.24
SBP	134.35±17.56
DBP	70.82±14.13
IDWG (kg)	1.72±0.64
Comorbidity	
Diabetes Mellitus (%)	9.6 (N=10)
Cardiovascular disease (%)	28.8 (N=30)

Figure 1

Kaplan Meier Analysis; Survival of Patients With and Without Cognitive Impairment (according to TMTB)

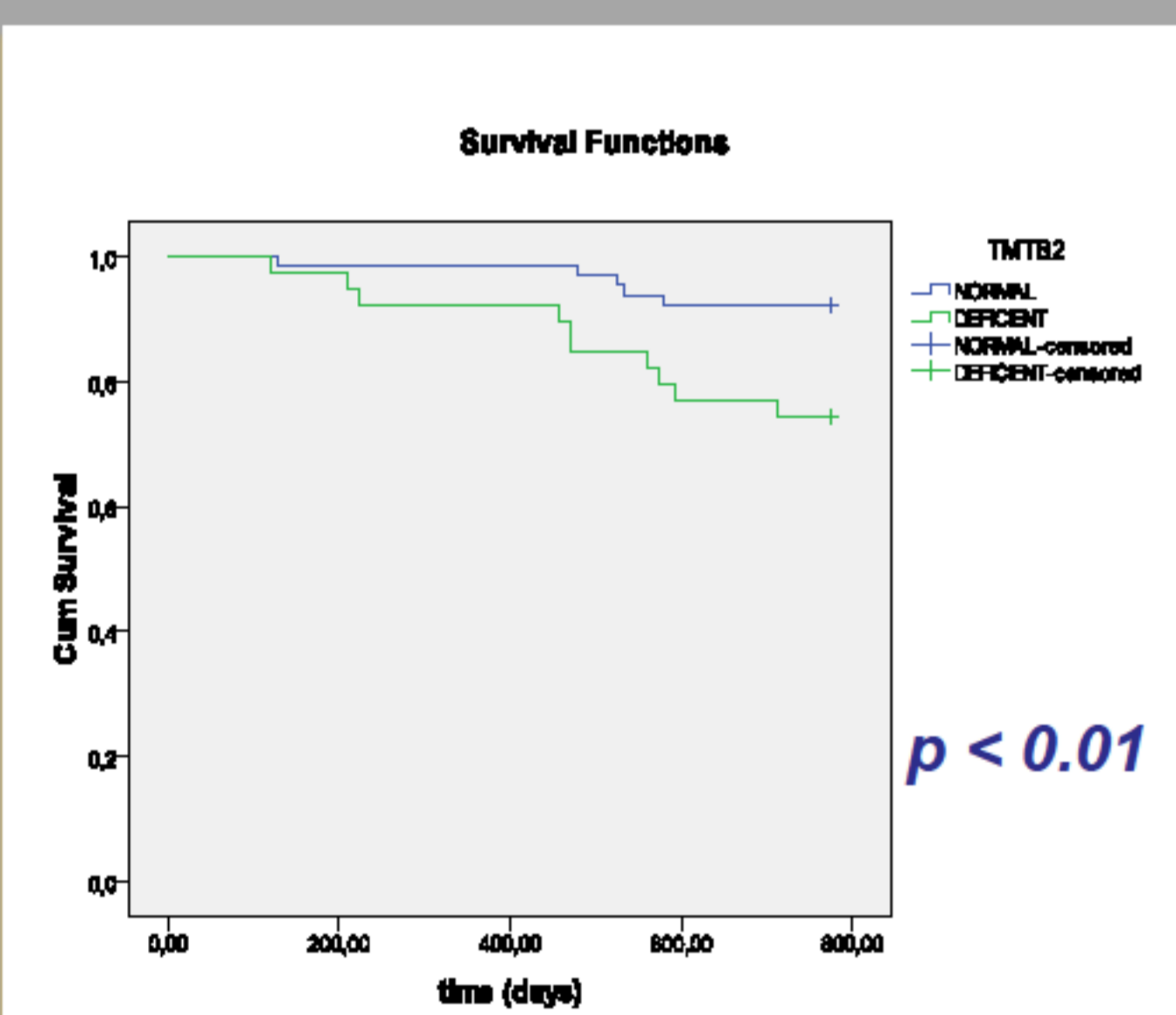


Table 2
Neuropsychological Test Scores of Patients With and Without Cognitive Impairment

NP test scores	Total (N=104)	Cognitive Impairment (N=39)	No Cognitive Impairment (N=65)	P
TMT-B ^a	226.88±119.27	278.71±112.40	156.50±88.76	<0.001
MMSE ^b	25.07±3.40	22.80±2.36	29.18±1.74	<0.001

Abbreviations: TMT-B, Trail Making Test Part-B; MMSE, Mini Mental State Examination
^a time to completion in seconds
^b general score

Table 3
Outcomes (survival) in Patients With and Without Cognitive Impairment (according to MMSE)

	Total (N=104)	Cognitive Impairment (N=70)	No Cognitive Impairment (N=34)	P
Count of deaths (% of deaths)	15 (14.4%)	13 (86.7%)	2 (13.3%)	
Survival time (days)	727.83±135.74	709.90±18.95	764.76±7.71	0.080

Table 4
Outcomes (survival) in Patients With and Without Cognitive Impairment (according to TMTB)

	Total (N=104)	Cognitive Impairment (N=39)	No Cognitive Impairment (N=65)	P
Count of deaths (% of deaths)	15 (14.4%)	10 (66.3%)	5 (33.3%)	
Survival time (days)	727.83±135.74	689.59±27.83	750.78±12.19	0.011

METHODS

- **104** patients (58 females, mean age 57.61±14.41 years) with ESRD treated with long-term thrice weekly hemodialysis has been enrolled from two Romanian dialysis centers and followed up for 2 years (Table 1).
- We applied the **Mini Mental State Examination (MMSE)** (1), for assessing the **global cognitive function**, and **Trail Making Test Part-B (TMTB)** (2), for determining the **executive function**.
- We considered a MMSE score ≤ 27 as being appropriate for indicating even the slightest decline in cognitive performance (defined by Crum, 1993) (3) and a TMTB higher score than 273 seconds reveals greater impairment.

RESULTS

- Mean MMSE score 25.07±3.40 and mean TMTB (sec) was 226.88±119.27 (Table 2). Mean dialysis vintage was 10.79 ± 5.7 years. **70 subjects had global cognitive impairment and 39 had impaired executive function.**
- During the follow-up, **15 (14.4%) patients died.** Of the deceased participants, **13 (86.7%) had impaired at MMSE, and 10 (66.3%) had impaired at TMTB (Table 2).**
- **Main cause of death was cardiovascular disease (14 patients), and 1 patient died due to an infection.** After using Kaplan-Meier method, patients with impaired executive function were at increased risk of death compared with those with no impaired executive function ($p < 0.01$) (Table 4, Figure 1). There were no statistically significant differences between death rates of patients with global cognition impairment and those without global cognition impairment ($p > 0.050$) (Table 5).
- **Executive function was independently associated with mortality.** After adjustment for covariates age and dialysis vintage, executive function was associated with an increased risk of death (HR=1.06, 95% CI 1.01-1.12).

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CONCLUSIONS

- Compared to global cognition assessment, **executive function might be an useful tool for screening cognitive status, and an independent predictor of mortality in hemodialysis patients.**

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