Regional Centre for Child and Adolescent Mental Health

Eastern and Southern Norway

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AUTISM SPECTRUM TRAITS IN CHILDREN AND ADOLESCENTS WITH OBSESSIVE-COMPULSIVE DISORDER (OCD)

Tord Ivarsson[ab] and Karin Melin[b]

[a]Centre for Child and Adolescent Mental Health, Eastern and Southern Norway, Gullhaug Torg 4B, 0484 Oslo; Postal address: Postboks 4623 Nydalen, 0405 Oslo, Norway

and Department of Child and Adolescent Psychiatry, Göteborg University, Kungsgatan 12, SE-411 19 Göteborg, Sweden

[b]Department of Child- and Adolescent Psychiatry, Queen Silvia Children's hospital, Göteborg, Sweden

Corresponding author:

Tord Ivarsson,

R-BUP, Postboks 4623 Nydalen, 0405 Oslo, Norway,

Telephone: +47 22 58 60 00

Fax + 47 22 58 60 01

Email: tord.ivarsson@r-bup.no

Abstract

Objective: Assess the prevalence of autistic traits (AST) in pediatric OCD and relate them to OCD co-morbidity and compare them with published normative data.

Methods: Pediatric patients with Obsessive-Compulsive Disorder (n=109) according to the DSM IV were studied using parent ratings of the Autistic Symptom/Syndrome Questionnaire to assess AST symptoms as a continuous rather than categorical trait. The KSADS, a semi-structured psychiatric interview, was used for the psychiatric diagnostic evaluation. Also, the Children's Yale-Brown Obsessive Compulsive Scale was used to assess OCD severity and other clinical features.

Results: AST was common among our patients. Symptom scores were highest in cases with co-morbid Autistic Spectrum Disorders, but cases with other co-morbidities as tics/Tourette and attention/behavioral disorders also scored higher. All sub-groups, including OCD without these co-morbidities scored higher than the Swedish normative group. Using ANOVA, co-morbid ASD and tics/Tourette (plus a term for gender by tic interaction indicating that girls with tics scored high, otherwise low) and pathological doubt contributed (R^2= .41) to the AST-traits, while OCD severity and co-morbid anxiety- and depressive disorders did not.

Conclusion: AST traits are prevalent in OCD and seem to be intricately associated with the co-morbidities as well as the OCD syndrome itself. The findings might have implication for our nosological understanding of OCD which currently is discussed.

1 Introduction

1.1 OCD nosology debate

OCD is a not uncommon disorder among children and adolescents (Heyman et al., 2001), has often a chronic course (Stewart et al., 2004) and is classified in the DSM as an anxiety disorder in view of the anxiety associated with obsessions and the function of rituals to ease this anxiety. However, there has been considerable debate about the nosological placement of OCD recently (Bartz & Hollander, 2006). This is the consequence of many aspects of OCD phenomenology. One reason is the remarkably heterogeneous features found in OCD patients (McKay et al., 2004). For one, the OCD phenomenology itself shows many diverse features (Calamari et al., 1999; Ivarsson & Valderhaug, 2006; Leckman et al., 1997). Following this lead, a term, OC spectrum disorders has been coined as an "umbrella concept" to express similarities that are found between OCD and various disorder, for example hypochondriasis, body dysmorphic disorder, trichotillomania, but also tic disorders and autism (see (Bartz & Hollander, 2006) for a recent review of this issue).

Other grounds for this debate are findings from the way other disorders are associated with OCD in family studies (Grados et al., 2001; Hanna et al., 2005; Pauls et al., 1995) and findings from studies of OCD co-morbidity patterns (Geller et al., 2000; Hanna et al., 2002; Ivarsson et al., 2007). Furthermore, findings from the study of endophenotypes, i.e. the association between different anxiety disorders and the neurocircuitry involved in the symptom formation have fuelled the debate as well as (Bartz & Hollander, 2006).

