Correspondence between DSM IV ADHD and ICD 10 Hyperkinetic Disorder in Croatian Sample

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CORRESPONDENCE BETWEEN DSM IV ADHD AND ICD 10 HYPERKINETIC DISORDER IN CROATIAN SAMPLE

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SUMMARY – The aim of the study was to examine directly the extent to which ICD 10 hyperkinetic disorder and DSM IV attention deficit/hyperactivity disorder (ADHD) identify the same children with the same difficulties. Participants were elementary school children (n=409) aged 7-10 years. Diagnostic criteria for ICD 10 hyperkinetic disorder and DSM IV ADHD were applied. Four groups were identified: hyperkinetic disorder and ADHD (n=35), ADHD only (n=27), hyperkinetic disorder only (n=3), and children without any symptoms according to DSM IV and ICD 10 criteria (n=344). The kappa coefficient assessing the agreement between the DSM IV ADHD and ICD 10 hyperkinetic disorder was K=0.66; percent of agreement = 78%. The χ^2-test yielded $\chi^2=250.3$ (df=1; $p<0.001$). The prevalence of DSM IV ADHD and ICD 10 hyperkinetic disorder was 15.16% and 9.3%, respectively. DSM IV was found to identify a broader group of children, however, there was a substantial overlap between the groups formed according to these criteria.

Key words: *Attention deficit disorder with hyperactivity, diagnosis; Hyperactivity, diagnosis; Child behavior disorders, classification; Reference values; Child; Croatia*

Introduction

Hyperactive behavior was first described in 1932, after a pandemic of encephalitis lethargy followed by an increased number of children presenting hyperactive and impulsive behavior[1]. Most researchers believed that this behavioral pattern was caused by minimal cerebral dysfunction/damage (MCD). The research and diagnostic methods of the time failed to produce evidence for minimal cerebral damage[2]. Therefore, the classification systems of behavior problems were more or less confined to description of phenomenology[2-4].

International Classification of Diseases (ICD) is an official classification of the World Health Organization (WHO). In 1969, ICD 8 classified the disorder as a hyperkinetic reaction of childhood[5]. ICD 9 classified the disorder as a hyperkinetic syndrome[6], and ICD 10 as a hyperkinetic disorder[7,8]. According to DSM classification (official classification of the American Psychiatric Association) from 1994, the disorder is classified as attention deficit/hyperactivity disorder (ADHD)[9]. The names used in prior versions of DSM emphasize different conceptualization of the disorder over years, from motor dysinhibition in DSM II (hyperkinetic reaction of childhood), inattention in DSM III (ADD, attention deficit disorder) through both inattention and hyperactivity in DSM III R and DSM IV[10]. Also, while DSM III R considers ADHD to be a unitary disorder such as hyperkinetic disorder in ICD 10, DSM IV conceptualized ADHD as having three subtypes: combined, predominantly inattentive, and predominantly hyperactive-impulsive subtypes[11]. For both clinicians and researchers, this evolution in diagnostic thinking has been helpful because of the improvements in reliability and validity of successive definitions, but confusing for uncertainty in generalizing one diagnostic system to another. It remains an empirical question whether these two systems of classification are in fact identifying the same, or similar, groups of children.

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Subjects and Methods

Subjects

The Šime Budinić elementary school from Zadar was randomly selected among all elementary schools in the Republic of Croatia. The study included all children (N=409) of the 1st to 4th grade of this elementary school, aged 7 to 10 (mean±SD 8.6±1.4) years, of both sexes (194 boys and 215 girls).

Medical examination

The first step was to distribute the Conners psychiatric rating scale for analysis of hyperkinetic/attention disorder to teachers and parents (forms for parents with 48 items and forms for teachers with 38 items)[12]. We used the Conners rating scale as a screening test for attention/hyperactivity child problem. Based on the Conners rating scale, 131 children suspected for ADHD were singled out and observed by a medical doctor, who made a diagnosis of ADHD according to DSM IV criteria or of hyperkinetic disorder according to ICD 10 criteria. Children were identified as DSM IV ADHD if the following criteria were met:

1. Teachers' report indicated that the child exhibited 6 or more symptoms of inattention and/or 6 or more symptoms of hyperactivity/impulsivity.
2. Parents' answers to the standardized questionnaire or clinical interview with the child indicated the symptoms of inattention/hyperactivity/impulsivity to be were present in more than one setting.
3. The symptoms interfered with the child's functioning.

Children were identified as hyperkinetic disorder according ICD 10 criteria if all of the following criteria were met:

1. Parents' answers to the questionnaire pointed to a minimum of 6 symptoms of inattention and 3 symptoms of hyperactivity.
2. The symptoms of hyperactivity, impulsivity and attention deficit were present at the time of observation.

Statistical analysis

Concordance between ICD 10 and DSM IV for the presence/absence of the diagnosis of hyperkinetic disorder/ADHD was tested by both percentage agreement and Cohen's kappa (K). If K was greater than 0.60 and percentage agreement higher than 73%, diagnostic reliability was considered appropriate. Mc Nemar c^2 – test for dependent samples was used for analysis of correlation between DSM IV and ICD 10 diagnosis. Statistical significance was set at 1% ($p<0.01$). The prevalence of DSM IV ADHD and ICD 10 hyperkinetic disorder was also calculated.

Results

Out of 409 children, 62 (15.6%) met DSM IV criteria for ADHD, 35 children met the criteria for the hyperactive-impulsive/combined subtype, and 27 for the inattentive subtype. All children who met the criteria for the hyperactive-impulsive/combined subtype ADHD according to DSM IV, met the criteria for hyperkinetic disorder according to ICD 10. None of these 27 children who met the criteria for inattentive subtype ADHD met the criteria for ICD 10 hyperkinetic disorder.

