

Qualitative aspects of Rey-Osterrieth Complex Figure Test performance in patients with Progressive Supranuclear Palsy

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Introduction: Copy of Rey-Osterrieth Complex Figure (ROCF) is a drawing test considered a complex neuropsychological task requiring multiple cognitive abilities (e.g. visuo-spatial, executive function, attention, fine-motor coordination). The scoring system commonly used is the quantitative 36-point scoring system. Recently some studies showed that this score was able to differentiate Progressive Supranuclear Palsy (PSP) from Parkinson's disease (PD) patients [1,2], however without providing information about underlying impaired cognitive process. In this context, qualitative analyses of ROCF may be relevant.

Objectives: Our work aimed at examining which qualitative aspects of ROCF copy is the most useful in discriminating PSP-Richardson Syndrome (PSP-RS) from PD and healthy control (HC). Furthermore, we were interested in evaluating the predictive validity of PSP-RS diagnosis according to different scoring system (quantitative vs qualitative).

Methods: Thirty PSP-RS subjects, 30 PD patients and 30 HC matched for age, education and gender were enrolled. No differences in disease duration between PSP-RS and PD were found (respectively 3.2 ± 1.7 ; 2.9 ± 1.7). All subjects underwent a neuropsychological evaluation; ROCF copy were evaluated with quantitative and qualitative (Boston Qualitative Scoring System-BQSS) scoring system.

Results: PSP-RS performed worse in ROCF quantitative score, as expected, and in different BQSS scores ($p < .05$). Using a logistic regression model, the most suitable scores discriminating PSP-RS from PD and from HC were "Perseveration" and "Vertical Expansion". These BQSS scores showed better predictive validity of PSP-RS diagnosis than standard quantitative score.

Conclusions: We found that "Perseveration" and "Vertical Expansion" BQSS scores are useful in discriminating PSP-RS from PD and HC. These scores could be underlined by a motor inhibitory deficit distinctive of PSP-RS patients. "Perseveration" and "Vertical Expansion" BQSS scores could be included in the cognitive evaluation along with quantitative scores when PSP diagnosis is considered.

References

- [1] G. Santangelo, S. Cuoco, M.T. Pellicchia, R. Erro, P. Barone, M. Picillo. (2018). Comparative cognitive and neuropsychiatric profiles between Parkinson's disease, multiple system atrophy and progressive supranuclear palsy. *Journal of neurology*, 265(11), 2602-2613.
- [2] C. Pellicano, F. Assogna, N. Cellupica, F. Piras, M. Pierantozzi, A. Stefani, G. Spalletta. (2017). Neuropsychiatric and cognitive profile of early Richardson's syndrome, Progressive Supranuclear Palsy-parkinsonism and Parkinson's disease. *Parkinsonism & related disorders*, 45, 50-56.