One reason for the question if OCD is properly placed among the anxiety disorders is the overlap phenomenologically between OCD and the autism spectrum disorders (ASD). Many OCD patients are characterized by repetitive behaviors just like ASD-patients are. In OCD, many patients have ordering and symmetry compulsions, as well as repetition compulsions harboring a wish for a "just right" feeling (Rasmussen & Eisen, 1990; Rapoport, 1989), even to the extent that this can be thought of as a particular OCD-factor, i.e., "Symmetry and Ordering" (Baer, 1994; Leckman et al., 1997) or a group of patients with such symptoms (Calamari et al., 1999; Ivarsson & Valderhaug, 2006). Likewise some patients with strong traits of hoarding (Baer, 1994; Leckman et al., 1997) seem to be attached to objects in a way that is akin to that seen in ASD.

ASD is frequently a co-morbid problem in OCD, both in pediatric (Ivarsson et al., 2007) and in adult populations (LaSalle et al., 2004), at levels that exceeds those that are found in the general population (Ehlers & Gillberg, 1993) (for a review see (Williams et al., 2006)). Also, family members of ASD probands show compulsive personality traits, something that further emphasizes the link between the disorders.

Furthermore, Bejeroth found a subgroup of adult OCD-patients with autistic traits shown among other things through low sociability (Bejerot et al., 2001).These findings are similar to findings by (Ivarsson & Winge-Westholm, 2004), who studying temperament in OCD, found that roughly half of the patients were characterized by low levels of activity, high levels of shyness and low levels of sociability. Do those individuals that are most extreme with regard to low sociability border on ASD pathology?

If OCD might be thought of as less related to the anxiety disorders and more fundamentally related to other OC-spectrum disorders including ASD (Bartz & Hollander, 2006), several implication ensue. One would be that pediatric OCD-patients ought to show more clear-cut

ASD traits, i.e. the ASD relationship should not only be expressed through the OCD-symptoms, but as core ASD symptoms present in the patients to a significant degree, both above and below the level for an ASD diagnosis. Thus, OCD-patients should have ASD symptoms that could be perceived by people who know them well, i.e. parents or partners. While autistic traits could be noted in adults with OCD as rated by the clinician (Bejerot et al., 2001), ratings by the parents in pediatric OCD ought to be more reliable, especially using valid and reliable methods developed for this purpose. However, a serious problem arises with regard to the interpretation of possible ASD-traits in OCD. When above the diagnostic threshold, should these ASD-traits be seen as a case of co-morbidity, i.e. the co-occurrence of two separate disorders or is there "really" just one disorder with expression of divergent symptoms, i.e. OCD and ASD in these cases? What about ASD traits below the threshold even for an ASD UNS diagnosis? Are those related to the OCD-disorder per se, or are they related to other co-morbidities than ASD, e.g. ADHD and tic/Tourette, that can show such traits too (Ehlers et al., 1999)? As we factor out other contributing factors, what, if anything, remains?

1.2 Aims

The aim of the present study was to study ASD symptoms in pediatric OCD-patients using a dimensional approach, as well as the categorical/diagnostic approach and to compare them with previously published data on ASD symptoms in different clinical groups to study the pattern of relationships with ASD, co-morbidities and OCD.

2. Methods

2.1 Subjects

The study group are patients (n=109) who were assessed and treated at the specialized OCD-unit. All cases had primary OCD and fulfilled criteria according to the DSM IV. Sixty-six of these were adolescents (girls/boys = 39/27) and forty-three children (girls/boys = 21/22) (n.s.). Another twenty-two subjects who were eligible for participation in the study (thirteen adolescents and eleven children) declined participation. Also, the assessments of one individual failed to include the ASSQ (see below) and two ASSQs had more than 2 items not filled in. Thus a total of twenty four individuals comprise the attrition in the study.
Most patients had intact families (68%). Moreover, patients were most often of Swedish ethnicity with 7% of our patients having one parent and 12% having both parents of non-Swedish ethnicity. However, the socio-economic status of our patients did not differ due to ethnicity, both (5.76 and 6.05) being relatively close to the mean SES we found in a recent population based study (evaluating an anxiety scale) (Ivarsson, 2006).

