THE CLINICAL EFFICIENCY OF ASEBA SCALES IN THE DIFFERENTIAL DIAGOSTIC OF ADHD

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Abstract: *The clinical diagnosis of ADHD is a difficult task because the clinical manifestation of this disorder seems to be very heterogeneous. Errors in diagnosis and nosological classification are one of the alleged causes of the fact that in recent years we witness an increase in the prevalence of ADHD. The Achembach scales have proved to be particularly effective in discriminating patients who suffer from ADHD from those who have a diagnostic of Autistic disorders. The purpose of this study is to analyze the ability of Achembach scales to discriminate between 6-18 years N = 30 children diagnosed with Attention Deficit Hyperactivity, N = 40 diagnosed with Autistic Disorder and N = 40 normal children, with negative psychiatric diagnosis. Analyses of sensitivity and specificity varies between (85.3 and 99.1 percent), which means that most scores identify correctly the subjects of the ADHD group, regardless of which group was discriminated against. Data presented in this study supports the usefulness of CBCL scales in the differential diagnosis of ADHD and Autism.*

Cuvinte cheie: *diagnostic clinic diferenţiar, scale Achembach, analiză discriminatorie*

Rezumat: *Diagnosticul ADHD este o sarcină dificilă deoarece din punct de vedere al tabloului clinic grupul celor suferinzi de această tulburare fiind unul eterogen. Erorile de diagnostic şi încadrare nosologică reprezintă una din presupusele cauze ale faptului că în ultimii ani asistăm la o creştere a prevalenţei ADHD. Scalele Achembach s-au dovedit a fi deosebit de eficiente în discriminarea pacienţilor ADHD de cei care suferă de Tulburări de Autism. Scopul acestui studiu este de a verifica capacitatea scalelor CBSCL 6-18 ani de a discrimina N = 30 copii diagnosticaţi cu Deficit de Atenţie şi Hiperactivitate, N=40 diagnosticaţi cu Tulburare de Autism şi N=40 copii normali, cu diagnostic psihiatric negativ. Analizele indicatorilor de sensibilitate şi specificitate variază între (85.3 şi 99.1 procente), ceea ce înseamnă că scorurile permit identificarea mojorităţii subiecţilor aparţinând grupului ADHD, indiferent de grupul faţă de care s-a discriminat. Datele prezentate în acest studiu susţin utilitatea scalelor CBCL în diagnosticul diferenţiar al ADHD şi Autism..*

INTRODUCTION

The clinical diagnosis of ADHD is a difficult task because the clinical manifestations of this disorder seem to be very heterogeneous. Errors in diagnosis and nosological classification are one of the alleged causes of the fact that in recent years we witness an increase in the prevalence of ADHD (Chakrabarti & Fombonne, 2005). One of the most common errors is the inclusion of children with autistic disorder diagnosis in the category of moderate ADHD (Fombonne 2003). For example, children with ADHD usually suffer a deficit at the level of the pragmatic language, communication and social interaction skills, empathy and emotional recognition of signs characteristic of autistic disorder (Bishop& Baird, 2001). Overlapping of clinical features characterizing the two disorders is a clinical problem which makes difficult the differential diagnosis. This fact explains why psychological assessment tools that allow discrimination of the two disorders have such a great value.

Among the many psychological assessment tools, scales Achembach proved to be particularly effective in discrimination of patients who suffer from ADHD Autistic disorders. This efficiency is supported by several empirical studies. Sikora, Hall, Hartley, Gerrard-Morris, and Cagli (2008) compared the efficiency of Child Behavior Checklist scales (CBCL) (Achenbach & Rescorla, 2000) and Gilliam Autism Rating Scale (GARS) (Gilliam, 1995) in discriminating between ADHD and Autism group. The results indicate a higher sensitivity to CBCL scales compared to GARS, the best discrimination of patients from the two categories can be made using the CBCL Withdrawal and Pervasive Development Disorders scales.

Bolte, Dickhut, and Poustka (1999) using the CBCL scales show that autistic children consistently achieve higher scores on scales of Social Problems, Thought Problems and Attention.

