

THE ANALYSES OF POSSIBLE INDICATORS OF CHILDREN WITH AUTISM SPECTRUM DISORDERS EARLY DIAGNOSIS

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ABSTRACT

Nowadays autism spectrum disorders (ASD) are on the list of most frequent childish disorders. It is characterized by communicational, behavioural, and emotional difficulties, unique manifestations of cognitive processes, lack of communicational initiative. ASD is a developmental disorder that occurs in early childhood, persists into adulthood, and affects three areas of development: communication, social partnership, and behavior.

So, when the means of communication are incomplete or absent, the normal course of the child's development is being disrupted, social adaptation becomes impossible. For the effective organization of speech therapy intervention of children, it is necessary to start child's rehabilitation work as possible of the child's development:

The author's long time professional experience (15 years) in working with these children indicates that one of the keys to the best effectiveness of communication and speech development is early intervention, which can be organized only after the early detection and diagnosis of children with ASD.

One of the prerequisites for early diagnosis is to ensure the continuity of the awareness process among parents, which is the main goal of our article.

Key words: autism spectrum disorders (ASD), autism, speech therapy, early intervention, indicators of early diagnosis, early diagnosis.

INTRODUCTION

Some warning signs of autism are being observed at the earliest age. It is difficult to reach eye contact with a baby because he/she avoids direct gaze. There is no attachment to the parents, the child does not cry when the mother or father leaves, does not raise his/her hands in their direction, may not like hugs and touches.

A child with autism prefers to play with only one toy and is completely absorbed in that toy. There is a delay in speech development: a 12–16-month-old child does not make any sound, does not repeat short words. Children with autism smile less. Sound or light signals can in some cases have a negative effect due to these children's hypersensitivity. The child does not try to communicate with other children at an early age, shows inappropriate behavior.

Anyway, only the mentioned symptoms cannot prove the existence of autism without professional diagnostic measures (Bayesnskaya, 2007).

The main manifestation of autism in both early and adulthood is interpersonal communication, because people with autism are unable to distinguish the emotions and non-verbal signals of others, so comes the communicational fail. A small child finds it difficult to express his/her feelings towards relatives, avoids playing with others, does not show interest in new people.

Children with autism are partially or completely speechless, they start speaking much later, have limited vocabulary, confuse pronouns and endings, do not understand humour. Echolalia is often observed. These children have unusual gestures, repetitive movements, stereotyped behavior. For example, a child who always walks the same path has difficulty either refusing to deviate from his familiar path or enter a new store. This child can create some ritual and never deviate it (always puts on the right glove, then the left one). Any attempt to deviate from the casual situation can provoke a strong reaction and resistance in these children (Bashina, 1999).

LITERATURE VIEW

In professional and methodological literature, the term “autism” (Greek: autos - self) is used as a mental disorder that implies the development

of a person's verbal, social, behavioural, personal, and communication skills. In general, this disorder is often characterized by a tendency to be detached from reality, to seek solitude, to immerse in the personal inner world, to repeat stereotyped behaviours and to prefer inanimate objects to people, as well as to have complete or partial speech (Freitag, 2007).

“Autism” was first mentioned by Bleuler in 1912 to describe a non-reality-specific mindset based on a person's emotional needs (APP, 2015).

“Childhood autism syndrome” was used as a separate clinical unit by Leo Kanner in 1943, although works and efforts to correct children with such problems have been known since the early 19th century.

Kanner, in particular, was one of the first researchers to view autism as a syndrome, or a set of unique behavioural manifestations. In his research, autism was considered a type of emotional disorder. At the same time, Kanner studied the peculiarities of verbal communication in children with "normal or almost normal" mental abilities and focused on their unusual social and communication disorders. He considered that children with autism were characterized as isolated and closed, with a tendency to make repetitive expressions, interested only in inanimate objects, and intolerant of any change in their agenda. The “complicated” type of early childhood autism was named “Kanners’ autism” or “Kanner’s syndrome” (Oller & Oller, 2009).

