



Identification of attention-deficit-hyperactivity disorder and conduct disorder in Mexican children by the scale for evaluation of deficit of attention and hyperactivity

Elizabeth Zambrano-Sánchez^a, José A. Martínez-Cortés^b, Yolanda del Rió-Carlos^c,
Ma. del Consuelo Martínez-Wbaldo^d, Adrián Poblano^{a,*}

^a Laboratory of Cognitive Neurophysiology, National Institute of Rehabilitation, Mexico City, Mexico

^b Department of Neurological Rehabilitation, National Institute of Rehabilitation, Mexico City, Mexico

^c Department of Integral Rehabilitation, National Institute of Rehabilitation, Mexico City, Mexico

^d Department of Epidemiology, National Institute of Rehabilitation, Mexico City, Mexico

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ABSTRACT

The objective was weighing the usefulness of a Spanish-language Scale for the evaluation of deficit of attention and hyperactivity (EDAH) to identify children with attention deficit-hyperactivity disorder (AD-HD) and conduct disorder (CD) in a sample of school-aged children. We studied 132 children from a government-run public elementary school previously selected by teachers as having learning and attention disorders. We screened children of the sample with parents' and teachers' EDAH and Diagnostic and Statistical Manual of Mental Disorders-IV edition Text Revision (DSM-IV-TR) questionnaires, and performed an interdisciplinary clinical examination for the final diagnosis. We found 81 children with AD-HD and 51 children without AD-HD. AD-HD was classified as follows: AD-HD-combined (-C), $n = 32$; AD-HD-inattentive (-I), $n = 17$ and AD-HD-hyperactive (-H), $n = 32$. Cronbach's alpha calculation for the EDAH parents' questionnaire was 0.76, and for teachers, 0.80. Sensitivity of the teachers' EDAH questionnaire was 0.94, and specificity, 0.91. Sensitivity of the parents' EDAH questionnaire was 0.91, while specificity was 0.87. The data of EDAH parents' and teachers' questionnaires have a concordance of 93.1% and 80%, respectively. The correlation of scores among parents' and teachers' EDAH scales was significant. The correlation between results from parents' and teachers' DSM-IV-TR and EDAH questionnaires was also significant. Our results partially support the use of EDAH questionnaires for AD-HD and CD screening in Spanish-speaking populations.

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1. Introduction

Attention deficit-hyperactivity disorder (AD-HD) is characterised by severe deficits in attention control, impulsivity and hyperactivity. AD-HD is mainly observed in childhood, but may exert continuous and residual effects in adults (Gotlieb and Gotlieb, 2009). Early detection of children with AD-HD at the preschool age is very important if we contemplate the avoidance of the negative consequences and sequelae in health and psycho-social areas concerning the lack of treatment in toddlers and adolescents while they grow into adulthood (Willoughby et al., 2000; Harvey et al., 2009).

There are few studies on sensitivity, specificity and other predictive measurements in the development of tests in the Spanish language to identify children with AD-HD (Farre Riba and Narbona

García, 2001; Almeida-Montes et al., 2006). The majority of tests for identifying AD-HD in Spanish-speaking children are translations from English-language versions of the tests (Poblano and Romero, 2006). However, translations of tests developed initially in English are not always the best selections for this population because the tests are not adapted to customs or idiosyncrasies, and are not always understood by the children examined. Thus, it is necessary to test questionnaires developed in Spanish, and afterwards to examine whether the constructs are able to detect early AD-HD in Spanish-speaking child populations.

Children diagnosed with AD-HD can present different co-morbidities, such as oppositional defiant disorder (ODD), learning disabilities (LDs), social disorder, (SD), conduct disorder (CD) or others (Wilens et al., 2002). Specifically, CD is characterised by a persistent violation of social rules and the rights of others (Keenan and Wakschlag, 2002; Wilens et al., 2002). CD has four main presentations: (1) aggressiveness towards other subjects or animals; (2) destructiveness of the property of others; (3) lying and stealing and (4) violation of the rules of different social groups. The difference between CD and AD-HD is

* Corresponding author. Calzada México-Xochimilco 289, Col. Arenal Guadalupe, Deleg. Tlalpan, cp 14389, Mexico City, Mexico. Tel.: +52 55 5489 6599.