2.2 Procedures and methods

All patients seeking treatment for obsessive compulsive symptoms at the OCD clinic at the Queen Silvia Children's hospital were assessed using a comprehensive diagnostic work-up. Following a formal diagnosis of primary OCD, the patients were informed of the study and given an information folder. Parent- and self rating scales (see below) were distributed together with instructions for filling in the scales. At the following visit the scales were collected. At the same time, informed consent was obtained. The diagnostic assessment of the psychiatric disorders of the patients was based on interviews using the Kiddie Schedule for

Affective Disorders and Schizophrenia-Present state and Lifetime version (KSADS-PL) (Kaufman et al., 1997) by a board certified child- and adolescent psychiatrist (mostly the first author) at a separate visit. In cases where resident doctors under training performed the assessment, they were trained by the first author and the assessment was checked through a video recording. In the KSADS-PL the DSM-IV criteria for the disorders was used.

A check of the OCD diagnosis was obtained through the Children's Yale-Brown Obsessive-Compulsive Scale (CYBOCS) (Goodman et al., 1986), a parent-, and child interview that yields all information needed for a DSM diagnosis of OCD. The CYBOCS is a semi-structured interview containing checklists of obsessions and compulsions. Scales assessing the severity of obsessions and compulsions separately (range 0-20) are added to a CYBOCS total score (range 0-40). Furthermore, lack of insight, avoidance, indecisiveness, inertia, and pathological doubt can be gauged using scores ranging from 0 to 4. Finally, a global severity score is assigned based on all information gathered during the interview. This includes behaviors, such as high "avoidance" that tend to lower compulsion sub-scores and other OCD behaviors, such as "inertia" that contribute to OCD severity without necessarily elevating the obsessions or Compulsions sub-scores. The checklists and the severity ratings were based on interviews with each child and each parent/adult informant.

In cases where autistic traits or disorders were suspected (these were not included in the KSADS-PL version used), a neuro-psychiatric assessment was performed. This assessment was supplemented with information from a screening questionnaire covering both current and pre-school autistic symptoms (Autism Screening Questionnaire (ASQ) (Berument et al., 1999) that the parents of all patients fill in).

Patients with a primary diagnosis of mental retardation, psychotic disorders, primary anorexia nervosa and autism were excluded from participation. However, Asperger's syndrome was allowed when the assessments showed that the Asperger symptoms were separate from the

OCD. The sample included all cases that fulfilled criteria for OCD according to the DSM-IV regardless of severity as expressed through the CYBOCS scores.

A parental rating scale developed in Göteborg was used assessing Asperger symptoms and traits was used, the high-functioning Autism Spectrum Screening Questionnaire (ASSQ) (Ehlers et al., 1999). It is a 27-item checklist for completion by lay informants when assessing symptoms characteristic of Asperger's syndrome and other high-functioning autism spectrum disorders in children and adolescents with normal intelligence or mild mental retardation. A few items could easily be confused with the OCD symptoms or tics (e.g., "Has difficulties in completing simple daily activities because of compulsory repetition of certain actions or thoughts, Has special routines; insists on no change, Has involuntary face or body movements") and in analyses within the sample these items were not included (ASSQ-R) in order to lower error. However, in comparisons with data from the ASSQ normative study (Ehlers et al., 1999), they were included.

Attrition: Not all ASSQ scales were filled in fully. If two or fewer items were missing, the series means was used to replace the missing data (n=8). Due to a clerical mistake, the last two items was missing from twenty-three questionnaires. However, if the remaining questions were filled in, the series means was used as above to replace the missing data, in the same way as above.

The diagnostic work up also included clinical interviews and the use of other rating instruments (the Children's Depression Inventory (CDI), and the Achenbach Child Behavior Check List (CBCL).

