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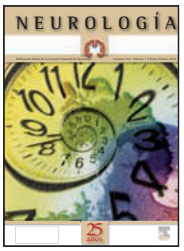

ORIGINAL ARTICLE

Validation of the Pascual Graphomotor Test in Cuban school children

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Abstract
Introduction: The ability to draw is a complex perception and cognition function, which is acquired in infancy and is not usually investigated in the neuropaediatric clinic.
Objective: To validate the Pascual graphomotor test (PGT) in 5 to 11 year-old Cuban school children.
Patients and methods: The PGT was performed on a total of 172 children from the city of Havana Círculo Infantil del Municipio Plaza nursery school and from the 1st to 5th year of a primary school in the same area. The sample was systematic. The test was repeated the following day. All the drawings were scored blind by a neurologist and neurology resident.
Results: For the validation of the test the differentiation with age and school year was taken as a validation criterion. A high correlation was obtained between the ages of the children and the scores obtained. The Spearman coefficient was −0.78 (P=0.01), and a there was a similar inverse correlation between the school year and the test scores (Spearman coefficient=−0.79, P=0.01). The test was very reliable, with an intraclass correlation coefficient (ICC) of 0.99 for inter-observer agreement and 0.97 for the test-retest.
Conclusions: The test was valid according to the criterion employed, differentiation with age and school year. The PGT demonstrated good temporal and inter-observer stability. We believe that it is a very useful tool in the neurological examination of Cuban school children.

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PALABRAS CLAVE
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Test psicométrico;
Trastorno visuoconstructivo

Validación del test grafomotor de Pascual en niños escolares cubanos

Resumen
Introducción: La capacidad para dibujar constituye una función practognósica compleja, que se adquiere en la infancia y que no suele explorarse asiduamente en la consulta neuropediátrica.
Objetivo: Validar el test grafomotor (TGM) de Pascual en escolares cubanos de 5 a 11 años.
Pacientes y métodos: Realizaron el TGM un total de 172 niños pertenecientes al preescolar de un Círculo Infantil del Municipio Plaza de Ciudad de la Habana y los que cursaban del primer al quinto grado en una escuela primaria de esta misma área. El muestreo fue sistemático. El test se repitió al siguiente día. Todos los dibujos fueron puntuados a ciegas por un neurólogo y una residente de neurología.
Resultados: Para la validación del test se tomó como criterio de validación la diferenciación con la edad y el curso escolar. Se obtuvo una alta correlación entre las edades de los niños y las puntuaciones obtenidas (coeficiente de Spearman = −0,78; $p < 0,01$) y similar correlación inversa entre el curso escolar y las calificaciones del test (coeficiente de Spearman = −0,79; $p < 0,01$). El test resultó muy fiable, siendo el coeficiente de correlación intraclase (CCI) para la concordancia interobservador de 0,99 y para el test-retest de 0,97.
Conclusiones: El test fue válido de acuerdo al criterio empleado de diferenciación con la edad y el curso escolar. El TGM demostró una gran estabilidad temporal e interobservador. Consideramos que es un instrumento muy útil en la exploración neurológica del niño en edad escolar en Cuba.

Introduction

The basic function of psychological tests is to measure differences between individuals or within the same individual at different times. It is therefore clear that psychological tests are commonly used to solve a wide range of practical problems, as well as for important roles in research.[1]

There are several diagnostic tests developed for the maturity level of children. Historically, the most notable among them is that of drawing human figures, created by Goodenough (1926), which has been used both as a test of mental maturity and personality.[2] In our environment, the most commonly employed are the Bender test (developed by Lauretta Bender in 1938[3,4]), the Rey test (created by Rey in 1942[5]) and the visual-motor integration (VMI) developmental test (designed by Beery in 1982[6]). All these tests require the child to copy geometric shapes and the failures or successes are then scored. The scores are given as direct scores or typical scores (making the mean 100 points and the standard deviation [SD] 15) as with psychometric tests. Using these measures, neuropsychologists can guide the rehabilitation of patients who have been affected cognitively. Neuropsychological testing is more sensitive to the functional consequences of brain injury than conventional neuroimaging studies. However, neuropsychological tests are of limited usefulness by themselves and should be interpreted in conjunction with clinical and neuroimaging information, as well as complementary laboratory tests.[7]

The act of drawing is a complex praxic-gnosic function, which is acquired during childhood. Its performance is influenced by visual perception, the integration of varied visual information (visual-motor integration), practical skills and fine motor execution. A test that measures this capability in consultation is of extraordinary neuropediatric value.[8]

Although there are tests to measure visual-perceptual and fine motor skills in children, these are applied individually and require the investment of time by the examiner for each patient, thus limiting their daily use in neuropediatric consultation. Consequently, our study aim was to validate the Pascual graphomotor test (a user-friendly tool, for both individual and collective use, that is quick (it takes less than 10 minutes), appeals to children and is easy to score) so it can be commonly used in neuropsychological examination, or even by educators, for the early detection of students with problems in the acquisition of these skills.

The Pascual graphomotor test has previously been validated in normal school populations, in Spain and Peru,[8,9] and has been used in children of different neuropsychiatric conditions.[10,11] However, as it is compared with the age criterion, it is only valid under the environmental conditions in which it was established, that is, it cannot be assumed that this criterion is universal.[1] This forces us to validate it under our own conditions if we wish to consider it as a screening instrument for these alterations.

We present the results obtained from applying the test to a number of Cuban children pf normal mental and