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Autism spectrum disorder in children - case study analysis

Zaburzenia ze spektrum autyzmu u dzieci - analiza studium przypadku

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Abstract

Autism belongs to the group of global neurological developmental disorders. A disturbance in the emotional and social sphere constitutes its specific symptom, together with lack of

understanding of other people's behavior, as well as communicating with them. Most autistic children isolate themselves from the outside world because of too many stimuli, which cause anxiety, fear or self-aggression. The essence is individual therapy, which generalizes and maintains the acquired knowledge and skills, makes the most of the autistic person's potential, as well as shapes and stimulates psychomotor functions, which are usually reduced by this disorder.

The aim of the work was to present the therapeutic path of a boy at different stages of his physical, motor, emotional, social and intellectual development. The functioning of the child before the therapy and the progress made after 4 years were compared. Thorough analysis shows that early therapy has a positive influence on the emotional and social development of an autistic child.

To improve the functioning of an autistic child, it is necessary to introduce individual therapies, use a special organization of learning, adapt educational needs and forms of stimulation through fun. The reactions of autistic children are usually atypical in terms of behavior, however, they should not be negatively perceived from the perspective of their otherness. Everyone deserves respect and understanding, and thus society should be open to promoting knowledge about autism.

Key words: autism, therapy, autistic child

Introduction

The term autism comes from the Greek *autos* and means *self*. It is a complex and complicated developmental disorder of neurobiological origin, with its onset before the 36th month of life. 'It is a specific form of withdrawal involving the transfer of interests from the outside world to the internal world, usually more or less distorted and disorganized by psychological experiences, which usually absorb the patient so deeply that their contact with the environment is limited or even broken off completely. Therefore, the expression and intentions of their activity may be scarce and partly or completely maladjusted and detached from real needs' [1].

Leo Kanner, an Austrian-American physician, introduced a definition of *infant autism*, which had not previously been analyzed as a separate clinical unit. Autism means

an interiorizing onself in one's own world, a lack of emotional bonds. In his study, Kanner draws attention to two axial symptoms of autism: autistic isolation and the compulsion for environmental stability. Kanner mentions 'inability to interact socially, stereotypical repetitive activities, lack of speech or non-communicative speech, lack of imagination, delay in language development, inversion of pronouns, echolalia, and easy mechanical memory among other symptoms' [2].

Autistic person's brain processes received information differently, therefore the reaction to various stimuli is intense, or on the contrary weakened, which is hard to comprehend by properly functioning people. Boys are four times more likely to suffer this dysfunction than girls. Physically, no changes are observed in children in comparison to peers. However, there is different physiological behavior which is far from normal.

Autism is classified according to the types of disorders that occur in a given person. In terms of mental health, these gradations are divided into:

• DSM-V classification issued by the American Psychiatric Association,

• ICD classification issued by the World Health Organization (WHO).

The diagnosed child must meet at least 6 manifestations of abnormality according to Polish requirements, to determine the general *spectrum of autism* and assign it to the appropriate criterion. Irregularities related to verbal and non-verbal communication, contact with peers, stereotypical behavior patterns or age-inadequate development of interests are taken into account.

The dominant causes of autism spectrum are:

• genetic, neurological, and neurochemical factors and the history of autism in the family,

• pregnancy complications and perinatal injuries,

• metabolic disorders and gastrointestinal infections,

• neurobiological and neuropsychological factors [3].

Developmental characteristics of a child diagnosed with autism

Disorders that appear in autistic children are usually noticed in contacts with adults and other children. Autist is characterized by lack of emotional attachment, even to parents, lack of physical and visual contact, inadequate behavior, avoidance of contact with people and thus closing in their own autistic world. 'Children with developmental disabilities participate less actively in the interaction than their peers who are developing properly. They do not often initiate contacts, they also rarely accept the partners' proposal

and interact with them (...) they are less likely to smile, they look at them and approach them, but more often they show negative emotions' [4].