2.4 Statistics

We used t-test for the descriptive data with regard to continuous and chi-square for categorical variables. However, the ASSQ data were not well normally distributed, so

analyzing which variables were most important predictor for ASSQ scores using ANOVA analyses with stepwise elimination of the weakest predictors, we used the 10th logarithm of the ASSQ scores that approached a normal distribution.

3. Results

Many of our patients had ASD symptom according to the ASSQ (Figure 1). However, subtracting those symptoms in the ASSQ that could easily be confused with OCD-symptoms or that comprises symptoms of tics/Tourette's syndrome (that are present in a substantial minority of our cases) scores were somewhat lower (ASSQ-R).

Insert Figure 1 about here

Nine patients had been diagnosed as having an ASD, scoring significantly higher (M=12.9, SD=6.82) than those with other diagnoses (n=100) (M=4.0, SD=3.84), a significant difference (t(8.46)=3.88, p= .004) (equal variances could not be assumed). However, other co-morbid disorders than ASD were also associated with higher ASSQ scores : any tic syndrome (n=29) (M=6.7, SD=6.70) versus no tics (n=80) (M=4.0, SD=4.16), a significant difference (t(107)=2.71, p= .008); any ADHD syndrome (n=19) (M=7.0, SD=6.46) versus no ADHD (n=90) (M=4.2, SD=4.26), a significant difference (t(107)=2.39, p= .019). Patients with any ASD, ADHD or tic/Tourette's disorder (n=46) had high ASSQ scores (M=7.3, SD=5.66) while those without these diagnoses (n=63) had low scores in (M=2.8, SD=2.90), a significant difference (t(62.30)=4.91, p= .0001), indeed quite similar to those of Ehlers' learning disorders group (table 1). Cases with non-neuropsychiatric disorders like any anxiety disorder (M=41) (M=4.1, SD=4.20) did not differ from those without that co-morbidity (n=68) (M=5.0, SD=5.14, n.s.), nor did depressed cases (n=28) (M=4.50, SD=3.20) differ from non-depressed (n=81) (M=4.8, SD=5.26, n.s.). With regard to patients with a disruptive behavioral disorder (BD) (n=9) (M=6.2, SD=6.45), they did score higher as compared with those without that co-morbidity (n=100) (M=4.6, SD=4.65). However, the difference fell short of statistical significance. Also, we saw some gender differences: boys (n=49) (M=5.6, SD=5.37) scored

higher than girls (n=60) (M=3.9, SD=4.19) a difference approaching statistical significance (t(107)=1.83, p= .071). Also, adolescents (n=66) scores were somewhat higher (M=5.2, SD=5.07) than those of children (n=43) (M=3.9, SD=4.31), a non-significant difference.

Insert Table 1 about here

Using the full ASSQ scores, our patients scored lower than the Asperger patient and Attention- and behavioral disorders group of Ehlers et al. (1999) (see table 1). The diagnostic combination that he used, that of any Attention deficit disorder or any behavioral disruptive disorder (ADDBD) applied in our sample showed that those with ADDBD (n=25) (M=6.5, SD=6.09) scored higher on the ASSQ-R than those without ADDBD (n=84) (M=4.2, SD=4.25), a significant difference (t(107)=2.15, p= .034).

However, our patients scored higher than both the Learning disorders (Ehlers, S., Gillberg, C., & Wing, L., 1999) and community sample scored (by the teacher) (Ehlers, S., 1997).