The Austrian psychiatrist Asperger (1944) and the Soviet scientist Mnukhin (1947) also dealt with the problems of autism. In particular, in 1947 H. Asperger introduced a milder type of autism spectrum disorder, which was accompanied by a lower level of emotion and intellect. This type of autism was called "Asperger syndrome" (Asperger, 1991).

The results of researchers in the following years showed that the range of autism spectrum disorders is quite wide and different. At the same time, it is noteworthy that the variety of characteristics of general ASD causes that each child with ASD is individual, and therefore it is not necessary that all the characteristics of autism must be seen in the same child. (Kharatyan & Hovyan, 2021). The World Health Organization (WHO) defines ASD as a group of complex brain development disorders that involve difficulties in social communication and interaction, as well as a limited and repetitive range of interests and knowledge (ICD-10).

However, in the May 2013's article in the "DSM5" Diagnostic Manual all specific boundaries of autism were formally merged into one syndrome: Autism Spectrum Disorders (ASD), including Autism, Asperger Syndrome, Childhood Autism, and Developmental pervasive disorder (PDD-NOS) (APP, 2015).

According to the Tenth Revised International Classification of Diseases (ICD), which was approved in Armenia in 2005, autism belongs to a rather diverse group of diseases: General disorders of psychological development, which includes childhood autism (F84.0), Atypical autism (F84.1), Rett Syndrome (F 84.2), Other Disintegrative Disorder (F84.3), Asperger Syndrome (F84.5), etc (ICD-10).

Later, according to the ICD-11 review, the WHO has identified an ASD as a diagnostic unit (code 6A02), in which these disorders are divided by the presence/absence of a person's mental disorder and the ability to use language functionally. In particular, speech, orally or in writing, is viewed as a means of expressing a person's desires and needs.

Often, people with ASD have only some of the symptoms that are qualified as atypical autism, a type of general developmental disorder that differs from early childhood autism at the onset of the disorder (the child's age) or lack of pathological disorders to diagnose childhood autism. Talking about different theoretical approaches to early childhood autism, it can be generalized that early childhood autism is a unique form of psychological development disorder, which is accompanied by several mental dysfunctions, unique emotional, verbal, and sometimes intellectual disorders.

Thus autism has its characteristics, it can also be accompanied by other physical and/or mental problems. Therefore, the presence of some or all of these features makes the diagnosis quite difficult, preventing from discovering the causes of the manifestations of childish autism. Because each person with autism has his/her characteristics, it is quite difficult to perform a diagnostic method that would suit all people with autism (Kharatyan & Hovyan, 2019).

This means that to make a correct diagnosis, field professionals need to be able to clearly and accurately distinguish the wide range of behavioural characteristics of these children through observations, studies, and research.

This reflects child development. As a sample when it is obvious that from the earliest age, the child's play does not develop, there is no plot or role play. A child with autism does not build houses for a doll, the game with cars is limited to back-and-forth (Ivanov, Demyanchuk & Demyanchuk, 2004).

In addition, children with autism can often be hyposensitive/hypersensitive to many stimuli (light, sound). Thus, loud noises often cause anxiety and pain. A similar situation is in the emotional sphere. The child cannot walk barefoot on the grass, which confuses the concepts of cold and hot. Nutritional characteristics in the case of autism also begin in early childhood, when the child, for example, refuses to eat food of a certain colour or prefers only one type of food.

It should be noted that there are no easy, accurate, and obvious methods and indicators, especially at an early age, when the child is just beginning to show his/her features and personal qualities. For early detection and early intervention, a Russian researcher Yeremeev (Yeremeev, 2019) in his works has included the field of comparing the autism-specific features of all areas of normal development in early childhood, which will be mentioned below.

RESULTS AND DISCUSSION

The basis of this research was the analysis of the tables proposed by this author, as the developmental stage is more noticeable from a pedagogical point of view, and our goal is to facilitate the discovery of ASD not only from a medical point of view. Yeremeev compares normal childish development to the developmental characteristics of ASD covering almost all areas of child development: speech, motor, hearing, sight, social behavior and perception, sensory-motor development, play stages (from 3 months to 24 months). Analyzing these fields can be a good basis for effective early diagnosis and intervention of children with ASD.

