Autism Spectrum Disorder

Classification

Autism Spectrum Disorder (ASD) is a pervasive developmental disorder characterized by deficits in reciprocal social interaction and communication, and the presence of restricted and repetitive behaviour patterns (Diagnostic and Statistical Manual [DSM]-5; American Psychiatric Association, 2013). 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 previously included in DSM-IV (e.g. Asperger Disorder, Autistic Disorder, Pervasive Developmental Disorder NOS) are no longer specified in DSM-5. However, DSM-5 notes 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 developmental and genetic disorders including ADHD, Tuberous Sclerosis and Fragile X. There are links, too, with conditions such as maternal rubella, cytomegalovirus and phenylketonuria although the phenotype in these cases tends to be atypical (Rutter, 2013). There is an increased risk of epilepsy in ASD, especially among individuals with comorbid intellectual disability (estimated rates 20-30%). ASD is also more common in individuals with epilepsy and among their siblings and children, than in the general population, indicating shared aetiology and overlapping inheritance (El Achkar & Spence, 2015).

Regression in development, usually around the age of 12 to 24 months, has been reported in many studies. Although estimated rates vary, a recent meta-analysis suggests that a significant loss of skills egression occurs in around 32% of young children with ASD. The most common forms of regression affect social and /or language development (Barger et al., 2013).

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 highly heritable there is wide genetic heterogeneity, with multiple modes of inheritance including high rates of de novo mutations and a wide range of possible rare and common copy number variations (CNV's; i.e. submicroscopic chromosomal deletions or substitutions). Diverse clinical phenotypes and limited sample sizes add to the challenges of identifying the specific genes involved and currently only around 10% to 15% of cases of ASD appear to be associated with a known genetic mutation (Bourgeron, 2016; Krishnan, et al., 2016).

More recently, research has begun to focus on the impact of gene-environment interactions and a number of potential environmental risks has been identified (Mandy and Lai, 2016). These include high maternal and paternal age; maternal health factors such as obesity or drugs taken during pregnancy (e.g. thalidomide, SSRI's and Valproate); immune system abnormalities; pre or peri- natal perturbations, and pre-natal exposure to pollutants and pesticides. However, there is no evidence that MMR or other vaccines are a cause of ASD

Prevalence

Data from epidemiological studies are variable, with recent estimates ranging from 1 in 68 (Christensen et al., 2016) to 1 in 145 (Hill et al., 2015). The latter figure is based on studies of all ASDs combined, conducted in different regions and countries by different teams, although the authors acknowledge that this is a conservative estimate. UK data indicate that the combined prevalence of ASD in adults of all ages in England was 11/100 (95% CI 3–19/1000); rates were higher in individuals with moderate to profound intellectual disability

Physical Phenotype

There is no distinct physical phenotype although minor physical anomalies and dysmorphic features are common. Data suggesting enlarged head circumference and atypical patterns of cerebellar developmental (e.g. Courchesne et al., 2011) are inconsistent (Dinstein, et al., 2017). There are, however, increased rates of chronic and acute medical problems across the life span (Jones et al., 2016).

Life expectancy/natural history

Premature mortality, especially among individuals of lower IQ, has been reported in a number of recent studies (cf Hirvikoski, et al., 2016). Increased mortality is associated with a range of disorders of the nervous, circulatory, respiratory and digestive systems. Epilepsy is the most common cause of early death in individuals of low IQ. In high-functioning individuals with ASD there is an increased risk of suicide.

Behavioural and cognitive characteristics

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, up to 50% of individuals with ASD are of average intellectual ability (Brugha et al., 2016). In children, non-verbal IQ is frequently higher than Verbal IQ but this pattern may be reversed in older, more able individuals.

Outcome

Longitudinal studies indicate that many individuals, especially those who are more able, show significant improvements in core autism symptoms and behavioural difficulties with age. However, prognosis is affected by many individual and environmental factors, including IQ and severity of social and communication impairments, and the adequacy of educational, occupational and other support systems (Howlin and Magiati, 2017). Studies focusing on quality of life generally indicate that this is poor (Ayres et al., 2017). Mental health problems, especially related to anxiety and depression, often emerge in late adolescence/ early adulthood. Estimated rates of mental health disorders vary widely but are generally between 40%-60% depending on the samples studied (Moss et al., 2015; Russell et al., 2016).

Websites:

www.nas.org.uk

www.researchautism.net

www.autistica.org.uk

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