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## Review Article

### Treatment and Accommodation in Society for Autism Spectrum Disorder: Focused on Adult Cases

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## Abstract

The number of adults diagnosed with Autism Spectrum Disorder (ASD) have been increasing recently because they have difficulties of social functioning as adult. Characteristics, and treatment and accommodation in society of adults with ASD are reviewed in this article. The symptoms of ASD are discovered in the age of preschool and elementary school. Their symptoms have been sometimes disappeared according to their growing and they have not filled DSM-5 diagnostic criteria of ASD. However, there remains restricted topics, disability of empathy, and other ASD characteristics. Anxiety disorder and other psychiatric disorders are often found in adults ASD. Some show good social functioning if they are not affected with intellectual disability nor insisting on specific behaviors. ASD is thought to be syndromes with multiple genetic factors. About 30 years ago, the deficit of "Theory of Mind" was to be main cause of ASD. However, conjugate gaze is not developed in baby age, and persons with ASD cannot percept expression of face without concrete direction. So social motivation deficit is thought to be one cause of social dysfunction. We do not have medications to cure core deficits of ASD until now. Anti-depressants are used for anxiety or depressive symptoms and atypical anti-psychotics for self-injury or repetitive behaviors, although there is not robust evidence. Social skills training to enhance social learning is recommended though little evidence. So, both model to treat and social model to accommodate reasonably to

environment are important. There have been increasing competitive employments in Japan owing to obligation to employ persons with disabilities. Employers need to change rules or conditions flexibly which are determined by majorities in society conforming to Labor Standards in Japan, that are called reasonable accommodation. Under such labor conditions, other persons with or without disability can work easily.

**Keywords:** adults with autism spectrum disorder (ASD), medical model, social model, reasonable accommodation, social motivation

### Introduction

The number of people who are diagnosed with developmental disorders for the first time in adulthood is increasing. This is considered to be due to the impact of changes in the diagnostic criteria published in Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5),<sup>3)</sup> which now allows for diagnosis in adults. Moreover, among those who “somehow don't seem to get along in society,” there are many people with developmental disorders who have been blessed with intellectual ability and a good environment and have been able to get along without problems, but who encounter difficulties only when they are required to function as adults in university or workplace. In a Swedish study that followed local children using the same diagnostic criteria over a period of more than 20 years,<sup>26)</sup> the rate of autism diagnosis in 7-year-olds was 0.7% in 1983 and 1% in 1999; it is

possible that various sociocultural factors led to this increase.

In this paper, we will focus on autism spectrum disorder (ASD) in adulthood, which is one of the developmental disorders, and after giving an overview of its characteristics, we will look at treatment and support methods. This is because, at present, I believe that there is insufficient consensus on appropriate treatment and support. As there have been many clinical trials conducted mainly on children with regard to the characteristics of social functioning and the social brain, with the same being true for treatment, we will also cite findings from studies involving children where appropriate. In the introduction to papers that conform to DSM-5<sup>3)</sup> (2013), the term ASD will be used, and in the introduction to papers that predate this, the term autism or Asperger's disorder will be used. Furthermore, to avoid complications, we will use the terminology from DSM-5 for

other mental disorders (in accordance with the Japanese Society of Psychiatry and Neurology's guidelines for translating disease names and terms).

## I. Overview of ASD

### 1. Changes associated with growth

DSM-5 defines ASD as a spectrum that includes Asperger's disorder, etc., and as criteria for diagnosis, it is now essential that social communication and reciprocal interaction are impaired, and that behavior, interests, and activities are limited to a narrow range and repeated. Communication disorders encompass a wide range of difficulties, including verbal expression, verbal comprehension, and gestures. As ASD is a spectrum disorder, it is considered that there are multiple groups with different neurodevelopmental disorders.<sup>33)</sup>

The incidence rate is around 1% for both children and adults.<sup>46)</sup> Around 30% of people with this disorder also have intellectual disabilities.<sup>36)</sup> The symptoms are most commonly expressed during the period from early childhood to the beginning of elementary school. Thereafter, depending on the environmental and support factors, various developmental stages are achieved. In a study comparing symptoms at the ages of 5 and 13,<sup>51)</sup> in some cases where the child had healthily developed and no longer

met the diagnostic criteria for autism, improvements were noted in language ability and social relationships. In half of the cases, autistic isolation also improved, and as a result, there were cases where the child became more interested in society, giving the impression of being proactive but strange to those around them.