The tables clearly show the importance of the child's harmonious development, from the sensory-motor sphere, motor skills, perception to the stage-development of play, which during normal development is combined with the formation of communication and speech. At the same time, the inconsistent development of the above-mentioned areas is sharply noticeable in children with ASD. For example, from early childhood, it is noticeable that

the child does not maintain eye contact with the communication partner, which is one of the first steps in the formation of communication. When a one-year-old year child instead of responding actively to the sounds of others doesn't respond even to his name.

By pointing out the norms of social and play behavior typical for normal development, our goal is to find out and to show at what stages a child with ASD has a delay, especially in early childhood, which directly affects the development of his/her speech.

The next field of our study and analysis includes additional information provided by parents based on pathological symptoms to be assessed at the appropriate age. Russian authors Lebedinsky and Bardishevsky researched this direction (Lebedinski & Bardishevsky, 2006), the analysis of which will summarize our research work.

The evasive behavior of children towards mothers, the difficulties of speech perception, which is the basis for expressive speech, the predominance, and persistence of stereotyped movements, the almost lack of imitation skills, which is the main precondition for learning speech, are characteristic of children with ASD. One of the characteristic features of children with ASD is the communicational regression or delay of the child starting from 18 months, even if he/she has had verbal-non-verbal communication skills before.

A detailed study of all mentioned allowed us to analyze from a speech therapy point of view because without knowing the stages of a child's normal development, it is impossible to organize a correct, effective speech therapy intervention.

Our research will enable specialists of the field and parents of children with ASD to notice earlier the pathological manifestations in the child's development. The discovery of the phenomena that hinder the normal development of a child's communication and possible early overcoming is one of the main goals of speech therapy rehabilitation treatment.

At an early age, autism can also be manifested by a lack of independence and life skills, typical aggressive behavior or self-aggression, and unfounded stubbornness. Table 1 shows the manifestations of ASD in a 3-24-month-old child suggested by Yermeev (2019).

Table 1.***Developmental characteristics of a three-month-old baby.***

Normal development	ASD
Motor skills development	
• Is able to lie on his belly for a few minutes, holding his/ her head well • Stretches towards the object, but usually can not catch it	• Is not able to lean firmly on the belly, holds his/her head with difficulty • Temporary movement of the head and shoulders from side to side • Stretching the legs to the belly, kicking in bed • He pulls his mother's hair with stereotypical turns with his index finger • Periodic wave movements of the fingers
Hearing	
• Tilts head towards the sound source	• Ignores the sound source, is not ready to hear and react
Sight	
• Looks carefully at the moving object for a few seconds, sees from a distance of 20-25 cm • Follows hand movements • Observes small objects from a distance of 25-30 cm	• Does not focus the glance • Does not follow movements • Does not fixate on the adult's face • The glance is "empty"
Social behavior and perception	
• Activated when interacting with an adult • Laughs in response to the game • Recognizes the mother • Recognizes recurring situations:	• Tendency to take an embryonic position • Crying is replaced by indifference, weakness • Does not feel comfortable in the

feeding, bathing • Dissatisfied with loneliness • Shouts the vowels	mother's arms
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Considering the Table 1 data, it should be noted that these symptoms are attributed not only to autism and can indicate several other diseases, from central nervous system problems to infectious diseases. In the case of wave movements of the three fingers, the presence of possible epileptic seizures should be ruled out.

In case of mood swings and weakness, it is necessary to examine the gastrointestinal tract and the diet of the breastfeeding mother. Perhaps the most characteristic symptoms of early manifestation of autism (at 3 months) are the lack of visual contact with the mother and resistance to contact, "empty eyes".

Table 2.
Developmental characteristics of a six-month-old baby.