Social development in children affected by the autism spectrum varies. A distinctive feature is lack of interest in friends and playing with them. These children are also unable to imitate the other person, they rarely smile, read gestures or facial expressions incorrectly. Communication through speech is clearly delayed. Usually no babbling occurs during infancy. If the child begins to communicate verbally, they utter the words not understanding their meaning. The main disorders co-occurring in communication are echolalia, perseveration or inversion of pronouns. Neurological dysfunctions such as stiffness in behavior and interests in many people with autism are very severe. They may appear in different areas and change over time. 'These include, among others, preoccupation with certain objects, insisting on following rituals and patterns, movement stereotypes and many others' [5].

Concentration is the biggest problem in cognitive development. It is a difficulty appearing while shifting attention from one stimulus to another. A significant problem for a child with autism is to create a mutual view with another person on a given point or object. This is usually called 'mind theory deficit', which means innate cognitive impairment.

Motor development or awkwardness occur in more than half of the children with the autism spectrum. Compared to disorders of other functions in autistic people, this development seems to be good. However, one can notice 'fluttering' of hands or specific movement stereotypes. The level of fun activity is increasing with the age of the dysfunctional child. The specificity of the play itself differs from the desired behavior. Autists often place items side by side, in line, or separate individual colors. They can be fascinated by flowing tap water, treating it as fun or arranging blocks according to one pattern. The dynamics of development and intelligence depend on individual possibilities. Mental retardation accounts for 75% of children with autism. In contrast, among about 5-15% of all autistics, there are gifted individuals with an above average IQ.

The aim of the study

The aim of the work is to present a therapy path for an autistic boy at various stages of his physical, motor, emotional, social and intellectual development. The study compares the functioning of the child before therapy with the progress made after 4 years.

Description of the examined person

The boy was born on time, in 40 week, from the first pregnancy, in induced delivery. The whole pregnancy went without complications. He received 9 points on the Apgar scale right after birth - 1 point was deducted for skin coloring. On the fifth day of life, the boy received 10 points on the Apgar scale. Due to the high birth weight - 4.070 kg, the child had perinatal complications. The boy was born with parietal periosteal hematoma, transient respiratory disorders, skin ecchymosis, elevated bilirubin level and thymus shadow. He stayed in hospital for 8 days, during which he underwent phototherapy to minimize hyperbilirubinemia. The maximum bilirubin concentration was 19mg%. After leaving the hospital, the child was under constant care of a pediatrician.

Disturbing developmental symptoms were noticed after the boy was 9 months old, because he could not maintain his position while sitting. Two weeks later, after medical consultations, the child began to sit up and walk at the age of 14 months. At less than 2 years of age, he couldn't speak, he often got irritated if something went wrong. He could not play; all the toys were usually scattered around the house, he did not focus on building blocks or playing with cars. He often took a power extension cord and anything that had plugs, e.g. a hair-dryer, a mixer, a hair-straightener, a toaster. When he did not receive these things, he threw himself on the floor, banging his head against it several times, screaming and crying. The boy did not respond to his name and often ran away during walks. The child also showed no social interest among peers. The boy could not play with children, on the contrary - he showed aggression towards them. He reacted quite specifically to the sound of a vacuum cleaner or a kettle turned on, screaming or blocking his ears. However, he was able to communicate using gestures. If he wanted something else, he took his mother’s hand and pointed to something with his finger. While shopping, he was able to lie on the floor for several minutes, shouting, kicking or biting. After all these disturbing symptoms, the mother took the child to the paediatrician. The doctor referred the boy for consultation to a pediatric neurologist specialist, where the first diagnosis of autism was made. The specialist psychiatrist gave the same opinion.

At present, the child is 7 years old. He attends the first grade of the integration class of Primary School No. 65 in Bydgoszcz. He was issued a medical certificate of special education due to the diagnosis of atypical autism. Previously, the boy attended the First Non-Public Kindergarten for Autistic Children in Bydgoszcz, where he was given an early development support.

The influence of applied therapies on the child's physical and motor development

From the very beginning of his therapy, the boy had classes mainly with the use of the cognitive-behavioral method, which improves the functioning of the autistic child in the cognitive sphere, behavior and social contacts. Behavioral therapy is based on operant conditioning, the goals of which are: increasing the scope of behavior that is deficit, reducing undesirable behavior, generalizing and maintaining the effects of therapy' [6]. The aim of the work done was to motivate the boy to work at the table, when initially the main role was played by time, where the task was to withstand a long time in a sitting position. The therapists devoted about a month to this activity to achieve the first results of a one-or-two-minute period of interest in a given exercise by the child.