The symptoms of ASD, which change as the child develops, are the same as in early childhood, with some children having difficulty with social interaction and others being stereotyped or having a narrow range of interests and fixating on specific behaviors, but in many cases the severity of the condition eases as the child grows up.<sup>62)</sup> Even if speech and word comprehension improve, some characteristics such as monotonous intonation may remain. Eye contact and conflicts with others may also improve. Conversely, there are cases where obsessive behaviors are the main symptom, and there are often no changes in impulsive behavior, self-injurious behavior, or fixation on strange interests.<sup>7)</sup> In adult cases of ASD, there is fixation on limited topics, monotony of intonation, low empathy, and difficulty in distinguishing emotional nuances. The male-to-female ratio is about 4 to 1, with more men than women, but women are more likely to improve their communication skills than men.<sup>32)62)</sup>

## 2. Similarities with personality disorders

There are known symptoms that are common to personality disorders,<sup>62)</sup> such as the rigidity, impulsiveness, and isolation seen in schizoid personality disorder and schizotypal personality disorder, which belong to Cluster A, as well as a lack of interest in other people, a lack of emotional responses, a lack of two-way interpersonal relationships, and difficulty integrating communication and bringing things to a conclusion. In addition, there may be symptoms similar to those of Cluster C (avoidant or obsessive-compulsive personality disorder), such as hypersensitivity to criticism, neurotic tendencies, avoidance tendencies, and obsessive behaviors. According to the DSM-5's operational diagnostic criteria, if any of the symptoms of a mental disorder are considered to be present, the diagnosis of a personality disorder cannot be made; therefore, a diagnosis of ASD is given. Many family members of people diagnosed with ASD have these characteristics, and some people see them as having a broader autism phenotype (BAP).<sup>35)</sup> There is still a lack of evidence to support the adoption of multidimensional diagnosis, so despite these problems, it is an issue for the future.

## 3. Co-occurring mental disorders

It is well-known that adults with ASD often have co-occurring mental disorders, including mood disorders. Lever, A.G. et al.<sup>34)</sup> reported that the lifetime prevalence of depressive or bipolar disorders in adults with ASD is 26-57%, and that anxiety disorders, particularly social anxiety disorder, are also common. The comorbidity rate with attention-deficit/hyperactivity disorder (ADHD) is reportedly 14%. Because of the clearly notable symptoms, it is sometimes overlooked that the person has ASD, and in cases of ASD that are accompanied by intellectual disability, it can be difficult to make a diagnosis because symptoms such as depression are not typical due to self-injurious and aggressive behaviors. Eating and obsessive-compulsive disorders are also known to often occur in combination. For more information on diagnosis and treatment methods, please refer to Feature Article<sup>39)</sup> if you are interested. Lever et al.<sup>34)</sup> reported that older adults generally have fewer comorbid psychiatric disorders than younger adults.

## 4. Behavioral abnormalities

The behavioral abnormalities that characterize ASD include stereotyped movements, a preoccupation with always being in the same state, unusual interests, limited interests and concerns,

and compulsive behaviors. Uljarević, M. et al.<sup>61)</sup> conducted exploratory structural equation modeling based on data scored on one of four representative scales for ASD from a database published in Australia. A three-factor structure model was produced, with the three factors being: stereotyped movements, a preoccupation with always being in the same state, and unusual or limited interests and concerns. No clear explanation has yet been given to the question of why certain abnormal behaviors and communication and interaction disorders co-exist from the outset.

#### 5. Genetic factors

In recent years, there have been many reports of genes considered to be associated with ASD, but each gene is involved in only a small fraction of ASD patients; therefore, ASD is viewed as a syndrome involving many genes. There are also sporadic cases (10-20%). If a parent or sibling has autism, around 10% of their children will be diagnosed with ASD.<sup>15)</sup> Baron-Cohen, S. et al.<sup>32)</sup> stated that because ASD is a broad label that encompasses a wide range of functional disorders, it is difficult to search for abnormalities in specific genes or neural networks.

Consistent results have shown that the concordance rate for autism is

higher in identical than non-identical twins.<sup>45)</sup>

Vivanti, G. et al.<sup>65)</sup> reported that although patients with ASD and Williams syndrome share a common impairment in social cognition, they show opposite social interests, and that examining the mechanisms of both conditions may clarify the elements and neural networks that make up sociality. Williams syndrome is a rare genetic disorder with symptoms including decreased intelligence and heart disease, caused by deletion of a gene on chromosome 7.

#### 6. Level of social adjustment and quality of life

Taylor, J.L. et al.<sup>59)</sup> stated that, although it varies depending on the severity of the original condition, 2-15% of people with Williams syndrome show social adjustment equivalent to that of healthy people. In a survey of 1,266 people who had received a diagnosis of ASD in childhood and were young adults at the time of the survey,<sup>29)</sup> about one fifth of people did not perform regular daytime activities. Factors such as intellectual ability, school-age circumstances, the kind of support received, and part-time work were identified as having an impact on social life.

