Early identification of Asperger syndrome in young children

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ABSTRACT

This study was designed to identify items of the ADI-R that allow an early and sensitive identification of children with possible Asperger syndrome (AS). The aim was to obtain an economic short interview suitable for screening purposes. The study was based on data from a clinical sample of 5–18-year-old children and adolescents (mean age 10.9 years) with either Attention-Deficit Hyperactivity Disorder (ADHD; $n = 43$) or AS ($n = 62$). The introductory questions and 36 items, which contribute to the diagnostic algorithm of the ADI-R, were subjected to content analysis and stepwise discriminant function analysis. Eight meaningful items were found, which were shown to be good predictors of AS and to discriminate between the children with AS and those with ADHD. The short interview was especially useful for the assessment and screening of children up to 11 years in our sample, because in this subgroup, sensitivity was even higher (.92) and specificity was also excellent (.90). Eight items with high discriminatory power allowed sensitive and economic screening for young children with suspected AS.

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1. Introduction

Asperger syndrome (AS) belongs to the group of autism spectrum disorders (ASDs; Beglinger & Smith, 2001; Frazier et al., 2012; Kamp-Becker et al., 2010; Mandy, Charman, & Skuse, 2012). These are characterized by severe impairments in social communication and interaction as well as repetitive and stereotyped interests. Diagnosis of AS also requires lack of any clinically significant delay in language acquisition or cognitive development (WHO, 1992). In DSM-V, an explicit diagnostic category "Asperger syndrome" will no longer exist. But this does not mean that individuals with milder autistic symptoms, good cognitive and language abilities disappear. Also in future clinicians will have to decide if certain symptoms resemble a milder disorder in the autistic spectrum or can be better explained by other diagnoses, as for example Attention-Deficit Hyperactivity Disorder (ADHD).

Despite an increasing knowledge and awareness of ASD and valid diagnostic instruments, the average age of identification of affected children with AS is high. A British study (Howlin & Asgharian, 1999) showed that children with childhood autism were an average of 5.5 years old when a diagnosis was given, whereas the average age of children with AS lay at 11 years. Parents of both groups of children were aware of problems at an early age: parents of children diagnosed with childhood autism noticed early symptoms by 18 months of age, while parents of children diagnosed with AS had first concerns when the child was around 30 months of age. Children with AS diagnoses more frequently showed a history of other diagnoses, such as ADHD, conduct disorder or emotional disorders. In a more recent study, the median age at which a diagnosis of ASD was given was found to be 5.7 years (Shattuck et al., 2009). Male sex, an IQ of 70 or lower and regression in development led to earlier diagnoses.

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An early diagnosis is also important for children with milder variants of ASD, as earlier interventions are more successful (Charman & Baird, 2002; Howlin, 1998; Petermann & Koglin, 2008; Turner, Stone, Pozdol, & Coonrod, 2006). Dawson (2008) provides a model of brain plasticity in ASD and summarizes promising studies regarding early behavioral interventions for infants and toddlers with ASD and their parents. Positive effects have been shown on IQ, language and educational placement (Birnbrauer & Leach, 1993; Cohen, Amerine-Dickens, & Smith, 2006).

Several screening questionnaires were developed to identify children at risk of ASD (for an overview, see Campbell, 2005; Norris & Lecavalier, 2010), including the Checklist for Autism in Toddlers (CHAT/M-CHAT; Baron-Cohen et al., 2000; Dumont-Mathieu & Fein, 2005), the Autism Spectrum Screening Questionnaire (ASSQ; Ehlers, Gillberg, & Wing, 1999), the Gilliam Autism Rating Scale (GARS; Gilliam, 1995; GARS-2, Gilliam, 2006) or the Social Communication Questionnaire (SCQ; Rutter, Bailey, & Lord, 2003). Other instruments focus on AS, e.g. the Asperger Syndrome Diagnostic Scale (ASDS; Myles, Bock, & Simpson, 2001), the Childhood Asperger Syndrome Test (CAST; Scott, Baron-Cohen, Bolton, & Brayne, 2002), the Gilliam Asperger's Disorder Scale (GADS; Gilliam, 2001) and the Krug Asperger's Disorder Index (KADI; Krug, Arick, & Almond, 2003). According to Norris and Lecavalier (2010), the SCQ has been most frequently evaluated and is most supported by current research. The other instruments predominantly show limitations regarding the diagnostic reliability and validity or are not sufficiently examined (Norris & Lecavalier, 2010; Campbell, 2005). The authors of the ASDS, for example, do not provide information for test–retest reliability and the standardization sample included 80% of children diagnosed with autism *and* mental retardation. Reliability and validity data of the ASSQ are sufficient, but the sensitivity of the parent (.62–.82) and teacher forms (.65–.70) is too low for precise screening. This is also true for the sensitivity (.78) of the KADI. Reliability data for the CAST are not available. For a critique see also Campbell (2005).