Correlates of ASD-symptoms

To investigate the role of co-morbidity, and the role of OCD severity to ASD traits using the ASSQ scores, a first step investigating the correlation pattern was performed. The correlation matrix included the presence/absence of several diagnoses, e.g. any tic-disorder, any anxiety disorder, any depressive disorder, any ADHD disorder, any disruptive behavior disorder and any autism spectrum disorder. Also, we entered the CYBOCS total score, gender and age group of the patients. To ensure that aspects of OCD severity that might not be included in the CYBOCS total score, the global severity of the disorder as defined by the Clinical Global Impression (CGI) was used as well. Also, the correlation matrix included some other

CYBOCS scales that cover other aspects of OCD phenomenology (e.g. avoidance, indecisiveness, exaggerated sense of responsibility, inertia and pathological doubt). We used the 10 log of the ASSQ-R to approach the normal distribution. The significant Spearman rho correlation coefficients between the 10 log ASSQ-R and these factors were: Gender (r=.2, p= .04); any tic disorder (r= .27, p= .005); Any ADHD disorder (r= .21, p= .03); Any ASD disorder (r= .37, p= .0001); Inertia (r= .32, p= .001) and Pathological Doubt (r= .27, p= .007). However, the measures of OCD severity were not significantly correlated with the ASSQ-R: CYBOCS total score (r= .02, n.s.); CGI (r= .13, n.s.), nor Age (r=.08, n.s.) nor other diagnoses e.g. any depressive disorder (r= .08, n.s.); any anxiety disorder (r=- .08, n.s.) or any disruptive behavioral disorder (r= .05, n.s.). Nor did the level of insight in to how exaggerated or meaningless the OCD symptoms bear any relation to ASSQ scores (r= -0.08, n.s.) Thus, even if some OCD-symptoms were accompanied by lack of insight, this was probably not because these cases had more ASD-traits.

Variables that were significantly correlated were entered into univariate Analysis of Variance. The univariate ANOVAs predictors were all categorical variables (0/1) except pathological doubt and inertia that range from 0-4 and which were included as co-variates. First, all predictors in the fully factorial ANOVA (R^2= 0.45) (F (12, 99)= 5.85, p= .0001) were included. Then the model was purged stepwise from factors and interactions that were least significant.

The final model was statistically significant (F (5, 99)= 13.03, p= .0001) with a power that explained 41% of the total variance (R^2= .41). Any Autism spectrum disorder (F (1)= 33.3, p= .0001, eta^2=.26), any tic disorder (F (1)= 13.38, p= .0001 eta^2=.13), pathological doubt (F (1)= 17.93, p= .0001 eta^2=.16) and any tic disorder by gender interaction (F (1)= 5.13, p= .008 eta^2= .10) contributed. The latter term indicated that girls without a tic disorder had low

scores, but that girls with tics had higher scores at the same level as boys whose scores did not vary substantially with the presence or absence of a tic disorder.

4. Discussion

The study indicates that autism spectrum disorder (ASD) traits are quite common in OCD-patients and that high levels of symptoms are to a significant part related to co-morbid autism spectrum disorders. However, ASD traits were also associated with other co-morbid problems, i.e., tics/Tourette's disorder and ADHD. Furthermore, about 60% of the variance was not explained, which might indicate that the OCD itself is associated with some lower level of ASD traits. However, residual ASD symptoms, when those associated with ASD, ADHD and tics/Tourette were accounted for, was at a comparable level to those found by Ehlers to be associated with a group of children with learning disorders (Ehlers et al., 1999). Also, OCD cases that had ADHD and/or disruptive behavioral disorders (n=25) scored somewhat comparably to children and adolescents in the Ehlers' study that had the same problems. There was no relationship between the OCD-patients' level of insight into the meaningless, or exaggerated nature of their symptoms and the ASD-traits assessed by the ASSQ.

The study does in some respects replicate the findings of Geller with regard to child studies (Geller et al., 2000) and with regard of adult studies, those of Bejerot (2001) who noted autistic traits in a sub sample of adult OCD-patients, as well as those of LaSalle who found ASD diagnoses in a substantial minority (2.7%) (LaSalle et al., 2004). It is clear, that the prevalence of ASD, including Asperger's syndrome is substantially higher than that of the general child and adolescent populations whether Nordic (Ehlers & Gillberg, 1993; Ellefsen et