The quality of life of 180 autistic adults aged 23-60 years in Wisconsin

and Massachusetts, USA, was studied,<sup>9)</sup> and three groups were identified: a dependence on surroundings group, good mental and physical health group, and an independent living group, with daily living skills, executive functioning, and warm maternal attitudes associated with group differences. A study<sup>38)</sup> conducted in the United Kingdom on a cohort of 370 adults with ASD identified a lower quality of life compared with healthy individuals, and employment was a predictor of a good quality of life. Severity of autistic symptoms and mental health problems predicted a poor quality of life.

Magiati, I. et al.<sup>37)</sup> conducted a systematic review of the outcomes of autism in adults. Twenty-five studies were selected based on the following criteria: at least 10 subjects, mean age at time of outcome survey of at least 16 years, and at least one diagnosis of autism before age 16. Although there were significant differences in outcomes among studies, many showed improvements in social adjustment. Many studies reported that the behavioral problems characteristic of ASD improve with age. The most significant predictor of good outcomes was early acquisition of IQ and language skills in childhood. This has also been pointed out in other studies.<sup>22)</sup>

Farley, M. et al.<sup>17)</sup> surveyed 169 adults (mean age: 35.5 years) diagnosed with

ASD in the general population in the United States, and found that approximately 75% of them had an intellectual disability. A total of 20% of them were independent in many areas of life, but 46% of them required ongoing support in most life areas.

A study of 437 children and adults with a diagnosis of ASD and 300 controls at six research centers in Europe<sup>12)</sup> found a wide range of symptoms, but adults had milder impairments in social and emotional behavior. Adults also exhibited milder symptoms when they had co-occurring ADHD. Both symptoms tended to be more severe in males.

The results are likely to be influenced by how the survey population is set and how the sample is selected from that population, as well as the age of the subjects at the time of the survey, but it has been reported that around 20% of adults with ASD show good social functioning, and that the factors affecting the course of the disorder, such as the co-occurrence of intellectual disability, are common.<sup>30)</sup> While there is a reported tendency for the disorder to reduce with age ( atypical development is observed), measures to prevent secondary psychiatric disorders caused by the demands of independent adult are also considered important.

## II. Difficulties for Adults with ASD -

## From a Neuroscience Perspective -

### 1. "Theory of Mind"

In the mid-1940s, autism was reported independently by Kanner and Asperger,<sup>28)</sup> but at this time psychoanalysis was flourishing, and the "refrigerator mother theory" was popularized, which stated that autism was caused by cold mothers involved in early development, and "holding therapy" was proposed. However, subsequent study of ancestry and family history demonstrated that there was a high degree of genetic determinism, and so support for the psychoanalytic hypothesis weakened.

In the 1990s, the social brain attracted attention, and research on brain networks involved in social cognition and reciprocal communication, such as the 'theory of mind' disorder hypothesis of Baron-Cohen et al.<sup>4)</sup> became popular. The term 'theory of mind' refers to the ability to infer the mental states of others, such as their beliefs, and predict their behavior based on those beliefs. Baron-Cohen et al. gave a false belief task (Sally-Anne task) to a group of autistic children, a group of children with Down syndrome, and a group of typically developing children whose language age (age of language development in the case of typical development) was calculated to be around 4 years by a test of language development, and found that only the

autistic group gave false answers. In this task, it is impossible to answer correctly without understanding how other people think, so it was considered that the children with autism had a problem with the system that understands the theory of mind.

However, it was later discovered that some high-functioning autistic people with high intellectual ability were able to successfully complete the false belief task, and it was also found that almost all autistic people with a verbal mental age of over 11 to 12 years old were able to pass the false belief task.<sup>18)</sup> Furthermore, it has also become clear that the theory of mind alone cannot explain the disorders of autistic people, since passing the theory of mind task does not necessarily improve social behavior or communication.

### 2. Spontaneous prosocial interest

Although the theory of mind task cannot be performed without the acquisition of language, Senju, A. et al.<sup>54)</sup> performed the false belief task, by tracking eye movements with an eye tracker, clarified that while typically developing children are able to predict the behavior of others based on their false beliefs at the age of 18 months to 2 years, this is not seen in children with autism. Furthermore, Senju et al.<sup>53)</sup> demonstrated that individuals with Asperger's syndrome who have

intellectual abilities equivalent to those of typically developing individuals can easily pass the classic false belief task, but do not spontaneously predict the actions of other people. Thus, they have high-level abilities in situations where the structure is clear and what they should do is clearly indicated, but have difficulty in actual interpersonal situations where there is more freedom, and this result is consistent with their real-world abilities. In clinical settings, it is often the case that people with ASD who have been able to live without major problems up until high school then break down when they enter university and are forced to make their own choices. Furthermore, Senju<sup>55)</sup> reports that the difference in the way the theory of mind works between typically developing children and children with autism may be due to differences in the developmental stage.