Screening instruments aim to identify children with ASD versus individuals with disorders that resemble ASD (e.g. language disorders, developmental delay, ADHD, emotional disorders, etc.). Unfortunately, many screening instruments were evaluated using comparison groups that consisted of individuals with typical development, which is not a satisfactory test of validity. A useful screening instrument must be able to discriminate between ASD and disorders which could possibly be mistaken for autism, e.g. emotional disorders, language disorders or ADHD. The SCQ has been subjected to the widest range of comparison groups, while other scales have been examined among less diverse samples (Norris & Lecavalier, 2010, p. 279). However, the SCQ has also not been validated for AS.

Screening instruments can take the form of standardized observations, interviews, or rating scales. The latter are the most frequently used, holding the advantages of simplicity and efficiency of administration and scoring, low cost and less time expenditure. A further advantage is that they allow the rater to consider a wide range of behavior over a broad time period and across a number of different settings (Norris & Lecavalier, 2010). Nevertheless, this also implies limitations as the rater makes subjective judgments/inferences about the behavior. To date, the Autism Diagnostic Observation Scale (ADOS-G; Lord et al., 2000; German version: Rühl, Bölte, Feineis-Matthews, & Poustka, 2004), a semi-structured, standardized instrument, in combination with the Autism Diagnostic Interview (ADI-R; Rutter, Le Couteur, & Lord, 2003; German version: Bölte, Rühl, Schmötzer, & Poustka, 2006) are frequently used in the assessment of autistic disorders. Furthermore, clinical judgment, the assessment of intelligence level and neuropsychological measures should complete the diagnostic process. However, this procedure is very time-consuming and thus cost-intensive. ADOS-G and ADI-R were originally developed to assess individuals with suspected childhood autism. Norms for AS and other milder variants do not exist.

Currently, there is lively debate regarding the diagnostic differences, similarities and overlaps of childhood autism, AS and ADHD (Holtmann, Bölte, & Poustka, 2007; Goldstein & Schwebach, 2004; Sinzig & Lehmkuhl, 2007). Jensen, Larrieu, and Mack (1997) showed that 74% of the children with ASD in their sample had received an earlier ADHD diagnosis. Perry (1998) confirmed this finding in particular for children with milder ASD. ADHD is the most frequently found comorbidity in ASD, with prevalence rates of 26–31% (Leyfer et al., 2006; Simonoff et al., 2008). However, the possible co-occurrence of ASD and ADHD is not the only factor complicating the diagnostic process; a further diagnostic difficulty is that ADHD constitutes the most important differential diagnosis of ASD.

Although, according to ICD-10 and DSM-IV-TR, ADHD cannot be diagnosed in AS, there is growing evidence of a comorbidity of ASD and ADHD. Gargaro, Rinehart, Bradshaw, Tonge, and Sheppard (2011) state that "there is an emerging consensus, [..], that some of the more consistently found *additional* behaviors observed in high-functioning individuals with autism are in fact core features of neuropsychiatric disorders such as ADHD". Nevertheless, for clinicians, it is extremely important to identify an autistic disorder per se and to recognize the fundamental disturbance. As mentioned above, for many children, it takes a long time until they obtain a correct diagnosis (Howlin & Asgharian, 1999) and adequate and appropriate therapy.

Therefore, the aim of the present study was to develop a short screening interview which allows early and sensitive recognition of autistic symptoms in high-functioning individuals as well as the discrimination between AS and ADHD. The interview should be used in particular by pediatricians or other clinicians who have to decide on the presence of autistic or ADHD symptoms and determine the next step in the diagnostic process. As time is always limited in everyday clinical practice, the interview should be both economic and accurate. Only in cases of a score above the cut-off should the full clinical diagnostic procedure be recommended, e.g. in an outpatient clinic specialized in ASD.

Compared to paper-and-pencil rating scales, an interview shows higher diagnostic objectivity and allows detailed questions on the concrete behavior of the child in different situations. This is why we chose the ADI-R in the framework of the current study and not one of the Asperger Questionnaires. The ADI-R is an acknowledged and established instrument in the autism diagnostic procedure (De Bildt et al., 2004; Hill et al., 2001; Lord, Rutter, & LeCouteur, 1994;