When the child was in a bad mood or upset, he had a designated place in his room (a bean sack filled with polystyrene), where he could get angry and wind down. He was guided by the therapist to calm down, he was informed that soon after calming down he would be cuddled, his back stroked and would be shown affection. This method also allowed physical contact with the child in a safe way because the boy did not like being hugged.

The boy was taught basic elements of functioning in the society, e.g. washing his hands, dealing with physiological needs, eating with a fork or spoon, dressing, putting on shoes, buttoning, zipping, using Velcro or walking being held by the hand.

The requirements and the number of therapeutic tasks have been carefully increased to arouse interest, willingness to act and reduce the undesirable behavior. Many different therapeutic methods have been implemented to improve the child's mental and physical coordination:

- Behavioral therapy,
- Cognitive skills development training,
- Token therapy,
- Speech therapy,
- Sherborne Developmental Movement,
- Knill's Method,
- Art therapy,
- Kynotherapy,
- Pet Therapy
- Hippotherapy

• Sensory Integration Therapy (SI),
• Johansen Auditory Training,
• Music Therapy,
• Clay therapy - ceramics,
• Pool improvement therapy,
• Corrective gymnastics,
• Eurhythmics,
• Hand therapy,
• Eating training,
• Hydrotherapy,
• Rehabilitation classes,
• Social skills training,
• Revalidation.

The therapists systematically controlled the activities performed by the boy. They were based on simple and familiar activities tailored to the boy's needs and abilities, the progress of which was watched closely. In individual work, the teachers showed a lot of patience, because the boy usually wanted to perform several tasks at once or switched to another activity, so it was necessary to use individual therapy, special organization of learning, educational needs, and forms of stimulation to improve the child's functioning. Due to the state of health and family situation, it was necessary to provide the child with special care services of 10 hours per week. That therapy was aimed at:

- improving communication,
- developing eye-hand coordination,
- improving the manual and cognitive sphere,
- developing passive and active speech,
- supporting emotional development,
- supporting the ability to understand social principles and norms,
- developing and shaping the perceptive - motor function,
- developing orientation in body and surroundings schema,
- shaping graphomotorics,
- shaping school readiness,
- reducing undesirable behavior,

- creating conditions for multilateral activity,
- achieving independence in self-service activities.

Photo 1. Boy aged 5 years during integration with peers

Source: Own archive

In addition to special care services, the boy was also subjected to cognitive therapy, focused on improving cognitive processes, learning about the environment and society, as well as developing the visual coordination while performing tasks in classes. The therapists conducted sessions improving his pronunciation through breathing, articulation, orthophone and sound-reproducing exercises. They developed the child's lexis by means of listening to words and pointing to corresponding objects, theme pictures, features or actions. During the cognitive therapy, the child eagerly listened to stories and fairy tales with a simple moral, which developed his speech and logical thinking.

Systematic participation in speech therapy classes was necessary, due to a lisp, reduced muscle tone in the face and articulatory organs, and disturbed exhalation phase. Initially, pictograms were used, but the boy functioned well enough to shape his mouth to make an utterance, although the effects were slight. In a sense, he was used to non-verbal communication and it was easier for him to communicate this way. During the class, the child matched letters and words to objects and individual letters to a word, because his memory was really excellent. He was subjected to fine motor skills exercises by writing letter-like forms, letters and numbers in a continuous and intermittent pattern. Currently, the boy has a speech defect. He incorrectly realizes the sounds of three rows: humming, sibilant and silent. The boy still requires intensive exercises and therefore participation in speech therapy.

An important reinforcement for the child was the work with stickers. A token board was also created especially for him; the idea was to acquire *smiling faces* for desirable behavior, e.g. walking being held by the hand. For deficit behavior, the boy was given *sad faces*. Depending on the number of positive faces accumulated per day, the child received a prize. The prizes were printed in the form of pictograms, so the boy could choose the desired thing.

In case of individual therapy of the child, exercises shaping his orientation in the body schema, improving the development of motor skills and spatial orientation are important.