It is also known that autistic people have difficulty imitating the facial expressions of others and transmitting unconscious actions such as yawning,<sup>52)</sup> and that their ability to empathize through the activity of mirror neurons is reduced. Furthermore, it been shown that spontaneous facial mimicry can occur when people are taught to pay close attention to faces, for example, by having them indicate where the person in the photo is looking or respond to what kind of expression the person is

making.<sup>50)</sup> Since mirror neuron activity is observed in such cases, it cannot be said that the lack of mirror neuron activity is the cause of social dysfunctioning.

### 3. Disorders seen in early development

As mentioned above, even in infants who have not yet developed language, it has become possible to understand how they perceive the outside world using eye trackers and other devices.<sup>16)</sup> By studying infants with older siblings who have been diagnosed with autism (approximately 19% of such children go on to be diagnosed with autism<sup>48)</sup>), it has become possible to study the developmental process before the age at which ASD can be diagnosed. It has been found that while typically developing children show eye tracking and joint attention at 6 to 12 months of age, infants who are diagnosed with autism at a later time do not show these tendencies.<sup>5)</sup> These functions are the basis for learning social cognition, recognizing facial expressions, and understanding others' intentions by sharing the world around them with their mothers and other people. It is also considered that joint attention and social cognition form the basis for integrating information related to the self and that related to others, while simultaneously incorporating them.<sup>66)</sup> These differences become more

apparent before entering elementary school,<sup>68)</sup> and there are reports that such tendencies are also seen in adults.<sup>68)</sup>

One of the well-known behavioral characteristics of ASD is that the person does not make eye contact. At the age of two, they look at the other person's eyes in the same way as typically developing children, but at the age of four, they stop looking at faces as much, and this is considered to be a phenomenon that occurs in the course of atypical development.<sup>13)</sup> However, there are people with ASD who do not avoid eye contact, and it has been reported that it may cause secondary disorders such as social anxiety.<sup>14)</sup> As for facial expression recognition, it is considered that the inability to successfully direct one's gaze is the cause, rather than a disorder per se.<sup>58)</sup>

It is also known that the effect of eye contact is weak from an early stage of development. The effect refers to the impact of receiving a gaze directed at oneself, increasing arousal, judging the intensity of stimulation, and increasing motivation. The effect is recognized within 150 to 170 ms of eye contact stimulation, and is generally perceived from infants to adults.<sup>47)</sup> Furthermore, people with ASD pay more attention to objects than to people, and they have difficulty shifting their attention once it is focused.

There are many reports that these difficulties with attention and eye contact continue into adulthood.<sup>41)</sup> The social cognitive difficulties experienced by adults with ASD are linked to difficulties in inferring the actions and intentions of others, referred to as mentalizing difficulties. It is also known that this can lead to increased social anxiety. Such abilities are more clearly manifested as impairments in the ability to spontaneously and quickly understand the intentions and emotions of others during real-world interactions than in social cognition tests conducted in a laboratory setting.<sup>56)</sup> However, it is considered that there are marked individual differences in the developmental process, and more research is needed.

#### 4. The hypothesis of impaired social motivation

Based on these findings, the hypothesis of impaired social motivation has come to the fore. The striatum-amygdala-orbital network is considered to regulate the intensity of social stimuli and motivate attention to faces and eyes, involving the dopamine system and oxytocin.<sup>57)</sup> Rather than overt behavior, the focus is placed on the activity of the reward system in the brain in response to social stimuli. Multiple hypotheses have been generated, such as the idea that in ASD,

non-social stimuli have a higher reward value, and social stimuli act as a “punishment” rather than reward. In order to diagnose ASD, it is essential to observe both impaired reciprocal interaction and repetitive, restricted behavior. There are two hypotheses regarding the cause of these symptoms: one is that they are caused by impaired brain networks, and the other is that they are indirectly caused by impaired social motivation. These impairments mean that even if people with ASD are trained in how to behave in society, it is difficult for them to apply these skills in the real world.

Bottini, S. et al.<sup>10)</sup> conducted a systematic review of the theory of social motivation disorders. They extracted 27 studies from 2011 to 2017, and as the experimental paradigms, methods of evaluating reward, and types of stimuli used varied from experiment to experiment, the results obtained also included conflicting ones, and no clear conclusion could be reached. Although there is a commonality in that there is some kind of abnormality in the reward system, there is still the possibility that this abnormality varies among people.

Mundy, P. et al.<sup>43)</sup> examined seven hypotheses related to social attention and motivation, and proposed that the mechanisms of social attention and motivation deficits that begin with joint

attention disorder seen soon after birth need to be elucidated.