Normal development	ASD
Motor skills development	
• Rotates from the bally to the back and vice versa • Creeps • Sits with minimal support	• No desire to take the toy and use it • Absence of initiatives in any activity • The habit of swinging on the feet and elbows • Repetitive movements
Fine motor skills	
• Holds the bottle • Moves the object from one hand to the other • Catches everything, takes it to the mouth	• Hardly holds the toy • Holding an object in one hand without specific actions
Hearing	

• Distinguishes the direction of the sound source • Tilt the head towards the sound	• Ignores the source of out-of-sight sounds • Hypersensitivity to some sounds
Sight	
• Observes moving objects from a distance of 1m • Follows adult's glance • Follows the movement of a small ball from a distance of up to 3 meters	• Fear of light
Social behavior and perception	
• Activates by seeing his/her mother • Extends the arms when he/she wants a hug • First attempts of imitation • Dissatisfied with loneliness • Happy to see himself/herself in the mirror • Glad to see acquaintances • Eats well from a spoon. Loves playing with paper • Has a positive attitude towards strangers	• Does not distinguish mother • Does not ask for a hug • Does not copy others behavior • Does not distinguish emotionally the family from strangers • May have a fixed gaze on the mother's face, but not on her eyes
Speech	
• Sings using vowels	• The first syllables are missing • Low throat screaming is maintained • Often cries

It should be noted that the above-mentioned symptoms also may indicate other diseases. For example, if a child is unable to hold a toy, this may indicate a slow development of fine motor skills. In the same way, the fear of light can indicate the presence of epileptic seizures.

Besides, according to the US Centers for Disease Control, 7-48% of children with autism are diagnosed with epilepsy (Sorokin & Davidova, 2017).

So, a six-month-old baby with ASD usually has a stereotypical aimless activity, swaying on the knees and elbows, hypersensitivity/indifference to sounds, difficulty recognizing the mother's face, does not reach adults.

Table 3.

Developmental characteristics of a twelve-month-old baby.

Normal development	ASD
Motor skills development	
• Sits on his own • Creeps • Tries to stand or get up from a sitting position • Walks with the help of an adult or on his own • Catches and raises the small ball with the thumb and index finger	• Usually walks only with the help of an adult, avoids walking on his own at home • The gait is robotic, not flexible • Walking and running occur temporarily • Muscle tone is generally low or very high
Hearing	
• Responds to his/her name • Distinguishes the tone of voice • Tilts the head towards the sound source	• Ignores the source of out-of-sight sounds • Does not respond to own name
Sight	
• Compares two different subjects • Follows the movement of a small ball from a distance of more than 3 meters	• Focuses on running water, falling sand • Visual contact is missing or too short

Social behavior and perception	
• Applauses • Eats with own fingers, drinks from a cup looks for a toy • Indicates the subject he/she wants • Observes the speaker's face • Resists, when adults do not understand him/her • Shows joint research attention • Worries when strangers approach familiar adults • Trying to comb, eats with a spoon • Shows interest in simple mechanisms, water, and small objects	• Indifferent towards mother • Touches people like inanimate objects • Shows aggression or indifference towards peers • Does not point to the subject he wants • Does not share emotions, impressions • Wrong use of toys and objects • Not neat
Speech	
• Attempts to imitate sentences • Voice imitation • Says the first simple words: mom, dad • Understands several words and instructions accompanied by gestures	• Inappropriate use of words • Delay incomprehension of the other person's speech • Selective response to words

According to the information in Table 3, it is necessary to single out the most typical symptoms of ASD in a 12-month-old child, such as not responding to his name, hypo/hypersensitivity to sounds. Children with autism often do not respond to sounds, even if they do not have any hearing problems (Lebedinski, 2008).

Lack of sight or short duration is one of the most common characteristics of autistic spectrum disorders in a 12-month-old child. Not using pronouns, speech development delays and the absence of desire to share emotions with an adult is also a signal for the child's parents and professionals.

Table 4.

Developmental characteristics of an eighteen-month-old baby.