Photo 2. Sherborne Developmental Method classes

Source: Own archive

The essence of using the Sherborne Developmental Method is to feel, indicate and name particular parts of body, to shape body parts, and most importantly, to cross the body axis and indicate directions from the axis of one's body up, down, forward, backward, and sideways, which the child has developed below the average. The therapists during classes with the boy develop gross motor skills through physical and dexterity games using a ball, a pouch or an animation scarf, walking along a designated route, e.g. by using a rope, walking around obstacles or playing with a scarf to develop mobility and physical activity. The child has postural problems in motor planning. The boy stumbles along a straight path, falls over, bumps against obstacles and people in the vicinity. The child attends corrective gymnastics classes and is subjected to the Knill's method in the therapy. He willingly undertakes actions supporting his development; he is physically active, however his movements are not coordinated. He has difficulty learning physical tasks, especially complex ones, and performs them with little precision. It is also difficult for him to perform self-service activities, e.g. wiping himself with a towel, therefore it is necessary to continue with the movement therapies.

Undoubtedly, hand therapy, or art therapy influence the child's physical and motor development. The boy attending these classes is extremely enthusiastic about it. These exercises develop visual-motor coordination, improve the manual sphere and the precision of hand and finger movements. They make it easier to master the correct hand grip, develop correct hand movements, strengthen muscle tone, and also teach the directions of painting, drawing and techniques of combining different materials.

Figure 3. Art therapy – Ebru, He art of painting on water
Source: Own archive

The child is often distracted by irrelevant sounds, such as street noise from the outside, the swoosh of trees, a moving car. On the other hand, the problem is his lack of response to commands or a delayed response. Quite often, he is disturbed by noise, loud music, the sound of a vacuum cleaner or a kettle switched on. He reacts by plugging his ears. He also finds it difficult to concentrate. Hence the use of music therapy and individual hearing stimulation by Dr. K. Johannes IAS. The Johannes Method was adapted to the boy individually. Specially for his needs, a CD package was created with recordings of 5-6 songs.

Every day, at the most optimal time for the child, when he was relaxed and calm, he listened to 1 assigned song, which lasted about 10 minutes. This therapy lasted from Monday to Sunday throughout the week. The child could play or draw at that time. He could not watch TV or play because of the lack of focus during the therapy. Auditory therapy improves not only auditory processing, but also: the ability to maintain attention and focus on oral utterances, reading, understanding speech, articulation, communication, self-esteem; it harmonizes muscle tone which affects the body posture, balance, coordination of movements, motor skills'[7].

Photo 4. Boy aged 5 during hearing stimulation with the Johannes Method

Source: Own archive

The boy has sensory modulation disorders in the form of sensory subsensitivity, which is why hippotherapy is used as a supporting therapy. Hippotherapy is a rehabilitation method in which the horse is used as a co-therapist. It is a method that perfectly complements standard rehabilitation. The variety of horse's interactions during hippotherapy allows at the same time to improve the patient physically and intellectually, as well as positively influence his mental condition' [8].

At the beginning of each class, rules how to behave around the horse and while riding are set. During the therapy, play on the horse is conducted, namely: hanging a rubber ring on the horse's ear, riding backwards, combing the horse's mane. The child learns to approach the horse calmly, put on the saddle pad, mount the horse, not to approach the horse from behind, as well as how to feed and groom the animal.

Photo 5. Horse hoof care during hippotherapy class

Source: Own archive

Thanks to hippotherapy, as well as dogtherapy, the boy made significant progress - he became more open to the world around him, understood the concept of feelings of both people and animals, and was more eager to hug others. He gladly participates in classes with animals, is more empathic and caring, and tries to take care of the animal as best he

can. Classes with animals calm the boy down, improve his concentration and social functioning. This therapy takes the child through multidirectional, intensive and systematic psychological and pedagogical work focused on developing deficit spheres. The child is willing to play and reward the animal.

The child has sensory modulation disorders that affect the regulation of the nervous system responsible for the proper course of stimulation processes and restraining oneself. Sensory integration (SI) is necessary for proper sensory processing. The goal of autistic child sensory integration therapy is to improve the processing of sensory stimuli so that more of them undergo effective registration and modulation, and to encourage the child to develop simple adaptive responses so that they can organize their own behavior [9].

