Autism Spectrum Disorder

Classification

Autism Spectrum Disorder (ASD; DSM-5, APA 2013) is a developmental disorder formerly characterized in ICD-10 and DSM-IV as a "triad of impairments" i.e. deficits in reciprocal social interaction and communication, and the presence of restricted, repetitive patterns of behaviour, interests or activities. In 2013 the latest revision of DSM (DSM-5) collapsed these into two core domains to reflect the fact that delays and abnormalities in language are not specific to autism and that almost all individuals with difficulties in reciprocal social interaction also manifest deficits in communication.

DSM-5 diagnostic criteria require individuals to show (currently or by history) persistent deficits in: (A) Social communication and social interaction across multiple contexts and (B) Restricted, repetitive patterns of behaviour, interests or activities. To meet criteria for domain (A) individuals must show deficits in: (i) emotional reciprocity (ii) non-verbal communicative behaviours used for social interaction and (iii) in developing, maintaining and understanding social relationships. To meet criteria for domain (B) they must show difficulties in at least 2 of the following: (i) stereotyped or repetitive motor movements (ii) insistence on sameness; inflexible adherence to routines or ritualized patterns of verbal or non-verbal behaviour (iii) highly restricted, fixated interests that are abnormal in intensity or focus, and (iv) hyper- or hypo reactivity to sensory input or unusual interests in sensory stimuli.

Symptoms must cause clinically significant impairment in social, occupational or other important areas of current functioning and are rated by severity ('requiring very substantial support"; "requiring substantial support" and "requiring support"). Symptoms must also have been present in early development although they may not become apparent until social demands exceed the individual's capabilities. Diagnostic ascertainment should also specify if the autism is accompanied by additional intellectual or language impairments; is associated with a known medical, or genetic condition or environmental factor; is associated with another neurodevelopmental, mental or behavioural disorder, or with catatonia.

Sub- categories of disorder that were included in DSM-IV such as Asperger syndrome or Pervasive Developmental Disorder no longer appear, although DSM-5 criteria specify that "Individuals with a well-established diagnosis of autistic disorder, Asperger's disorder or Pervasive Developmental Disorder should be given a diagnosis of Autism Spectrum Disorder"

Associated conditions

There is a significant association between ASD and a number of other conditions including ADHD, Tuberous Sclerosis and FragileX. Links with other conditions are also well documented (e.g. rubella, cytomegalovirus, phenylketonuria) although the phenotype in these cases tends to be atypical (Rutter, 2013). Epilepsy, often with onset in early teens, occurs in around 20-30%of individuals with comorbid intellectual disability, but rates are lower in those with normal IQ (Bolton, et al., 2011).

Regression in development, usually around the age of 12 to 24 months, has been reported in many studies although estimates vary from around 15% to as high as 50%. Pickles et al., (2009) suggest that language regression, in particular, is highly specific to ASD and may index an underlying neurodevelopmental anomaly

Genetics

The risk of ASD in siblings of probands is significantly increased and there is a high concordance rate in monozygotic twins. Family studies indicate that the "Broader Autism Phenotype" (i.e. having problems related to social, language and/or cognitive functioning) occurs in up to 20% of first-degree family members. Although ASD is clearly highly heritable, attempts to identify the specific genes involved have met with limited success (Rutter, 2013). Currently, up to 15% of cases of ASD appear to be associated with some form of genetic mutation and it is suggested that the identification of rare mutations (e.g. SHANK 3) and Copy Number Variations (CNV's; i.e. submicroscopic chromosomal deletions or substitutions) may provide evidence of the neural systems that underlie autism (Geschwind, 2011). However, Rutter (2013) notes that these may be related to intellectual disability as much as to autism. It is evident, too, that both common polymorphic variations and rare mutations play a role; there are also genes that are intermediate between rare and common. "The relative importance of rare, common and intermediate frequency genes has yet to be established" (Rutter, 2013).

There is no evidence that single environmental factors (e.g. MMR or other vaccines) cause ASD although more complex environmental risk factors (e.g. immune system abnormalities; pre or peri- natal perturbations etc.) cannot be ruled out and the influence of factors such as high maternal (Sandin et al., 2012) or paternal age (Hultman et al., 2011) remains unclear. Moreover, since autism is clearly a multifactorial disorder, the impact of gene-environment interactions must also be considered, although current understanding of the complex mechanisms involved in gene x environment interactions in autism is very limited

Prevalence

Although estimates vary, recent epidemiological research suggests that prevalence rates for both children (Baird et al., 2006) and adults (Brugha et al.,2011) are around 1%

Physical Phenotype

This is usually normal although minor physical anomalies are not uncommon. Enlarged head circumference and atypical patterns of cerebellar developmental have been reported (e.g. Courchesne et al., 2011) although the findings are not entirely consistent and Chawarska et al. (2011) suggest that the increase in brain size may be associated with increased body size, rather than being a distinctive brain feature.