Normal development	ASD
Sensory-motor skills development	
• Walks and runs • Stops intentionally throwing toys and taking them to the mouth • Lifts a small object with two fingers with precise movements • Uses a spoon, drinks from a glass on his own • Distinguishes small particles in a picture	• Walks too cautiously or too impulsively • Has stereotypical repetitive behavior • Strikes with a thumb and index fingers on different surfaces • Stable behavior occurs only in a familiar environment • Motor skills development is slow and disproportionate • Avoids light, prefers darkness • Tendencies to smell and lick
Speech development	
• Distinguishes several subjects' names and methods of use • Shows body parts perform simple instructions • Uses more than 20 words	• Speech development is distorted and varying: mutism, echolalia, misuse of words, remembers and repeats rhyming texts • Delayed perception of the other person's speech, but disguises it by combined reactions • Verbal hearing delay
Communicational skills	

• Points to the objects, expecting interest from an adult • Asks for help • Uses gestures and facial expressions	• Does not seek help • Absence or lack of gestures, facial expressions • Memorizes texts without understanding the meaning • Outbursts of painful attachment or ignore of the mother
Social behavior and play	
• Imitates adult's behavior • Likes to sit in the arms of an adult and explore books together • Starts using the potty • Emotionally dependent on adults • Playing with toys is conscious, contains a scenario	• Excessive dependence or total ignore of adults in life skills training • Motor imitation is not developed • Strives for a stable, familiar, and ordinary environment • Stress in an unknown situation • A primitive stereotypical game without scenario and imitation

Despite all these symptoms, the most common features of ASD in 18-month-old children are: activation of stereotyped movements and behavior (spins, shaking hands, jumps), the dominance of peripheral vision, lack of eye contact, manifestations of echolalia: repetition of words; faces, gestures, position changes are not used in communication, or are used unnecessarily; toys and objects are used for non-target purposes, absent; imitation and scenario game.

Table 5.

Developmental characteristics of a twenty-four-month-old baby

Normal development	ASD
Sensory-motor skills development	
• Runs kick the ball • Gets down: climbs the stairs • Tries to catch the ball • Builds a tower consisting of 6-7 parts • Draws with a pencil • Recognizes and points to objects, names them	• Total developmental delay • Frequent regressive behavior • Careless movements or excessive agile movements • Stereotypical actions with objects: hand-to-hand movement, rotation, etc. • Often manifestations of fears in the emotional sphere • Difficulty in concentrating
Speech development	
• Uses more than 50 words • Recognizes and names body parts and common objects • Forms short phrases and sentences	• Sometimes regression of speech development • Stamp words incorrectly constructed words or phrases • Very rarely, normally developed non-verbal communication elements
Communicational skills	

• Seeks help, asks questions about the environment • Recognizes family members on a photo • Uses gestures and facial expressions	• Occasionally, regression of speech development: increase of echolalia, impoverishment of prosody, mispronunciation • Mainly - speech developmental delay or delay in speech communication functions • Lack of non-verbal communication • Does not recognize relatives on the photos
Social behavior and play	
• Plays social-imitation games with toys (makes tea, pours into a cup, entertains the doll) • Sometimes plays a game with a simple scenario • Requires parental attention, emotionally attached to them • Negatively reacts to the rejection of requests • Can demonstrate neatness, partially applies dressing skills	• Fear of peers • Indifference towards other children • Communication with relatives is limited or formal • Often does not respond to his/her name • Does not seek the interest of others in the subject • In some cases, may show tidiness Delays or declines household skills • The desire for independence is weak

The most common symptoms of ASD in Table 5 are many manipulative actions with objects (rotation, hand-to-hand transfer), obvious difficulties in focusing on the details, impaired speech development or speech

communication functions delay, limited and formal communication with relatives not responding to own name.

Let's consider other criteria for early detection of autism (Table 6) based on an age-appropriate assessment of additional information by parents and pathological symptoms.

Table 6.

Age-appropriate assessment of additional information by parents and pathological symptoms

<i>Three-month-old baby</i>	<i>Six-month-old baby</i>	<i>Twelve-month-old baby</i>
• No visual focus • Delay in motor development • Has difficulties with holding the head • Pulls the mother's hair with a thumb and forefinger in stereotypical turns • Periodic wavy movements of the fingers	• Has difficulties with catching the toy • Holding an object in one hand without specific actions • Ignores the sound source that is out of sight • Does not distinguish mother • Does not ask for a hug • Does not seek for imitation • Swings on knees and elbows	• Robotic, not flexible glance • fine motor skills development delay • Focuses on flowing water, falling sand • Does not follow simple instructions • Does not understand the words addressed to him/her • Eye contact is missing or too short • Avoidance or aggression towards peers • Does not point to objects • Does not share emotions with others • Uses inappropriate words
<i>Eighteen-month-old baby</i>		<i>Twenty-four-month-old baby</i>

