

Assessing planning skills and executive functions in the elderly: preliminary normative data for the Tower of London Test

Avaliação das funções executivas e habilidades de planejamento no idoso: referencial normativo preliminar para o Teste da Torre de Londres

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Executive functions are cognitive processes related to planning, execution, and analysis of objective-guided behavior usually associated with fronto-striatal neurocircuitry¹. The planning skills are one of the executive functions associated with the sequencing of steps aiming a nonimmediate objective. A classical measure of planning skills is the Tower of London Test (TOL), developed by Shallice² and adapted by Krikorian³, frequently used in clinical and research settings. Although usually adopted as a measure of executive functions, there are no normative data for the Brazilian elders. The objective of this study was to develop preliminary normative data for the TOL (Krikorian version).

In the city of Belo Horizonte, in Minas Gerais State, Brazil, 305 elderly participants were invited for this study. All of them answered a semistructured interview aiming the exclusion

of neurologic and psychiatric disorders. The inclusion criteria were: Mini-Mental State Exam score above the cutoff for cognitive impairment based on education; score “zero” on the Clinical Dementia Rating; lack of functional impairment on the Katz and Lawton daily life activities indexes; and Geriatric Depression Scale score below the cutoff for depression.

The TOL was applied and corrected based on Krikorian's³ method. The subject receives a wood tower with three pins (large, medium or small) and three balls (red, green or blue), starting from a fixed position he/she must move the balls, one at a time, matching stimulus showed in a card (12 problems), with the minimum moves required (from 2 to 5). If he/she cannot do it or perform with more moves than the minimum required, such person is asked to try it again. Three attempts are given for each problem. The scores are three points for one

Table. Description and neuropsychological assessment of the participants.

Sociodemographic data and tests scores	Age <80, education <8	Age <80, Education >8	Age >80, Education <8	Age >80, Education >8
	n=102 (75 M) Mean (SD)	n=110 (75 M) Mean (SD)	n=49 (26 M) Mean (SD)	n=44 (23 M) Mean (SD)
Age	69.44 (5.47)	69.69 (5.59)	83.33 (2.73)	84.21 (2.60)
Education	4.13 (1.29)	11.85 (2.91)	4.97 (2.06)	12.13 (1.92)
MMSE	26.75 (3.09)	28.36 (2.67)	26.10 (2.85)	26.58 (2.55)
CDT	3.43 (1.28)	4.07 (1.04)	3.51 (1.10)	3.71 (1.27)
TOL total score	29.88 (3.78)	31.16 (2.78)	27.17 (3.52)	28.67 (3.73)
TOL minimum	14	23	22	23
TOL maximum	33	36	36	34
TOL median	30	31	28	29
TOL percentile 10	25	27	27	23
TOL percentile 25	28	30	26	25
TOL percentile 50	30	31	31	29
TOL percentile 75	32	33	32	32
TOL percentile 90	34	35	35	35

SD: standard deviation; M: male; TOL: Tower of London; MMSE: Mini-Mental State Exam, CDT: Clock Drawing Test.

attempt, two for two attempts, one for three attempts, and none if the problem cannot be solved with three attempts.

Descriptive analysis of the participants was performed and then linear regression analysis was used for assessing the influence of age, education, and gender on test performance. Group comparisons (performed by one-way ANOVA) were used for determining the normative data divisions. Statistical significance was established at 0.05.

The participant's description and test performance are shown in Table. The linear regression model was significant ($F=7.00$, $p<0.001$, $R^2=0.07$), showing influence of age ($\beta=-0.19$, $p=0.001$) and education ($\beta=0.18$, $p<0.001$) on test performance, but not of gender ($p>0.05$). The ANOVA results suggested a normative data division based on age and education,

since the proposed age-education groups presented significant differences ($F=8.59$, $p<0.01$, $\eta^2=0.07$).

The TOL is a well-validated classical neuropsychological test for the assessment of planning skills. As other studies suggested, age and education were related to task performance⁴. The development of adequate normative data is essential for cognitive assessment in clinical setting. When a precise characterization of executive/planning performance is necessary, as in the assessment of different conditions like dementia, neuropsychiatry disorders, and mild cognitive impairment, stratified data for sociodemographic factors as age and education allow a more accurate interpretation of test performance and neuropsychological hypothesis testing in the clinical setting⁵.

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Ibuprofen-induced unilateral optic neuritis

Neurite óptica unilateral induzida por ibuprofeno

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Visual disturbances have been reported to occur as side effects from ibuprofen (2-4'-isobutylphenyl-propionic acid) in therapeutic dosages, in <1% of the cases¹⁻³. The most common visual disturbances include amblyopia, scotomata, or changes in color vision³. Also, the contrast sensitivity may be depressed at low spatial frequencies during treatment with ibuprofen, 800 mg/d³. Visual side effects occur more frequently in adults as compared to children and they are dose-dependent⁴.

CASE REPORT

A 61-year-old Caucasian female, referred by the department of ophthalmology for acute and constant visual deficit

(Fig 1), and papillary edema on the right eye for one week. She took ibuprofen 1,600 mg/d during seven days for lumbalgia. At the last day of ibuprofen administration, the patient experienced visual deficits on the right eye, which she described as blurring and dimming. Initially, she went to her ophthalmologist who found a visual acuity of -0.5 (left) and -0.5 (right) and fuzzy papilla, and referred her to a secondary ophthalmology center, which found a prominent right papilla due to edema and swelling (Fig 2), but did not reveal an ophthalmologic cause of the abnormality either. To exclude a central nervous system lesion, she was referred to the neurologist.

Her history was uneventful except for recurrent lumbalgia, and her family history was noteworthy only for scleroderma in her sister. She did not take any regular medication.