al., 2006) or international (Baird et al., 2006; Fombonne, 2005) (for a review, see (Williams et al., 2006). A difficult question is whether our data might indicate a higher overall prevalence of ASD in Sweden, and that consequently, our data merely mirror this elevated prevalence. However, the data on this issue are mixed as the prevalence of ASD in Sweden has ranged from a high of 60 per 10 000 to 2-3 per 10 000 (Williams et al., 2006). Probably, method- and criteria variance plays the most important role in the various prevalence figures from Sweden. However, we cannot fully rule out some contribution from a higher prevalence rate in Sweden as compared with other countries. Also, using a method as ASSQ for dimensional assessment of ASD traits and the ASQ to support our neuropsychiatric assessment, we cannot equate our prevalence rate for ASD-traits and ASD in an OCD population with that of a carefully performed representative epidemiological study.

Previous data from the adult perspective, e.g. Bejerot (Bejerot et al., 2001) did not approach the question of the origin of sub-syndromal autistic traits, nor has this issue been raised in pediatric OCD studies (to my knowledge), whether this was due to co-morbidity with sub-threshold ASD syndromes, or whether these traits were in some way “intrinsic” to that sub-group of OCD-patients.

It does not seem viable to hypothesize that the parents rated the fact that the children are troublesome at home as the presence of ASD traits. If that had been the case, one would had expected the presence of ODD and CD to be associated with significantly elevated ASSQ scores as well, which was not the case. Nor did the severity of OCD as reflected in the CYBOCS total score or the global severity as expressed by the CGI score affect the ASSQ scores substantially, although severity affected depressive symptom levels considerably.

The substantial correlations and inter-correlations between the ASSQ score, the co-morbidities, gender and age, as well as problems often present in OCD (e.g., inertia and pathological doubt), that are not necessarily, but often are, directly coupled with obsessions or compulsions indicated a need to better understand what are the most important predictors. ANOVA analysis with stepwise elimination of interactions and predictors, drew an interesting picture where co-morbid ASD, any tic/Tourette's syndrome, pathological doubt and gender by any tic/Tourette's syndrome interaction contributed. Our data indicate that girls had high ASSQ scores mostly in the presence of a tic disorder, while boys scored higher regardless of those disorders. In view of the fact that the ASD traits used in these analyses were those that are most specific to ASD and cannot be confused with OCD or tic symptoms, we can conclude that there is a presence of ASD symptoms in OCD, although at lower levels than in cases with these kinds of co-morbidities. The finding, that pathological doubt was a strong predictor of ASSQ scores, was intriguing. Pathological doubts are often seen in cases with aggressive or sexual obsessions and checking compulsions, symptoms that themselves are thought to be associated with tics co-morbidity. However, the ANOVA showed that these traits were associated with ASD traits apart and above that contributed by tics. Usually, the patients do remember that, for example, a compulsion has been performed, but still doubt their memory and have to repeat the compulsion. Could it be that ASD traits, as expressed in the ASSQ, reflect a lack of central coherence that is also expressed through doubting ones memories and even perceptions in OCD? Clearly, the relation between OCD and ASD needs to be investigated further. Moreover, stability of these symptoms needs to be assessed. It is conceivable that the ASD-symptoms might be less stable than, for example the Asperger syndrome, which, in a recent study was proved to be stable from childhood and adolescence into young adulthood both with regard to the symptoms themselves as well as to remaining impairment (Cederlund et al., 2007). This needs to be clarified.

The contention raised by Bartz, that OCD should best be conceptualized as an OC spectrum- rather than as an anxiety disorder (Bartz & Hollander, 2006) is neither proved, nor disproved through this study. However, the high level of ASD symptoms in our OCD patients, which partly are expressed through ASD diagnoses in a substantial minority, does indicate that there might be some underlying relationship. Possibly, the association of high ASSQ scores and pathological doubt might reflect issues of the underlying neuro-psychology of both disorders that is being something that both disorders might have in common. Also, in our study, tics were associated with elevated ASSQ scores, which, as tics are common in ASD (Canitano & Vivanti, 2007)), should be seen as in line with the contention of Bartz (Bartz & Hollander, 2006). ASSQ scores levels that were unaccounted for by these co-morbidities are higher than those of the general population, although at a level not too far different to those of learning disorders (Ehlers et al., 1999). It might be, as we state in limitations below, that this residue might rather reflect problems in assessment or measurement error than anything real.