ICD 10 classification was applied in the same sample of 409 children, which showed 38 (9.3%) children (9.3%) to meet the criteria for ICD 10 hyperkinetic disorder only. Only three children who met the criteria for ICD 10 hyperkinetic disorder did not meet the criteria for ADHD according to DSM IV.

The χ^2-test with Mc Nemar correction yielded a statistically significant difference ($\chi^2=250.3$; $df=1$; $p<0.001$). Cohen's kappa coefficient of agreement was moderate (percentage of agreement 78%; K=0.66). The prevalence rate calculated from DSM IV was 15.16% for ADHD, and from ICD 10 9.3% for hyperkinetic disorder.

Discussion

The results of this study suggested significant overlapping of cases identified by the ICD 10 and DSM IV diagnostic systems. The majority of children with diagnosed hyperkinetic disorder also met the criteria for ADHD. However, the results also suggested the DSM IV criteria for ADHD to identify a broader group of children than the ICD 10 definition of hyperkinetic disorder. The children who met the criteria for both hyperkinetic disorder and ADHD represented an ADHD combined type or hyperactive impulsive type according to DSM IV. The small number of children with the diagnosis of hyperkinetic disorder alone prevented comparison of this group with either hyperkinetic, ADHD group or ADHD only group. These children presumably had considerable problems with inattention and overactivity but did not display the required six symptoms of inattention or hyperactivity/impulsivity.

However, literature reports from different countries show different prevalence rates of hyperkinetic disorder or ADHD, varying from 3% to 20%[13,14]. This suggests that differences in the prevalence rates were not due to cross-national differences in the rate of behavioral phenomena but rather to differences in diagnostic practice or conceptualization of these behavioral patterns[15-17].

The DSM IV system, which has been developed in North America, is becoming increasingly popular as a di-

agnostic system in other countries as well. It also appears to be preferred by scientific journals for the presentation of research results. The ICD system continues to be used in clinical practice in Europe, and is used worldwide for morbidity statistics recording. Until recently, the WHO and American Psychiatric Association (APA) descriptions of childhood hyperactivity have differed in three key respects: the symptoms they emphasize, the importance they place on symptom pervasiveness, and their treatment of comorbid conditions[9]. The DSM IV appears to bring the WHO and APA systems for classifying childhood hyperactivity closer than they have been for almost three decades. The increased similarity between ICD 10 hyperkinetic disorder and ADHD is not accidental. There was a close liaison between the working parties of the WHO and the APA[18,19]. However, the definition of hyperkinetic disorder and the criteria for ADHD are not identical[20].

The ICD 10 definition of hyperkinetic disorder emphasizes the presence of abnormal levels of inattention and overactivity in home and school settings, together with the direct observation of this inattention/overactivity[7,9]. Whereas DSM IV requires that symptoms must be present in *2* or more settings, it does not require direct observation of the symptoms by the clinician[21-26].

In conclusion, the study sample was not a representative epidemiologic sample. However, it could be considered representative of children referred for evaluation of ADHD, and offered useful insights into the similarities and differences between the children meeting the diagnostic criteria for ADHD and those meeting the criteria for both ADHD and hyperkinetic disorder in this context.

The imperfect overlap between the two diagnostic systems has several implications:

1. In countries in which the ICD 10 system is used in the diagnosis of mental disorders, children with significant problems of hyperactivity or inattention but not both may go undiagnosed.
2. The children diagnosed as hyperkinetic are likely to correspond to the ADHD combined type only but not to the inattentive or hyperactive-impulsive type. Conversely, the results from studies including these three ADHD subtypes will not necessarily apply to children with hyperkinetic disorder.
3. Finally, as the ICD system is used worldwide for recording morbidity statistics, the recording of prevalence rates for hyperkinetic disorder is likely to be inflated in the countries using DSM IV for clinical diagnosis.

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Sažetak

PODUDARNOST IZMEĐU POREMEĆAJA SMANJENE POZORNOSTI/HIPERAKTIVNOSTI (DSM IV ADHD) I HIPERKINETSKOG POREMEĆAJA ICD 10 U UZORKU HRVATSKE DJEČJE POPULACIJE

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Cilj ovoga rada bio je usporediti u kojoj mjeri kriteriji MKB 10 za hiperkinetski poremećaj i poremećaj pozornosti/hiperaktivnosti (ADHD) prema kriterijima DSM IV prepoznaju istu djecu s istovrsnim smetnjama. Ispitanici su bila djeca osnovnoškolskog uzrasta starosti 7-10 godina (n=409). U analizi su primijenjeni dijagnostički kriteriji prema klasifikaciji MKB 10 za hiperkinetski poremećaj i kriteriji DSM IV za ADHD. Izdvojene su četiri skupine djece: hiperkinetski poremećajem i ADHD (n=35), samo ADHD (n=27), samo hiperkinetski poremećaj (n=3) i djeca bez simptoma prema kriterijima DSM IV i ICD 10 (n=344). Koeficijent podudarnosti između hiperkinetskog poremećaja MKB 10 i DSM IV ADHD bio je K=0.66; postotak podudarnosti 78%. χ^2-test pokazao je statistički značajan rezultat (χ^2=250.3; df=1; $p<0.001$). Prevalencija za ADHD prema DSM IV bila je 15.16%, a za MKB 10 hiperkinetski poremećaj 9.3%. Utvrđeno je da DSM IV identificira širu skupinu djece, međutim, nađeno je značajno preklapanje među prepoznatim skupinama djece uz ova dva različita kriterija.

Ključne riječi: *Poremećaj smanjene pozornosti s hiperaktivnošću, dijagnostika; Hiperaktivnost, dijagnostika; Poremećaji ponašanja u djece, klasifikacija; Referentne vrijednosti; Dijete; Hrvatska*