E-mail address: drdyslexia@starmedia.com (A. Poblano).

that children with AD-HD can break social rules, but they are not disruptive, while children with CD are disruptive. Moreover, in children with AD-HD, hyperactivity is related to attention disorder, while in children with CD, hyperactivity is not related.

Due to the previously mentioned points, it is very important to identify children with AD-HD and CD as early as possible to prevent complications and the negative attitudes of parents, teachers and other people in society towards them. Although there are different questionnaires for screening children with AD-HD, few have been developed primarily in the Spanish language for use in Hispanic and American populations. The scale for evaluation of deficit of attention and hyperactivity (EDAH) contains some of the main American Psychiatric Association (APA) criteria items of the Diagnostic and Statistical Manual of Mental Disorders-IV edition-Text Revision (DSM-IV-TR) recommended to aid in identifying children with AD-HD and CD, and may suggest the existence of these. It was constructed in the Spanish language in an easy-application format for examiners and responders. The test does not require complicated commands. The EDAH test also has a questionnaire for teachers (Farre Riba and Narbona García, 2001).

The test developed must be specific for sensitivity to the identification of AD-HD and CD in children. The test must be supported by knowledge of the theoretical basis of the problem to be studied. The test will yield data on the quantitative or qualitative criteria of the main clinical variables necessary for the diagnosis and management of individuals or groups under investigation (de Vet et al., 2003). In this article, we assessed the usefulness of parents' and teachers' EDAH scales for screening children, who may fulfil criteria for AD-HD and CD with the objective of providing early treatment and avoiding the long-term scholastic and social complications of the disorder. The scale had been studied in Spain and other Spanish language-speaking countries (Blázquez-Almería, et al., 2005; Sánchez-Encalada and Damián-Díaz, 2009), and was translated into Portuguese (Schilling-Poeta and Rosa-Neto, 2004); but, the results of EDAH testing in other Spanish-speaking, school-aged populations of other countries may make important contributions to understanding the validity of the test. We measured the validity of EDAH to detect AD-HD and CD in a group of Mexican children.

2. Methods

2.1. Subjects

We studied 132 children, 98 males and 34 females, residing in the metropolitan area of Mexico City and in the neighbouring State of Mexico. These children come from the low- and middle-income strata and attend a government-run public elementary school. The EDAH and DSM-IV-TR scales were sent to teachers and parents by school principals as a part of an integral examination of some children with behavioural problems due to the suspicion of scholastic learning disabilities.

Subjects participating in the investigation were those aged between 7 and 12 years, with a suspicion of hyperactive and inattentive behaviour, presence of learning disabilities or disruptive behaviour in the classroom and at home. Inclusion criteria for the research was to have a diagnosis of AD-HD only after a comprehensive multidisciplinary clinical diagnosis protocol that included the opinion of parents and teachers and interviews with the psychologist, neurologist and psychiatrist. Exclusion criteria comprised mental deficiency, epilepsy, deafness, blindness, autism or other neurologic or psychiatric alterations, and not having another severe disease with absenteeism in the classroom. After the final diagnosis, we formed two groups: the first, with identified AD-HD and a control group without AD-HD.

Both questionnaires (DSM-IV-TR and EDAH) were explained in an easy but exhaustive manner to teachers and parents prior to their response. Questionnaires were sent to teachers and parents to be answered for each child, underscoring that the teacher must know the school activities and performance of each child in the study sample. On the other hand, we made clear to the parents that alterations must persist for >6 months, and that the alterations must be sufficiently severe enough to be noted as compared with the behaviour of their peers. All children of the sample were exhaustively studied by means of clinic neurologic (Touwen, 1986), psychiatric (Angold et al., 1995) and psychologic tests (Schoenberg et al., 2008), and an electrophysiologic examination (electroencephalography), until an integral diagnosis was reached. This investigation was approved by the Ethics and Research Committee of the National Institute of Rehabilitation in Mexico City, and informed consent was signed by the parents of participating children.