Possibly, these difficulties in interpreting the results come from the dichotomous nature of diagnoses. As we understand the dysfunctional neuro-circuitry and dysfunctional neuropsychological functions that different symptoms are expressed through better, there might emerge specific reasons for the emergence of ASD traits in the different OC disorders.

However, we still have the question as to how meaningful the concept of OC-spectrum disorders is. The heuristic value, to find a greater unity beyond seemingly disparate phenomena, is a scientific quest in itself, and possibly understanding why ASD occur at about 10 times as often in OCD as in the general population will be of value. Genetic studies and the studies of endophenotypes might benefit articularly.

However, the OC-spectrum disorders concept tries to unify disparate symptom constellations. Using a behavioral analytic approach, OCD behaviors, despite some external similarities, have different functions than ASD behaviors. OCD behaviors intend to alleviate anxiety, disgust, unpleasant feelings or a sense of things being not "just right": An awareness of this state of affairs as being irrational is a defining feature, mostly present even in childhood. In these respects, OCD differs from ASD. Moreover, these features are the grounds for the success of cognitive behavioral therapy, using exposure with response prevention (E/RP) related techniques, that are virtually identical with the ones used in the classical anxiety disorders (Abramowitz et al., 2005). These facets are lacking in ASD, and with regard to CBT techniques in ASD, E/RP is of less use, while contingency management is useful. One could argue that these differences, locates OCD well in the anxiety disorder spectrum, while they locate ASD differently. With regard to neurochemical and psychopharmacological aspects, the SSRIs are useful agents in OCD, albeit with a lower effect size than that of CBT (Abramowitz et al., 2005) just as in the classical anxiety disorders (with similar effect sizes). In OCD, the effects of the SSRIs lies in decreasing anxiety which is at least as important, as decreasing repetitive behavior, while the contrary could be said to be true for the use of SSRIs in ASD (Hollander et al., 2005). So, in summary, we feel that there are still many issues to be clarified with regard to the correct nosological placement of OCD. Possibly, the heterogeneity of OCD (Ivarsson et al., 2007; Ivarsson & Valderhaug, 2006; McKay et al., 2004) is the problem and that one sub-sample of OCD might be more similar to the classical anxiety disorders while another sub-sample might be more akin to ASD. Studying the temperamental features of children and adolescents with OCD, we found that about half of the sample had low levels of activity, low levels of sociability and high levels of shyness (Ivarsson & Winge-Westholm, 2004). We hypothesized, that individuals who were most extreme with regard to low sociability and high levels of shyness might have ASD traits. In our study, the other half

showed normal sociability, activity, high levels of emotionality and low levels of shyness, rather different from what one would expect in an ASD-related sample.

Limitations

Using the ASSQ or, for that matter diagnostic interviews, we need also to consider that some of the symptoms or traits we measure might be an artifact of assessment. In diagnosing ASD and having the parents fill in questionnaires, we depend on their interpretations as well as their observations. Also, most questions are interpretatively rather than descriptively oriented, e.g., “Is regarded as a professor by the other children” or “Lacks common sense.” So, some part of the scores we have discussed, might be the result of faulty observations and/or faulty interpretations. What on the surface seems to be ASD traits in OCD, tics/Tourette, ADHD or in learning disorders might be, at least partly an expression of the difficulties parents have with these children and that all questions are not specific to ASD. Possibly, using a semi-structured interview like the Diagnostic Interview of Social- and Communication disorders (DISCO) (Wing et al., 2002), where problems in different social- and communicative situations are elicited might give more reliable estimates.

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