Duarte, Bordin, de Oliveira and Bird (2003) have examined the ability of CBCL scales to discriminate between children with autism and other psychiatric diagnosis normal control group. They found higher scores on the Thought Problems scales and syndromes Bizarre / Autistic category for the patients diagnosed with autism.

THE PURPOSE OF THE STUDY

The aim of the current study is to assess the value of discriminative efficiency of the eight CBCL scales, regarding three categories of subjects: Disorder Autism, ADHD and

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normal. More specifically our purpose is to identify the CBCL scales that allow discrimination of 6-18 years subjects diagnosed with Attention Deficit Hyperactivity (N = 30), from those diagnosed with Autistic Disorder (N = 40) and clinically normal subjects, without any psychiatric diagnosis (N = 40).

MATERIAL AND METHOD

Subjects (N = 110) included in our study were children aged between 6-18 years (m = 10.04 and s = 2.13) the sample is divided into three categories: Data on children included in the clinical groups were obtained from the psychiatrists of the children with Autistic Disorder, Attention Deficit Hyperactivity diagnosis. The diagnosis was made by psychiatrists on the basis of diagnosis (ICD code 299.00 - for Autistic Disorder and ICD code 314.01 and 314.20 - for ADHD). Normal subjects who participated in our study were selected from the pool of children included in Romanian Normative Study of Achembach Scales, subjects who have negative psychiatric diagnosis.

Data used in the study were obtained with the CBCL assessment scales (Achenbach, 1991) version filled by parent or caregiver of the selected child. This form includes 118 items describing behavior, emotional reactions and problems of social integration of children present in the last six months. Items are evaluated on a 3-point scale (0 - Not really one - is sometimes true and 2 - very often true). To collect data we used a translated and adapted version of the original instrument (Ivanova, M. et al., 2007).

Clinical group data were obtained from databases of psychiatrists from mental health institutions: County Psychiatric Hospital from Sighetul Marmatiei and Infant Psychiatry from Baia Mare. Children without mental data were collected from the Romanian Normative Study of Achembach Scales (Ivanova, M. et al., 2007).

Participation in the study was preceded by completion of written participation consent from parents. After obtaining consent to participate, parents were given a copy of CBCL scales with the request to complete and return this questionnaire to psychiatric office where the child was selected and diagnosed.

Statistical analysis of data was performed by using SPSS 16 (Statistical Packeges for Social Sciences) statistical software. In the analysis of raw data were entered scores obtained after applying CBCL scales. The purpose of statistical analysis was to identify the best predictors that allow prediction of membership in a diagnostic category of all the subjects included in the study. To achieve this we have used multiple logistic regression analysis in which we included as a criterion a dummy coded variable ADHD vs. Autistic syndrome, and ADHD vs Normal. As predictors we used the syndrome interpretation of CBCL scales scores. To judge the statistical significance of each predictor variable we set the alpha threshold to 0.05.

RESULTS AND DISCUSSIONS

In the regression analysis we used the eight sindrome scales of the CBCL questionaire, comparing their capacity to discriminate between ADHD and autism, respectivelly the ADHD and normal groups in each regression analysis. In both regression analysis statistically significant results were obtained, with the variance explained by the predictors in the criteria variance, fluctuating between 40% (ADHD and autism) and 45% (ADHD and normal).

Table 1 shows the means and standard deviations of the raw scores from CBCL for the diagnostic criteria involved in the study: ADHD, autism and normal.

Given the three groups differ with regards to age, and the distribution of the gender variable, these demographic variables have been included in the multivariate and covariate comparisons.

After the control of the mentioned variables, the multivariate covariance analysis indicated significant differences for all CBCL scales: Anxiety/depression, $F(3, 105) = 43.75$, $p=0.001$; Withdrawel/depression, $F(3, 105) = 37.75$, $p=0.001$; Somatic problems, $F(3, 105) = 24.15$, $p=0.001$; Social problems, $F(3, 105) = 54.15$, $p=0.001$; Thought Problems, $F(3, 105) = 55.23$, $p=0.001$; Attention problems, $F(3, 105) = 112.75$, $p=0.001$; rule breaking behaviour, $F(3, 105) = 49.14$, $p=0.001$; aggressive problems $F(3, 105) = 73.51$, $p=0.001$.

