EVALUATION OF THE 1 YEAR FOLLOW UP OF DIALYSIS PATIENTS THROUGH RAPID NEUROPSYCHOLOGICAL SCREENING BATTERY

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Background

In the international literature there is a growing evidence and interest about alteration in cognitive function in patients with renal replacement therapy (RRT). Neuroimaging studies have reported significant strokes, white matter lesions, silent brain infarcts, and microbleeds in nefropathic patients. It seems that the most involved neuropsychological function is the executive domain. In fact, it seems that these types of alterations depend on vascular damage that is often a commorbidity in those pts.

Aims

The aim of the present study is to evaluate the executive domain of dialysis patients after 1 year of follow up through a rapid neuropsychological screening battery.

Methods

We enrolled pts in chronic dialysis (HD or PD) from at least 3 months. Executive functioning was assessed in two time points (T0 baseline and after 1 year) by Montreal Cognitive Assessment (MoCA) that, according to Italian normative data, can be divided into six subtests (Santangelo et al., 2015; Nasreddine et al.,2005). We divided the sample based on Equivalent Score (ES): pathological (0,1 ES) and not pathological (2,3,4 ES).

The test requires about 10 minutes: HD patients did the test before starting the treatment, while PD patients after the regular visit or blood samples.

Data are expressed as mean ± standard deviation, median (25-75th) or expressed as percentage, depending on their distribution. For all the analyses we considered as a significant level $p<0.05$. Statistical analysis was performed with SPSS21 software.

Results

We screened 207 dialysis pts: 133 were enrolled at T0 and, after a median follow-up of 1.02 (0.99-1.09) yrs, 104 were enrolled at T1. Twenty-nine patients dropped out for different reasons (e.g. death, refusal). In the present study we compared only patients that completed the test both at T0 and T1 in order to compare their performance.

The sample was composed of 47 (45.2%) HD pts and 57 (54.8%) PD pts. Seventy one pts (68,3%) were male and 33 (31,7%) were female. After a median follow up of 12 (8-16) months the mean MoCA total score was significantly decreased (T0, 23.47 ± 4.01 vs T1, 22.89 ± 4.15; p= **0.027**). Demographic data and MoCA subtest are shown in the **Table (right side).**

Comparing each domain, we found a significant difference of the percentage of patients (19.2%) that changed from not pathological (2,3,4 ES) to pathological (0, 1 ES) in executive domain from T0 to T1. Indeed, 23,1% of the patients at T0 showed difficulties in executive domain and this percentage went up to 41.3%. Twenty patients (15%) decreased their performance from T0 to T1. Comparing the other domains, there are not any change in the same period of time.

Moreover, we compared the metabolic parameters between T0 and T1 (hemoglobin, creatinine, urea, sodium, potassium, calcium, chlorine, phosphorus, vitaminD, FGF23 protein C reactive, intact PTH, cholesterol and triglycerides) in patients (20 pts) that changed from not pathological to pathological in executive domain in order to understand if the metabolic pathway could explain the worsening of performance, but we did not find any statistical difference.

Demographic data and MoCA subtest s T0 and T1 of patients enrolled

		T0	T1	*p* Value
Demographic	Age (mean ± SD)	61.9 ± 13.50	62.92 ± 13.45	
	Male (%)	71 (68.3%)	71 (68.3%)	
	Scholarship (years)	8 (3 – 22)	8 (3 – 22)	
Total MoCA score	**Total score** (mean ± SD)	23.47 ± 4.01	22.89 ± 4.15	**0.027**
	Pathological (%)	11 (10%)	14 (13.5%)	0.508
Domains	**Visuospatial** Pathological (%)	12 (11.5%)	10 (9.6%)	0.754
	Executive Pathological (%)	24 (23.1%)	43 (41.3%)	**<0.001**
	Language Pathological (%)	18 (17.3%)	16 (15.4%)	0.791
	Attention Pathological (%)	14 (13.5%)	17 (16.3%)	0.581
	Orientation Pathological (%)	12 (11.5%)	13 (12.5%)	1
	Memory (median, IQR)	2 (0 – 5)	2 (0 – 5)	0.543

Conclusions

Total mean MoCA score for the enrolled patients was significantly different between T0 and T1 and it could be due to worsening in executive domain. The other domains, instead, seem to be more stable over this time period. The worsening cannot be due only to metabolic disturbance, because these parameters remained stable during this period of time. Therefore the metabolic pathway is not the only one that could explain worsening in executive function. Future research is needed in order to understand the evolution over a longer period of time and also in order to understand the impact of the renal replacement therapy in this topic.

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