Vinckier, F. et al.<sup>64)</sup> compared brain activation in 19 adults with ASD and 19 typically developing adults by showing them either human faces or inanimate objects using fMRI. When they were given a task to guess the age and size of a face, there was no significant difference in activation of the dorsolateral prefrontal cortex (considered to play a role in the value system) between the two groups. However, when they were left to respond spontaneously without being given a specific task involving faces, there was a significant decrease in activation in the ASD group.

## 5. Neurocognitive function

In a study<sup>42)</sup> that compared cognitive functions in 64 adults with high-functioning ASD and 53 healthy adults, it was found that people with ASD exhibited poor control functions in auditory tasks, and that their ability to inhibit and flexibility of their attentional functions were related to their limited, repetitive daily behaviors. In particular, the degree of decline in their ability to inhibit their responses to visual information and shift their attention to auditory information was predictive of their stereotyped motor and sensory behaviors.

The systematic review and meta-analysis conducted by Velikonja, T. et al.<sup>63)</sup> covered studies that examined neurocognitive or social cognitive function in people with autism/ASD aged 16 years or older between 1980, when the diagnosis of autism was first included in DSM-III, and 2018. The 75 studies included 3,361 individuals with autism (average age: 32 years) and 5,344 typically developing adults, and the severity of the disorder was ranked as follows: “theory of mind” > emotional recognition and processing > processing speed > language learning and memory. Impairments in attention, vigilance, and working memory were mild. In a meta-analysis by Trevisan, D.A. et al.,<sup>60)</sup> 62 studies showed that facial expression recognition ability was significantly positively correlated with age, language and non-verbal intelligence, “theory of mind,” and adaptive function, and significantly negatively correlated with alexithymia and the severity of ASD symptoms.

From these results, we can conclude that in the absence of mental retardation, the ability to handle things is fairly well-preserved, and because there is a tendency to be more interested in things than people, there may be an aptitude for handling things as a job. In the author's experience, there was a case where a person with problems such as not being able to say

hello to people around her was viewed positively in a company and she was given long-term employment because of her diligent approach to work, accurate data entry, and perseverance. When a person with ADHD who was restless was assigned to the seat next to her, she became irritated and thought about quitting her job. However, she was able to regain her concentration by moving seat and putting up a partition, thanks to consideration from people at her workplace. She looks forward to buying her favorite snacks when she goes home, and she has been attending work without being late or taking any days off. The case study introduced in this paper has been modified to protect the individual, and the author has obtained approval for its publication.

### III. Treatment and Support Methods

#### 1. Pharmacotherapy

In the UK, 29% of people with ASD are given medication, regardless of their age, and the most common types of medication are sleeping pills, psychostimulants, and antipsychotics.<sup>44)</sup> The amount of antidepressants administered increased significantly in the 1990s.<sup>1)</sup>

The National Institute for Health and Care Excellence (NICE) guidance<sup>45)</sup> states that anticonvulsants, antipsychotics, antidepressants, oxytocin, and cognitive enhancers

should not be used to treat the core characteristics of ASD, such as impaired social interaction. In the Cochrane Review,<sup>67)</sup> for comorbid psychiatric disorders, for example, if there are depressive symptoms, antidepressants are administered, but it is noted that there may be peculiar reactions and so caution is required.

Regarding aggressive behavior and excitability, aripiprazole and risperidone are used in the United States, having been approved by the Food and Drug Administration (FDA), but they have not been approved for use in adults in Japan. Depression and anxiety symptoms often occur together, but due to a lack of evidence, drugs that have been proven effective in clinical trials for typical depression are used.

Atypical antipsychotics are used for many behavioral disorders, including self-injurious and emotional behavior. In particular, there are clinical trials showing that 5-HT receptor agonists are effective.<sup>40)</sup> Although there is insufficient evidence, mood stabilizers are used for comorbid bipolar disorder. Lithium is sometimes used when there is a family history of bipolar disorder and symptoms such as hyperactivity and agitation are observed.

A consensus meeting was held by the British Society of Psychopharmacology, and guidelines were published in 2018.<sup>23)</sup> According to these guidelines,

the number of subjects in clinical trials for selective serotonin reuptake inhibitors (SSRIs) is small, and the conclusions are inconsistent. However, the Cochrane Review<sup>67)</sup> states that there is no evidence supporting use in children, but there are data supporting use in adults, being particularly useful for repetitive behaviors. There is no evidence for the use of drugs that act on the glutamate system (such as memantine) or drugs that act on GABA (such as pregnenolone). Oxytocin requires further research into its effects in larger samples. Antipsychotics, especially risperidone and aripiprazole, are used to treat impulsivity, etc., but the target of administration and side effects need to be constantly monitored. For depression in adults with ASD, only fluoxetine has been studied regarding its effectiveness, and it has not been shown to be superior to a placebo. For comorbidities such as anxiety, sleep disorders, irritability, and ADHD, it is recommended to administer medications that have been shown to be effective when used alone, with careful consideration of each individual case.