Tabel no. 1. Means and standard deviations for CBCL scores for the three groups of subjects (ADHD, Autism and Normal)

CBCL Scale	ADHD (N=30)	Autism (N=40)	Normal (N=40)
Anxiety/ depression	5.06 (3.23)	5.40 (4.38)	3.27 (3.41)
Withdrawl/ depression	2.27 (2.31)	4.56 (3.13)	1.58 (1.89)
Somatic problems	2.26 (2.54)	1.86 (2.14)	1.73 (2.38)
Social problems	6.12 (3.45)	6.90 (3.15)	3.34 (3.41)
Thought Problems	4.77 (3.14)	5.88 (4.45)	1.78 (2.13)
Attention problems	7.12 (2.45)	8.76 (2.67)	3.50 (2.66)
Rule breaking behaviour	4.15 (3.31)	2.23 (2.14)	1.68 (1.45)
Aggressive problems	12.56 (7.41)	8.17 (5.76)	5.54 (4.34)

As the data in table 2 show, scores from the withdrawl / dpression and Thought Problems scales, sistematically display significant predictors for the diagnostic category in both regression analisys.

Odds Ratio for each predictor oscilates between 1.27 and 1.47. Withdrawl/ Depression diffentiates the ADHD better from the autism group, compared to Thought Problems. When the ADHD group was compared to the normal group, besides the two already mentioned variables, a third one appears to be significant, attention problems.

The analysis of sensibility and specificity indicators variate between (85.3 şi 99.1 percent). This means that high scores in the significant scales allow the identification of almost all subjects who belong to the ADHD group, no matter the group that was used to discriminate. With regards to specificity, it can be said it has higher variablity, but in essence the variance is between 62.8 and 92.5 percent. This means that low scores in the significant scales allow for the correct identification of ADHD subjects compared to autism.

As can be seen in table 2 Thought Problems have a sensibility of 93.6% and a specificity of 85.7%. This means that scores in the scale Thought Problems identify almost all children in the ADHD group and low scores in the scale allow the identification of the majority of children from the normal category.

CONCLUSIONS

The data presented in this study give solid empirical support to the use of CBCL scales in the differential diagnose of ADHD and Autism. The results show that the scales withdrawel/depression and thought problems significantly discriminate the ADHD children from the autism children.

Table no. 2. Regression analisys by which belonging to one of the diagnostic groups was predicted (ADHD, Autism and Normal), using the CBCL scale as predictor (in the table only significant predictors are shown, while with * those which are significant for 0.05 are shown and with ** those significant for 0.01are shown)

Predictor	Regression coefficient	Odds Ratio	Wald	Confidence interval 95% forOR (Li, Ls)	Sensibility	Specificity
ADHD vs. Autism						
Withdrawl/depression	0.42**	1.44	34.92	(1.34, 1.79)	86.1%	68.2%
Thought Problems	0.25**	1.43	21.38	(1.19, 1.51)	94.4%	92.5%
ADHD vs. Normal						
Withdrawl/depression	0.26*	1.25	8.42	(1.09, 1.54)	85.3%	62.8%
Attention problems	0.32*	1.45	22.13	(1.19, 1.56)	99.1%	85.7%
Thought Problems	0.36*	1.47	23.79	(1.25, 1.67)	93.6%	68.6%

A high score in these scales correctly identifies the majority of ADHD children, no matter the contrast group. Furthermore, low scores in these scales allow for the correct identification of the majority of subjects in the autism category.

As can be seen in table 2, attention problems are significant too, but only in the discrimination of ADHD from the group of normal children, with negative pshychiatric diagnose.

The data presented in this study are similar to those from other empirical studies which have investigated the role of CBCL in the differential diagnose of ADHD (Sikora, Hall, Hartley, Gerrard-Morris şi Cagle, 2008), which confirms that these results are generally applicable, no matter the culture.

Furthermore these results support the efficiency of CBCL scales, given the low time and financial ressources they require. (Howlin & Asgharian, 1999). When a tool for evaluation has a low rate of false positives, both children and families are exposed less to detailed analysis which leads to emotional drainage and high costs. In the case of a low rate of false negatives, children with a higher risk of ADHD can be identified with a higher probability, thus lowering the chance that a child will not benefit from the services which are appropriate for his state.

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