Life expectancy/natural history

Life expectancy appears normal. Many individuals, especially those who are more able show improvements in core autism symptoms and behavioural difficulties with age. Outcome is significantly associated with factors such as IQ and severity of social impairment, but prognosis is also affected by the adequacy of educational, occupational and other support systems (Howlin et al., 2013).

Behavioural and cognitive characteristics

As noted above, ASD is defined by impairments in reciprocal social communication and the presence of ritualistic and stereotyped behaviours/interests. Onset of language is typically delayed but significant delays in language are less common in children of average or above IQ. Although frequently associated with intellectual impairment, recent studies suggest that up to 50% of individuals with ASD may be of average intellectual ability (Baird et al., 2006). In children, non-verbal IQ is frequently higher than Verbal IQ, although this pattern may be reversed in older, more able individuals.

Outcome

Functioning in adulthood is determined both by innate cognitive abilities and the levels of educational and post-school support provided. Mental health problems, especially related to anxiety and depression, often emerge in late adolescence/ early adulthood although estimates of rates of mental health disorders vary widely. Some studies suggest that up to 70% of individuals with ASD have one or more comorbid mental health disorders but in non-clinical adult samples, in which detailed psychiatric assessments have been conducted, rates are much lower, at around 22% (Hutton et al., 2008)

Websites

www.nas.org.uk www.researchautism.net

References

1.Baird G., Simonoff E., Pickles A. et al. (2006) Prevalence of disorders of the autism spectrum in a population cohort of children in South Thames: The Special Needs and Autism Project (SNAP). Lancet 368, 210-21

2. Bolton P.F., Carcani-Rathwell I., Hutton J., Goode S., Howlin P. & Rutter M. (2011) Features and correlates of epilepsy in autism. British Journal of Psychiatry 198, 289-294

3. Brugha,T.S., McManus,S., Bankart,J., et al. (2011). Epidemiology of autism spectrum disorders in adults in the community in England. Archives of General Psychiatry 68(5):459-466.

4. Chawarska, K., Campbell, D., Chen, L. et al. (2011) Early generalized growth in boys with autism. Archives of General Psychiatry, 68, 1021-1031

5. Courchesne, E., Webb, S. & Schumann, C. (2011) From toddlers to adults: the changing landscape of the brain in autism. In D. Amaral, G. Dawson, & D Geschwind (Eds) Autism Spectrum Disorders (pp. 875-892) New York: Oxford University Press.

6. American Psychiatric Association (2013) Diagnostic and Statistical Manual of Mental Disorders, Fifth edition (DSM-5) Washington DC

7. Geschwind, D (2011). Autism genetics and genomics: a brief overview and synthesis. In D. Amaral, G. Dawson, & D Geschwind (Eds) Autism Spectrum Disorders (pp. 812-826) New York: Oxford University Press

8. Howlin, P., Moss, P., Savage, S., & Rutter, M. (2013) Social outcomes in mid to later adulthood among individuals diagnosed with autism and average non-verbal IQ as children. Journal of the American Academy of Child and Adolescent Psychiatry, 52, 572-581

9. Hultman C., Sandin, S., Levine, S. et al. (2011). Advancing paternal age and risk of autism: new evidence from a population based study and a meta-analysis of epidemiological studies. Molecular Psychiatry, 1203-1212, 1

10. Hutton J., Goode S., Murphy M., Le Couteur A. & Rutter M. (2008) New onset disorders in individuals with autism. Autism 12, 373-90

11.Pickles, a., Simonoff, E., Conti-Ramsden, G. et al., (2009) Loss of language in early development of autism and specific language impairment. Journal of Child Psychology and Psychiatry. 50, 843-852.

12. Rutter, M (2013). Changing concepts and findings on autism. Journal of Autism and Developmental Disorders (43, 1749-1757

13. Sandin, S., Hultman, C.M., Kolevzon, A. et al. (2012) Advancing maternal age is associated with increasing risk for autism: a review and meta-analysis. Journal of the American Academy of Child and Adolescent Psychiatry, 51, 477-486

Patricia Howlin, 2013