It is often the case that ASD and ADHD occur together, with a reported co-occurrence rate of 21%.<sup>21)</sup> In light of this, British experts have published a consensus on treatment.<sup>69)</sup> In adults, environmental adjustment and behavioral therapy are prioritized, but

atypical antipsychotics may be used for a short period of time for irritability, etc. All psychotropic drugs are likely to cause side effects and should be used with caution. In addition, central stimulants should be administered with caution to middle-aged and older people with a history of heart disease. It is useful to note visual information when obtaining consent for medication.

Yamasue, H. et al.<sup>20)</sup> reported on the effects of intranasal oxytocin administration in a clinical trial of 106 people with ASD aged 18 to 48. They found that oxytocin was effective in people with ASD who had intellectual disabilities or epilepsy, and that there was also no significant difference in side effects compared with a placebo group. However, there were three cases of seizures in people with epilepsy during or after oxytocin administration. They stated that the impact on daily life should be evaluated.

## 2. Physical therapy other than drug therapy

Because a diagnosis is made based on behavioral characteristics, even if it is known that development is atypical from infancy, it is difficult to diagnose ASD unless the behaviors indicated in the diagnostic criteria manifest themselves around the age of 3 or 4. As mentioned above, since disorders of joint attention and the effects of eye

contact can already be seen from around 6 months of age, there is a possibility that interventions such as neurofeedback will be developed for such infants. However, as there are cases where the disorder does not develop, it is necessary to discuss the ethical framework with family members, experts, and other knowledgeable people, and reach a consensus, in the same way as in high-risk research for schizophrenia.

Ameis, S.H. et al.<sup>2)</sup> randomly assigned 40 people with ASD aged 16 to 35 years who did not have intellectual disabilities to either a repetitive transcranial magnetic stimulation group (20 sessions over a 4-week course, with 20-Hz stimulation applied to the dorsolateral prefrontal cortex) or a sham stimulation group, with the aim of improving executive function. Although there was no significant difference in the improvement of executive function between the two groups, there was a significant improvement in those with low baseline executive function, so it was pointed out that there was a possibility of improvement in the effect being seen in those with more severe disorders.

## 3. Psychosocial treatment

NICE guidance<sup>45)</sup> recommends that behavioral analysis should be conducted for problematic behavior, and that

adjustments should be made to the surrounding environment and responses of family members, and that the use of antipsychotic drugs should be considered. As for interventions with patients, the basic approach is behavioral therapy rather than cognitive intervention, and to aid understanding, information is provided visually, such as using worksheets, the rules are clarified, and the involvement of family and supporters is encouraged.

In a systematic review of psychosocial interventions, Bishop-Fitzpatrick, L. et al.<sup>8)</sup> identified six trials of social cognitive training. They found that there was a certain level of efficacy when social cognition, communication, and social skills were used as outcome measures, but they also stated that there was still insufficient research on the effectiveness of these interventions in terms of the sample size, effect size, etc.

Pallathra, A.A. et al.<sup>49)</sup> conducted a correlation analysis involving 29 adults with ASD who did not have intellectual disabilities, using 16 different assessment scales selected from 7 domains (intellectual functioning, ASD characteristics, social motivation, social anxiety, social cognition, social skills, and community functioning) that are known to be impaired. As a result, significant correlations were noted between social anxiety and ASD

characteristics, social skills and community functioning, and social skills and ASD characteristics. However, the fact that no other correlations were found suggests that there are different types of impairment in social life. It is considered that social motivation may be key to treatment.

The UK Expert Consensus Guidelines<sup>23)</sup> also review treatment methods other than drug therapy, and for children, it is recommended that parents and supporters practice joint attention and two-way communication based on behavior, and that training be provided on how to interact with children. In the case of adult ASD, social skills training (SST) is expected to improve social learning in cases where there is no learning disability, but there is not yet sufficient evidence to support this, and it needs to be implemented as part of a broad range of social learning programs. It is also stated that quality of life can be improved through clearly structured recreational activities. Cognitive behavioral therapy is recommended for anxiety and obsessive-compulsive disorders that co-occur.<sup>23)</sup> Individualized and supported employment is useful for obtaining and retaining work. Attempts to improve communication skills using a combination of keyboarding and sign language are still only reported individually, and there has been

insufficient research on their effectiveness.