Photo 6. Sensory integration classes at the age of 5

Source: Own archive

The boy regularly attends hydrotherapy, which helps proper development of muscle tone. These are classes at the pool, which are designed to reduce muscle tone, minimize undesirable behavior or deficit emotions. The boy attends classes regularly, once a week. Initially, he was afraid to enter the water. The therapists introduced the child gradually so that he could feel fully secure. The idea of the work is to imitate the exercises presented by the class supervisor, use water toys, as well as undergo massage. Currently, the boy is fascinated with hydrotherapy classes and is eager to get ready for the classes, packing the necessary things himself, such as a cap, towel, swimming trunks and flip flops.

Photo 7. Hydrotherapy classes

Source: own archive

The essence of any therapy is to achieve progress in the functioning and development of the child. Outbursts of anger are very typical for the boy; he also manifests aggression towards his peers. In order to eliminate unwanted behavior, the boy participates in Social Skills Training classes. The goal of this therapy is to shape current behavior and show the child progressive behavior. During classes, the boy learns how to identify his own emotions and show empathy. Social Skills Training aims to explain the child the norms and principles obligatory in social life, provide information on how to behave in specific situations, enable contact with other children, create conditions for joint play with them, teach the child to properly respond to anger, sadness and negative emotions, set and enforce friendly norms and social principles, arouse faith in one's own strengths and possibilities, embolden the boy and raise his self-esteem.

Due to the limited nutrition repertoire, the boy also required support in the form of eating training. This therapy helps the boy to combat problems of sensory differentiation in the mouth, which negatively affect the reception of taste and consistency, as well as the smell and warmth of a meal. Food selectivity is usually caused by the boy's mood. He tolerates food of smooth consistency. His gag reflex is caused by unprocessed products, such as yogurt or juice with fruit pulp. According to the recommendations issued by the psychological and pedagogical counseling center, due to difficulties in eating, one should:

• pay attention to the influence of new food / dish exposure,

• follow the rule of fun activity, e.g. playing with toys imitating food strengthens disliked activities,

• do not impose your own taste preferences on the child,

• attempt to expand the food repertoire by sensory stimulation of the oral sphere and olfactory stimulation,

• perform oral-facial massages taking into account current responses and the possibilities of the child,
• provide a variety of sensory experiences with food, such as: cooking meals together,
• give a new product together with the one that the child is familiar with and accepts well

The table below presents the influence of the applied therapies on the boy's physical and motor development.

Table 1. Comparison of difficulties before the start of the therapy and its progress over a 4-year period

	Initial difficulties	Progress made
Self-service	- he doesn't care about his things and doesn't keep them in order, - when he washes his hands or fills a cup with water, he is fascinated by the flowing tap water, he can stare at it for a long time, he rebels when mother wants to turn off the tap, - he doesn't eat many dishes (he doesn't like specific flavors nor consistency), he doesn't eat vegetables, he provokes vomiting while drinking vegetable juices.	- supported by an adult, he starts washing his hands by himself and uses the toilet, - he eats on his own, - sometimes he eats the same vegetable several times; this way he collects points / tickets
Physical and motor development	- imbalance; he does not like to use playground equipment, - improperly performs even the simplest tasks on flat feet, - it is a problem for him to remember the correct starting position for specific exercises, - he cannot focus on the exercise, - very weak eye contact.	- when encouraged, he can perform simple movement improvisations, - in the system '1 exercise repeated throughout the week', Boy remembers it, and correctly and patiently repeats it about 6-7 times, - eye contact occurs quite often, but only temporarily
Manual dexterity	- he often uses only one crayon, - does not stay inside the lines, and goes beyond them,	- he colors well, using many colors and heeds the lines, - with the help of an adult he