• Speech development is distorted and varies: mutism, echolalia, misuse of words • Speech development is generally delayed • Deepening stereotypical repetitive behavior - jumps, turns • Strikes with different thumb and forefinger on different surfaces • Stable behavior occurs only in a familiar environment • Motor imitation is not developed • Development of independence and self-care skills is delayed • Remembers and repeats the rhyming word	• Extremely frequent stereotyped activity: hand-to-hand movement, rotation, etc. • The sharp growth of echolalias and agrammatism • Does not seek the interest of others • Regression or delay in speech development • The desire for independence is weakly expressed or absent
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"ARBES" Health Center, where the author has been conducting her professional speech therapy activity for about 15 years, is the first institution of the Republic of Armenia that in 1999 has started working with children with autism, children with ASD, and providing the early intervention.

The child psychiatrist diagnoses the child and directs him/her to the appropriate specialist of the team - a speech therapist, psychologist, special education pedagogue, physical or occupational therapist, according to the primary need of the child. The ultimate goal of early diagnosis and screening of children with ASD is to provide them fundamentally scientific and professional approach that will promote the development of children with ASD and improve the results of professional intervention. Moreover, for children under 2- 3 years old, professional intervention should include developmental methods, therefore, such intervention should take place as soon as possible, based on the study of a detailed individual picture of the child's abilities and difficulties.

Early intervention can have a significant impact on a child's quality of life, leading to lasting, positive, ongoing changes. Such programs have already proven to be effective in reducing or eliminating the main symptoms of autism, as well as helping to improve the child's social, mental communication, and attention skills. The intervention of the ASD problem should be aimed at the child, the family u. environment, uniting all the parties

involved in the problem: relatives, kindergarten, family, all social and medical resources.

Early interventional professional teams should work with the parents of children with ASD to develop comprehensive intervention programs, taking into account the fact that the child develops with age. Programs provided in this context should also consider changes according to the child's maturational needs and capabilities. Considering all mentioned above we made current research on the stages of a child's normal development, their obvious comparison with the features of the ASD.

Early diagnosis of ASD is the key to early intervention, which, according to several studies, and our experience in the field, have a significant impact on the recording of positive "long-term" results in children with ASD.

Appropriate ASD intervention should begin with a detailed study of the child's strengths and needs. A clear diagnosis is made based on systematic observations, surveys, the level of communication, social interaction, behavior, and developmental stage of the child, so it is necessary to have a high level of awareness of specialists and parents about the stage of normal development. For this purpose, we present the analysis of the comparison tables of the Russian researcher.

Speech therapists often collaborate with other professionals to develop a more effective correctional program. Each specialist performs correctional work in his or her area of influence: the speech therapist promotes communication and speech development; the psychologist – behavioural correction: the special pedagogue stimulates the development of the child's mental activity and play, etc.

So, it is obvious, that at each age stage (from 3 months to 24 months) the children with ASD had developmental difficulties in all these areas.

Only with early detection of the problem, team analysis and through collaborative work is it possible to achieve the best possible results.

The mission of our professionals is to understand the world of children with ASD, to develop their communication skills. The purpose of the intervention is to improve the quality of their lives through social changes, speech, or other means of communication and behavioral changes. Therefore, the ultimate goal of specialists is not only to develop the skills of the child but also to improve the quality of life of his family, which, as we have mentioned

many times, is possible only due to a correct approach, which presupposes early organization of complex intervention.

CONCLUSION

In conclusion, the first symptoms of autism appear at the age of three months, so raising awareness of parents and early intervention professionals about these symptoms can significantly improve the life skills, socialization, and quality of life of children with autism or ASD.

One of the prerequisites for early diagnosis and early speech therapy intervention for children with ASD is to ensure the continuity of the awareness process among professionals in the field, which is based on the different researches, including the current one, and is one of the best guarantees to help these children.

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