The guidelines<sup>23)</sup> state that when supporting people with a combination of ASD and ADHD in school or work, it is not enough to simply extend testing time as a reasonable accommodation; things like allowing breaks during testing must also be considered. They also state that it is important to provide education and information to promote understanding of colleagues. For patients, support that clarifies goals and deadlines is useful. When there is an intellectual disability, it is necessary to pay attention to the explanation and consent regarding support. It is also necessary to provide family members and caregivers with information about care and support for long-term financial issues. Psychological education, peer group experiences, cognitive remediation, and cognitive behavioral therapy are also expected to be effective for both patients and caregivers

ASD is often accompanied by social anxiety, which can further reduce social functioning. Bemmer, E.R. et al.<sup>6)</sup> divided 78 adolescents and young adults with ASD into groups of about 10 and provided 8 weeks of modified cognitive-behavioral therapy targeting social anxiety (social life skills training, anxiety exposure, behavioral experiments, etc.). They noted significant improvements in social

anxiety, social motivation, restricted interests, and repetitive behaviors, although the effect size was small. In addition, the participants were highly satisfied with the program.

Up to this point, we have discussed interventions to improve the social functioning of people with ASD so that it approaches the social functioning of the majority of people in society. However, by making the goal of treatment is the acquisition of conventional sociality, there is a possibility of a gap being fostered between people with ASD and their supporters or guardians. One patient with ASD said: "When I was having a hard time, I got a lot of advice, but it was hard because I couldn't actually put it into practice. It felt like I was being forced to do things. The best thing was talking with other people with disabilities. It is important to think only about yourself. It is better to have the attitude of not listening to what supporters say. It is okay to think that you can stay inside all the time." This person describes the pain of not being able to do things even when encouraged to live a conventional social life, the feeling of being cornered by it, and how valuing one's own way of thinking and living will eventually open a path. This is an important point when considering support for people with ASD, and the

author would like to discuss it in more detail in the section on the social model.

#### 4. Guidelines

NICE published guidance on the diagnosis and care of adults (aged 18 years or older) with ASD in 2012,<sup>45)</sup> and some revisions were made as recently as 2021, so it is probably safe to say that this is the most up-to-date version. The basic policy is to work in partnership with people with ASD, their families and partners, to support them with respect and take the time to build a relationship that is empathic, supportive, and non-judgmental. It also states that support should be provided with consideration for the characteristics of people with ASD. For example, this includes understanding the gap between abilities measured by IQ and actual social adjustment skills, and clearly defining their roles. It encourages people with ASD to participate in self-help groups and individual support. It also recommends that such places should provide sufficient personal space and be sensitive to the colors, brightness, and noise levels of the environment, as well as to ways of obtaining information visually. They also recommend that people with ASD bring a “passport” with them that describes what kind of support they need. For people with ASD without/with only mild learning

disabilities, it is recommended that clear rules be provided for modeling, feedback, and responding to challenging situations so that social learning can occur in groups or, for those who are not comfortable in groups, individually. It is also recommended to provide individually tailored supported employment and learn anger management.

Expert consensus guidance for people with both ASD and ADHD in the UK<sup>69)</sup> stated that, as sexual urges and behavioral manifestations are likely to appear in adolescence, it is necessary to learn about psychoeducation and coping methods, and the risk of developing criminal behavior, along with substance abuse, etc., must be considered.

#### 5. Support for families

Eklund, H. et al.<sup>15)</sup> surveyed 168 young adults (aged 14-24) with developmental disabilities and their parents to determine their needs in daily life, and found that there was a discrepancy between parents and young adults in 21 of 25 areas of daily life, with parents having higher levels of need. When parents are unaware that their child is being bullied at school, or when they demand that their child behave like a “normal child” (e.g., “if you were motivated, you could behave properly”), or when the mother alone takes the blame for the child's poor school

performance, the parents' anxiety, lack of time, and sense of guilt ultimately become a burden for the person with ASD. It is important to support the parents and other relatives who are providing care for the person with ASD, and this is also a direction that is likely to yield results.

#### IV. The Social Model and Reasonable Accommodation

##### 1. The medical and interaction models

Kumagaya<sup>31)</sup> states that “with regard to the existing concept of ASD, it is necessary to reconsider the fact that the concept of communication disorder describes the disability that occurs between the minority and the majority in terms of information exchange and communication styles as if it were an impairment of the minority.” The idea of treating and caring for the impairments of individuals can be seen as the medical model. Furthermore, Kumagaya examines what happens between people with ASD and typically developing people when communication does not go smoothly, and what kind of efforts can be made by both parties to overcome the barriers, in various situations within the framework of research about people with ASD by themselves, and emphasizes that it is not possible to simply lump them all together as those with ASD. This can be thought of as a model of interaction that occurs in

individual situations, and at the same time it is a direction in which both parties overcome barriers tougher through co-production.

##### 2. Social model

The social model is the idea that has driven the development of legislation in recent years to promote the social participation of people with disabilities.