	- uses inadequately too much glue, - he is not good at building a tower from large blocks.	cuts quite well with scissors, - arranges complex buildings, cars etc. with small Lego blocks precisely and with great imagination.
Social and emotional development	- he rarely adheres to certain rules, requires constant reminders, - he can't focus on a longer speech, - in a peer group, boy is distracted by everything, - he often interrupts while others are speaking, presenting his comments completely off topic, - he comments on the statements of others, especially children, - he does not establish good relations with other children; he cannot play with them, he does not listen to what they say, - he is aggressive when he is not understood, he often behaves inadequately to the situation, - he can't lose, he wants to be everywhere first	- he reacts correctly to successes and praise, - he can analyze his mishaps in a quiet conversation, he draws conclusions, but he cannot implement them, - he still interrupts other people speaking, - he is still aggressive towards children and adults when something is not right for him.
Speech and thinking	- he cannot compose a picture story, - the ability to focus is very short, - he does not respond to commands and calling him by name, - despite an exhausting conversation, he returns to the same topic after about 10-15 minutes, - new stimuli and sounds from the outside distract him.	- has a very wide range of vocabulary, - knows all the letters, - begins to read quite fluently syllable by syllable, - usually responds to his name for the second or third time.

Emotional and social development of the child

The emotional and social development was presented in the Table above, divided according to the age, in categories referring to the chids's environment.

Table 2. Comparative characteristics of emotional and social development

Range of contacts	Around 2 years of age	Around 7 years of age
Family	- No emotional deviations were noted during infancy. - The first symptoms of irregularities were noticed by mother when the child was about 18 months old. - The boy was restless, often irritated, showed negative emotions in relations with his immediate family, and thus led to physical violence towards himself and third parties	- The boy sometimes gets irritated in situations when he imposes his own opinion and it is not implemented. If something goes wrong, he gets angry, often growls and screams. - Does not show self-aggression. - He can hurt verbally on purpose, but giving it a second thought, he comes over and apologizes.
Peers	- Relationships with other children were limited. - The boy was not happy while playing with peers, he was not involved in relationships with them. Almost always, the relations ended up with tugging at toys or hitting the other child with what was at hand.	- He likes and wants to be among his peers, unfortunately he is not popular and often ridiculed in the environment. - Although he is very empathic, helpful, he can even share toys or treats, there are still situations in which he reacts aggressively. - Because of scratches, bruises or bites, as well as insistent imposing his own opinion, children are skeptical about him.
Adults	The boy has never treated adults with reserve. Communicating non-verbally, he was able to establish relationships with adults and be taken anywhere. - While rebelling, he could attack an adult by biting, kicking scratching, or pinching.	- The child is still unaware that some people may be bad. - He eagerly talks to strangers, e.g. on the bus. He is open and communicative. - He usually talks about negative issues, not realizing what he should not say to strangers.
Occuring emotions	- In early childhood, negative emotions prevailed. - He was consistently guided to agreement, because he was irritated even by trivial	- He is not self-aggressive. - He can listen, although usually incorrectly processes information, which causes anger to built up, and

	things. - When he got what he wanted, he calmed down. Otherwise, it was overflown with strong rebellion, interspersed with aggression and self aggression, shouting, stomping and crying.	sometimes aggression towards others. Usually, the information is again explained to the child so that he understands the purpose, even after adverse events. After thinking it over, he presents his opinion more calmly.
Emotional awareness	- It was extremely difficult for the child to present his emotions. - He would laugh inadequately in situations that did not require it, and a moment later he was chagrined. He was tormented by emotions, from positive to negative.	- He can adept his behavior to different situations. - Sometimes, he doesn't understand sarcasm.

Summary

Owing to the effort, work, patience, understanding, hope and faith, the fears of the child's future and adulthood diminish, but do not completely disappear. 'Kanner and Asperger noticed that autism is not a progressive disease. Asperger emphasized that he observed improvement in his patients' adaptation and compensation, unlike in adults' psychoses, when the patient's condition gradually deteriorated. He was so convinced about it that he eventually depicted a quite optimistic picture of autistic children development. Many parents point out that this does not correspond to their own experiences and that their children find jobs far below their capabilities in adulthood, even despite very good academic performance. Asperger's optimistic point of view undoubtedly resulted from his belief in the power of education and the ability to compensate for problems that he himself considered permanent. Autism does not disappear with age, but Asperger's belief that gifted people can live a successful life despite their autism has proved right'.

To improve the functioning of an autistic child, it is necessary to implement individual therapies, organize learning in a special way, adapt educational needs and forms of stimulation through play. The reaction of such children is usually atypical in terms of behavior, however, they should not be negatively perceived from the perspective of their otherness. Everyone deserves respect and understanding, and thus society should be open to promoting knowledge about autism.

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