

SHORT COMMUNICATION

Autism Spectrum Disorders in Childhood: An Overview

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ABSTRACT

Autism is a collective term for various profound developmental disorders (autism spectrum disorders, ASD). Most affected individuals have problems with social contact as well as communication and language. Many shows repetitive, stereotyped behaviors and interests. Autism (Early Childhood Autism, Autistic Disorder, Asperger Syndrome, etc.) is a profound developmental disorder that is based on complex disorders of the central nervous system - especially in the area of perceptual processing - and begins in childhood. At its core is a severe relationship and communication disorder. The effects of the disorder interfere in multiple ways with relationships with the environment, participation in community life, and the ability to fit into society, as cognitive as well as language, motor, emotional, and interactional functions are affected. In addition, there are numerous behavioral abnormalities that can be very stressful, especially for caregivers in their daily interactions with autistic people. Autistic people are thus usually multiply disabled. As with all multiple disabilities, the focus of the disability shifts in the course of development with age.

INTRODUCTION

Historical Aspects

Swiss psychiatrist Eugen Bleuler coined the term autism around 1911 as part of his research on schizophrenia. He initially applied it only to this disorder and wanted to describe one of its basic symptoms - the withdrawal into an inner world of thoughts. Bleuler understood autism to mean "detachment from reality together with the relative or absolute predominance of the inner life". Sigmund Freud adopted the terms "autism" and "autistic" from Bleuler and roughly equated them with "narcissism" and "narcissistic," respectively - as the opposite of "social." The meaning of the term changed over time from "living in one's own world of thought and imagination" to "self-centeredness" in a general sense. Hans Asperger and Leo Kanner then adopted the autism concept, possibly independently. However, they no longer saw in it only a single symptom, but tried to capture with it an entire disorder of its own kind. They distinguished people with schizophrenia, who actively withdraw into their inner self, from those who live in a state of inner withdrawal from birth. The latter now defined the

term "autism." Kanner defined the term "autism" narrowly, which essentially corresponded to what is now called early childhood autism (hence: Kanner syndrome). His view achieved international recognition and became the basis for further autism research. Asperger's publications, on the other hand, described "autism" somewhat differently and were initially hardly noticed internationally. Hans Asperger himself assumed a positive long-term course. As a rule, people with Asperger syndrome learn in the course of their development to compensate more or less well for their problems, depending on the degree of their intellectual abilities. British autism expert Tony Attwood compares the developmental process of people with Asperger syndrome to the creation of a jigsaw puzzle: over time, they get the individual pieces of the puzzle together and recognize the whole picture. This allows them to solve the puzzle (or riddle) of social behavior." Eventually, people with Asperger syndrome can reach a status where their disorder is no longer noticeable in everyday life. A number of books exist about autistic people. Neurologist Oliver Sacks and psychologist Torey L. Hayden have published books about their patients with autism and their lives. Of books written by autistic people themselves, the works of the U.S. animal scientist Temple Grandin, the Australian writer and artist Donna Williams, the U.S. educationalist Liane Holliday Willey and the German writer and filmmaker Axel Brauns are particularly well known.

Statistics in Autism

Autism, from the ancient Greek *autós* 'self', is a profound developmental disorder [1-4]. An analysis of 11,091 interviews by the U.S. National Center for Health Statistics found a prevalence (lifetime prevalence) of ASD of 2.24% in the 3 years - 17 years age group, 3.29% in boys, and 1.15% in girls. A 2015 review showed that gender distribution figures varied widely due to methodological difficulties. However, the male-to-female ratio was at least 2:1 to 3:1, suggesting a biological factor in this issue. The number of autism cases appears to have risen sharply in recent decades. The Centers for Disease Control (CDC) in the U.S. reports a 57% increase in autism cases (between 2002 and 2006). Autism affects 1 in 110 children by age 8. Although better and earlier diagnosis plays a role, according to the CDC, it cannot be ruled out that some of the increase is due to an actual increase in cases. Autism, however, is not only present as a disorder in the population, but also as a personality trait that lies on a continuum. Associated with this personality trait are several characteristics, such as poorer social skills and increased attention to detail. The following factors play a role in the recent increase in the number of cases: More frequent attendance at kindergarten and earlier enrolment of children in school increase the chance that autism will be detected. Parents today observe more attentively whether their children are developing "normally". In the past, people often did not bring a child to the doctor until he or she was conspicuously late in learning to speak. The definition of autism has broadened so that more children are diagnosed as autistic. In the past, autism was often classified under childhood schizophrenia or attention-deficit/hyperactivity disorder.