The social model states that: “in order to achieve equality between people with and those without disabilities, it is necessary to flexibly change the norms and rules centered on people without disabilities to suit the situation of each individual person with a disability.”<sup>19)</sup> Furthermore, based on the International Classification of Functioning (ICF) model of life functions<sup>24)</sup> developed by the World Health Organization (WHO), all difficulties encountered in life, such as pregnancy and aging, are considered disabilities, and reasonable accommodation is sought from the environment. For example, holding meetings at work during working hours so that pregnant women can easily attend will also make it easier for those who are raising children or caring for family members. For others, it means more time for themselves and their families after work. Reasonable accommodation that can be provided will vary depending on the

circumstances of the employer. For this reason, the Ministry of Health, Labour, and Welfare and other organizations have published guidelines on their websites, listing examples of reasonable accommodation that many employers can facilitate, and research groups led by employment support organizations and government agencies have also compiled and published examples of good practices. Recently, there have also been reports of attempts to use artificial intelligence to match the desires and abilities of people with disabilities with reasonable accommodations that schools and employers can provide.<sup>25)27)</sup>

When environmental adjustments are made and depression and anxiety treatments are effective, the "developmental disorder-like" characteristics fade, and conversely, when living in crisis or adversity, the "developmental disorder-like" characteristics become more apparent, as is often seen in daily clinical practice.

### 3. Development of the social model into a system

Bunt, D. et al.<sup>11)</sup> conducted a review of employment support policies for people with disabilities, including ASD, in seven European Union member states (including the United Kingdom for the period up to its withdrawal). The background was that only about 10% of people with autism were employed and

77% of those who were not employed wanted to work. Using the keywords "employment," "disability," and "ASD," 219 articles were extracted. The Second World War left many people physically disabled, and at a time when the economy was in a state of collapse, a quota system for the employment of people with disabilities, including those with autism, was introduced in Western European countries. Later, France introduced a law prohibiting discrimination in employment on the basis of disability, replacing the quota system, and this spread to Western Europe in the 1990s. Despite these support systems, there has been no significant improvement in the rate of employing people with ASD, and there is discussion about public employment support systems, vocational training, and subsidies for work experience.

In Japan, legal systems to promote the social participation of people with disabilities have been developed in recent years. In August 2011, the Basic Act for Persons with Disabilities was amended to include provisions prohibiting discrimination on the basis of disability and providing reasonable accommodation. Furthermore, in June 2013, the Act on Employment Promotion, etc., of Persons with Disabilities was revised, and prohibition of discrimination on the basis of disability was established. This

law does not see people with disabilities as objects in need of protection, but rather as subjects with rights.<sup>25)</sup> A young man was good at computers and his hobby was solving mathematical problems. He was able to rely on these skills and lead a healthy life until he entered vocational school. However, after he started work, he did not attend welcome parties, etc., and even if he did not understand his work, he could not ask for advice, etc., and so he was reprimanded by his boss at work. In response, he made a long “excuse,” was reprimanded again, and became depressed. After being diagnosed with a developmental disability at a mental health clinic, and after an interview with the young man by an occupational physician and employment specialist, he was given a job that involved giving instructions using visual information and picking products for shipping on a computer in a warehouse, even though it was not a job that matched his academic background. He found it easier to work alone because he did not have to worry about his surroundings, so he did not feel as stressed. He even made suggestions to his boss about more efficient picking procedures. As he feels uncomfortable in the presence of other people, he has changed his working hours to avoid crowded trains, which has made his work much easier. The whole company is now considering

flexible working hours. His weakness led to a review of placement and employment conditions at the company.

### **Conclusion**

As we have seen, there has been progress in the field of neuroscience in terms of which developmental disorders are associated with ASD. In addition, highly practical and effective support methods, such as parent-child training, are becoming more widespread. However, the author believes that integration of the medical and social models is essential, given that there are still no treatments that significantly improve the social lives of adults with atypical development.<sup>25)</sup> Specifically, people with different personalities should be given due consideration as a matter of course, and efforts should be made to enable each person to lead a life that is easy to live and provides a high level of satisfaction. In the field of employment support, this is already being done with the support of the legal system, and the author also provides cognitive function rehabilitation, discussing people's strengths and weaknesses together, and supporting them in developing workplaces and designing reasonable accommodation practices for companies. The direction of support needs to be in line with the persons' own values, and since they are people who tend to want to withdraw

into their own world, they will not move even if you generally recommend “good things” or “things you want them to do.” Firstly, support them in a way that allows them to demonstrate their interests and abilities, and if they come up with something they want to learn, provide them with SST, for example, and recognize their strengths in completing work consistently and accurately, even if they are not good at interpersonal interaction. Also, see their unique hobbies as a rich way of life. We have seen on a daily basis that they can be very strong at things they are interested in or find rewarding.

People with disabilities, their families, and the medical, welfare, community care, and employment support professionals all have their own unique models and support methods, and belong to different organizations. In order to work as a single team, it is desirable that they understand each other's cultures, share their experiences of success in actual support, and be able to move between each other's fields.

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