2.2. DSM-IV-TR

To evaluate behavioural alterations in both school and home environments, we sent questionnaires to parents and teachers recommended by the American Psychiatric Association criteria for identifying AD-HD (American Psychiatric Association, 2002) after du Paul (1991). The questions can be responded to in the following four ways: "never"; "sometimes"; "often" or "very often". The first nine questionnaire items are concerned with inattention, the following nine with hyperactivity and the last items with impulsivity. A child is considered to have fulfilled criteria for AD-HD when parents and teachers answer "often" or "very often" in at least six items in each part of the questionnaire. AD-HD was classified according to the three recognised DSM-IV-TR subtypes as follows: combined (-C); mainly with inattention symptoms (-I) and (-H), mainly with hyperactivity-impulsivity.

2.3. EDAH

We administered the EDAH scale in teachers and parents of the population of studied children in our sample with no modification or adaptation from the original EDAH version. The objective of the EDAH test is to obtain a score for the customary behaviour of the child. The questionnaire affords a structured observation for teachers in 20 items that are divided into the following two 10-items subscales: (1) Subscale for AD-HD and (2) Subscale for CD (Farre Riba and Narbona García, 2001). The AD-HD subscale is composed of five items for the hyperactivity-impulsivity domain, and five items for the AD domain. When a certain child complies with the criteria of both domains, he/she can be categorised as suspicious for having mixed AD-HD. Questions can be answered in four ways with numerical equivalence: "never" (0); "sometimes" (1); "often" (2) and "very often" (3). The cut-off point for fulfilling the AD-HD criteria for hyperactivity-impulsivity or AD-HD with attention deficit is 10, while the cut-off point for fulfilling CD criteria is 11. In the case of the addition of the two conditions (AD-HD-H plus AD-HD-I), the cut-off point is 18.

2.4. Statistics

We calculated 80% statistical power to detect AD-HD in a population with a 5% prevalence of AD-HD. The number of children to be studied was equal to 103 (Brower et al., 1997); thus, our sample size somewhat exceeds this amount. We measured the mean (\bar{x}) and the standard deviation (SD) of continuous variables and percentages in binomial variables. We used one-way analysis of variance (ANOVA) to compare the means of three or more groups, with the Tukey *post-hoc* test to locate differences among groups. Differences in binomial variables were compared by the χ^2 test. Afterwards, we calculated the correlation values among psychometric data values by means of the Spearman method. We additionally calculated Cronbach's alpha measurements. Sensitivity and specificity were measured by means of 2×2 contingency tables. The *a priori* alpha value accepted was $p \leq 0.05$ (Dawson-Saunders and Trapp, 1997). We used Statistical Package for Social Sciences (SPSS) software version 14.0.

3. Results

According to DSM-IV-TR teachers' and parents' questionnaire results, the children suggested as having AD-HD could be classified into three recognised subgroups as follows: AD-HD-C, $n = 32$; ADD-I, $n = 17$ and ADD-H, $n = 32$. We studied 51 children from the same school without evidence of AD-HD as a control group. The average age \pm S.D. of 132 children of the sample was 9.2 ± 2.0 years. Children with AD-HD had an average age of \pm S.D. 9.0 ± 1.7 years, while children without AD-HD had an average age of 9.4 ± 2.3 years. The subgroup of children with AD-HD-C had an average age of 8.5 ± 1.8 years, while the subgroup of children with AD-HD-H had an average age of 8.9 ± 1.4 years. The subgroup of children with AD-HD-I had an average age of 9.7 ± 1.7 years.

The results of DSM-IV-TR teachers' and parents' questionnaires is depicted in Table 1. The frequency of children fulfilling DSM-IV-TR criteria for AD-HD according to teachers' response of the questionnaire was 65%, and in case of parents, 61%. Correlation among both

Table 1

Frequency and percentage of Attention deficit-hyperactivity disorder (AD-HD) and hyperactivity/impulsivity in parents' and teachers' Diagnostic and Statistical Manual of Mental Disorders-IV edition-Text revision (DSM-IV-TR) questionnaires.

Classification	Parents		Teachers		Concordance	
	N	%	N	%	N	%
AD-HD	81	61	86	65.1	77	94.1

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