Causes and Possible Triggers in Autism

Possible causes or triggers of autism are being researched today in various scientific fields. However, the claims that autism is caused by a cold mother (the so-called "refrigerator mother"), loveless upbringing, lack of attention, or psychological trauma, which were still held until the 1960s, are now considered to have been disproved. The biological causes of the entire autism spectrum lie in developmental biological deviations in the formation and growth of the brain. According to current research, both anatomy and function are altered, and in particular the formation of certain nerve connections. The subject of research is the possible causes of these deviations, which primarily - but not only - affect embryonic development. In addition to specific inherited

genetic conditions, all factors that influence the work of genes in critical time windows are in principle considered (teratology). The genetic causes of the overall autism spectrum have been shown to be extremely diverse and highly complex. Around 100 genes and 44 gene loci were already identified as candidates for involvement, and it was suspected that the numbers would continue to rise sharply. It is generally assumed that the immense potential for combination of many genetic abnormalities is the cause of the great diversity and breadth of the autism spectrum. It has become increasingly apparent that, in addition to the longer-known hereditary changes, sub-microscopic changes in chromosomes play a key role in autism in particular, namely copy number variations. Primarily, these are gene duplication or gene deletion. They arise during the formation of oocytes from the mother or sperm from the father in meiosis. That is, they arise anew and de novo. However, if a child receives such a deviation from one parent, it can pass it on, with a probability of 50%. Thus, it is possible for a deviation that contributes to autism to occur only once in a child and not be passed on, or to affect multiple family members in different generations. In the latter case, moreover, the pervasiveness (penetrance and expressivity) of such a genetic abnormality may be highly variable from person to person. Identical twins usually both exhibit autism spectrum disorder. Exceptions in this regard are attributed to environmental factors and epigenetic influences. Modern analysis methods, like DNA chip technology, allow the identification of genetic abnormalities (karyotype analysis) leading to the expression of the spectrum disorder, and the involvement of family members is often helpful or even necessary. The results can then form the basis of genetic counselling. There was conflicting evidence on the hypothesis that systems of mirror neurons may not be sufficiently functional in people with autism. A meta-analysis then found that there was little to support the hypothesis, and that the data was more consistent with the assumption that descending (top-down) modulation of social responses was atypical in autism. Although digestive abnormalities have often been described in the context of ASD. There are no reliable data on a possible correlation or even a possible causal relationship - either one way or the other. The theory that masculinization of the brain (Extreme Male Brain Theory) due to high testosterone levels in the womb could be a risk factor for ASD has been specifically investigated in recent studies but could not be confirmed. Diffusion tensor imaging (DT-MRI) allows reconstruction of neural pathways in the brain (tractography). A group of researchers led by Marcel Just and Nancy Minshew at Carnegie Mellon University in Pittsburgh (USA) discovered the phenomenon of altered connectivity (large-scale information flow) in the brain in the group data of 17 subjects from the Asperger's range of the autism spectrum. Functional brain scans (fMRI) showed both areas of increased and decreased activity compared to the control group, as well as decreased synchronization of the activity patterns of different brain areas. There were suspicions that environmental toxins or vaccine additives (thiomersal) could promote the development of autism. It usually occurs before the age of three and may manifest in one or more of the following areas: Problems in reciprocal social interaction and exchange (such as understanding and building relationships). Abnormalities in speech and nonverbal communication (such as eye contact and body language), restricted interests with repetitive, stereotypical behaviors. Affected individuals are referred to as autistic or as autistic. Because of their limitations, many autistic individuals require help and support, sometimes for life. Autism is independent of intelligence development, but intelligence impairment is among the common additional limitations. Despite extensive research efforts, there is currently no universally accepted explanation of the causes of autistic disorders. The currently valid German classification system ICD-10 distinguishes between different forms of autism (such as early childhood autism, atypical autism and Asperger syndrome). The DSM-

5 and the ICD-11, valid from 2022, on the other hand, no longer include subtypes and speak only of a general autism spectrum disorder. The reason for this change was the increasing recognition in science that a clear delineation of subtypes is not possible - and instead one should assume a smooth transition between mild and more severe forms of autism. This group of disorders is characterized by qualitative deviations in reciprocal social interactions and communication patterns and by a restricted, stereotyped, repetitive repertoire of interests and activities. These qualitative abnormalities are a fundamental functional feature of the affected child in all situations.

CONSEQUENCES AND PROGNOSIS

Autism can significantly affect personality development, employment opportunities, and social contacts. The long-term course of an autism spectrum disorder depends on the individual manifestation in each patient. The cause of autism cannot be treated because it is not known. Only supportive treatment in individual symptom areas is possible. On the other hand, many difficulties that autistic people report are preventable or diminishable through adjustments to their environment. For example, some report a sensitivity to pain at certain sound frequencies. Such people do much better in a low-stimulus environment. Finding or creating an autism-friendly environment is therefore an essential goal. Communication training for autistic people as well as for their friends and relatives can be helpful for all involved and is offered and scientifically developed for example in Great Britain by the National Autistic Society. An increasing number of schools, colleges and employers specifically for autistic people demonstrate the success of allowing autistic people to live in autism-friendly environments. Autistic syndromes belong to the group of mental disabilities according to the (German) law on severe disabilities. According to the principles of the Versorgungsmedizin-Verordnung, the degree of disability is 10 to 100, depending on the extent of social adjustment difficulties. In early childhood and atypical autism, improvement of the symptom picture usually remains within narrow limits. About 10-15% of people with early childhood autism achieve independent living in adulthood. The rest usually require intensive, lifelong care and sheltered housing. There are no studies yet on the long-term course of Asperger's syndrome. Which school is appropriate for people with autism depends on the individual's intelligence, language development and expression of autism. If intelligence and language development are normal, children with autism can attend a mainstream school. Otherwise, attendance at a special school may be considered. However, many individuals with autism are not diagnosed until after they have completed their schooling. With regard to education and occupation, the individual's level of development must also be considered. If intelligence and language development are normal, regular studies or vocational training can be pursued. Otherwise, a job in a workshop for people with disabilities may be an option. In any case, it is important for the integration and self-esteem of autistic people to be able to pursue an activity that corresponds to their individual abilities and interests. On the one hand, entering regular working life can be problematic, as many autistic people are unable to meet the high social demands of today's working world. For example, according to a study published by Rehadat, only about ten percent of autistic young people are able to meet the requirements of vocational training, since "in addition to the level of cognitive performance achieved, psychopathological abnormalities are decisive for trainability," which requires patience and possibly a longer phase of vocational preparation in order to avoid rejecting young people who are in principle capable of training. Understanding supervisors and colleagues are essential for people with autism. Also important are regulated work processes, clear tasks, manageable social contacts,

unambiguous communication and the avoidance of polite phrases, which can lead to misunderstandings. On the other hand, people with autism syndrome and the partial performance strengths ("island giftedness") that may be associated with it are sometimes just particularly well suited for certain professions or activities, e.g., in computer science, etc. Many autistic people also meet the requirements for university studies due to their cognitive performance, which, however, can drag on due to the structure not being firmly prescribed. In some cases, special placement agencies exist: In an ecological worldview, the goal is for very different people living together in an "ecosystem" (in the case of humans, a socio-economic ecosystem) to find suitable niches in which they can do well. Finding or creating an autism-friendly environment, such as specialized schools, is therefore an essential goal.

TREATMENT OPTIONS IN AUTISM

Based on individual development, a plan is drawn up in which the type of treatment for individual symptoms is determined and coordinated. In accordance with the Convention on the Rights of Persons with Disabilities (UN Convention on the Rights of Persons with Disabilities), a suitable environment should be created in which all those involved learn how best to take account of the child's characteristics. In the case of children, the entire environment (parents, families, kindergarten, school) is included in the treatment plan. Services for adults are only beginning to be developed in many places. An overview of applications, therapies and interventions has been published by the English National Autistic Society. A selection of treatment methods will be briefly presented below. For treatment in adults, a comprehensive review by the Freiburg Autism Study Group is available. The systematic evaluation of treatment trials in older adolescents and adults is - in contrast to the situation in children - still unsatisfactory, which has been attributed to the historically later attention in the coverage of these age groups. Behavior therapy is the most scientifically validated form of therapy in autism therapy. A comprehensive study is available on the effective factors of behavior therapy in autism. The goal is to reduce disruptive and inappropriate behaviors such as excessive stereotypies or (auto)aggressive behavior on the one hand, and to build up social and communicative skills on the other. In principle, the approach is to consistently and recognizably reward desired behavior (positive reinforcement). Behavioral therapies can be either holistic or focused on individual symptoms. Applied Behavior Analysis (ABA) is a holistic form of therapy developed by Ivar Lovaas in the 1960s. This form of therapy is geared toward early intervention. First, a systematic approach is used to determine which abilities and functions the child already possesses and which he or she does not. Based on this, special programs are created to enable the child to learn the missing functions. The parents are involved in the therapy. The procedures of ABA are essentially based on methods of operant conditioning. The main components are reward for correct behavior and extinction for incorrect behavior. Learning trials and successes and desired behavior are reinforced as directly as possible, using primary (innate) reinforcers (such as food) and secondary (learned) reinforcers (such as toys) to reward desired behavior. There are currently only two institutes in Germany that offer this therapy. Autistic people often reject ABA because of the deprivation of self-determination. Another holistic educational support concept is TEACCH (Treatment and Education of Autistic and related Communication-handicapped Children), which addresses both children and adults with autism. TEACCH is designed to improve the quality of life of individuals with autism and guide them to navigate everyday life. Central assumptions of the concept are that learning processes can be initiated through structuring and visualization in people with autistic traits. Parents of autistic children have been shown

to experience significantly more stress than parents of children with other deviations or disabilities. Reducing parents' stress shows significant improvements in the behavior of their autistic children. There is strong evidence for a relationship between parents' stress levels and their children's behavior problems, regardless of the severity of autism. Behavioral problems in children do not show up before, but also during, increased stress levels in parents. The National Autistic Society has developed the "NAS EarlyBird" program, a three-month training program for parents to effectively prepare them to deal with autism. Drug treatment of associated symptoms, such as anxiety, depression, aggressiveness, or compulsivity with antidepressants (such as SSRIs), atypical neuroleptics, or benzodiazepines can be a component in the overall treatment plan (Risperidone, Aripiprazole, Clozapine, Fluoxetine, Oxytocin nose spray). However, it requires special caution and careful monitoring, because it is not uncommon for them to exacerbate symptoms instead of alleviating them if used incorrectly.

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