

Features of sensory development in children with autism spectrum disorders

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Abstract:

Researchers studying autistic spectrum disorders symptomology agree on the fact that the behavioral manifestations of autism are a response to an organic substrate of their brains. In fact, autism is a complex developmental syndrome, including a heterogeneous group of individuals with similar symptoms, but with multiple biological etiologies (Secară, 2007).

Today autism is described as a pervasive developmental disorder, affected individuals manifesting deficits in the social interactions (using nonverbal behavior in communication, reciprocal social/ emotional), verbal and nonverbal communication and a narrow field and stereotyped interests and activities (American Psychiatric Association, 1994; Myles, Cooper Swanson, Holverstott, Moore Duncan, 2007).

Key words: autism, sensory integration, sensory disorders, intervention, interhuman relationships,

Educational interventions in autism have developed, the most effective being non-biological interventions. There are research reports in the specialized literature promising results and data (Lovaas says an intervention program of 40 hours/week would "heal") but this has been criticized. Children with autism are unable to decipher social intentions, a processing problem that will accompany them throughout life. As a result, they have difficulty relating with others and with the environment. Also, it is very difficult for them to understand a situation from the viewpoint of others. Inappropriate behavior, repetitive and ritualistic, such as dismantling and construction of objects (Albano, 2005), rotating objects (Jamieson, 2004), repetitions of movements of the hands, fingers, arms, hitting his head, walking back and forth (Albano, 2005), body rocking back and forth once can stand on all fours, endless series of jumps on the mat or rotation around its axis (Muresan, 2004) are common characteristics of children with autism.

The direct involvement of the parents or family members in therapy is essential, especially as regards the consistency of the application of intervention plans and the management of disruptive behaviors. Family does not only transfer information which is vital for cognitive or affective autonomy and functionality but also information on social statuses, beliefs and values that guide parents` and children`s behaviour. Shaping has an important role in the transfer process. Children, as observers of adult behaviour will include in their relationships similar behaviour to the one they imitate from their parents. Imitation refers to sets of values taken up by parents, to the manner they try to transfer these values to children through various activities and also to the manner parents themselves behave in this system of values. (Roman, Castanheira, 2015).

Children with autism may show hypersensitivity to sounds, touch, smells and visual stimuli, a condition caused by dysfunctional sensory integration. Sensory integration helps the brain to organize sensory inputs to be used to focus on the relevant sensations, to eliminate the irrelevant and organize sensations so that the person could interact effectively with the environment. Sensory integration deficit occurs when the brain does not process or organizes range of sensory stimuli in a manner that gives children accurate information about the world that exists around them.

Sensory integration refers to the way the nervous system receives messages from the senses and turns them into appropriate behavioral and motor responses. All information received from the environment pass through our sensory systems. Because many sensory processes occurring within the subconscious nervous system, usually we are not aware of them. On the other hand, we are aware of senses involving taste, smell, sound, but most of us do not realize that our nervous system processes ("feel") touch, movement, gravity and body position. As eyes detect visual information and send them to the brain for interpretation, so all sensory systems have receptors that take information to be perceived by the brain.

In conclusion, sensory integration (SI) is the process of receiving, organizing and interpreting information that are based on motor planning, learning and behavior. When this process is disorganized, we talk about sensory integration dysfunction.

Sensory integration dysfunction occurs when sensory signals can not organize appropriate responses. Jean Ayres likened the sensory integration dysfunction to a 'traffic jam', meaning the inability to process and use information received from the senses to have a normal activity in everyday life. Children with sensory integration dysfunction struggle to control emotions and behavior and motor skills in response to sensory stimulation. Sensory stimulation may include touch, sight, sound, taste, smell, feeling of movement

in space and awareness of body position in space. A person with sensory integration dysfunction find it difficult to process and act upon information received through the senses, which creates problems in performing countless everyday tasks.

Clumsiness, behavioral problems, anxiety, depression, school failure and other effects may result if the disorder is not treated effectively. These children have difficulty to keep calm, to activate their alarm state or to have a positive emotional mood.

Children who have difficulty adjusting and processing of sensory stimuli have the following symptoms:

Sensory modulation problems refers to the way a child adjusts his reactions to various sensations (these children are hyperreactive, subreactive in search of sensations or oscillating).

Sensory discrimination issues (how a child hardly distinguish a feeling of another).

Based sensory motor problems (unusual postures, difficulty conceiving action, to plan and organize the movement of the body and to carry out the plan itself).

Associated behavioral and adjustment problems refers to problems that can cause inefficient sensory processing.

Autism, hipercomplexed developmental disorder of neurological origin affects motor and sensory systems, language and verbal communication acquisitions and social skills. Children diagnosed with autism have poor control of impulses and certain behavioral characteristics. Available medical treatments can treat only some aspects of neurological disorder. Every child with autism presents a unique set of traits spectrum disease event, so no treatment is equally effective for all autistic children or to treat all aspects of the disorder. In this condition, the treatment is complex, individualized and tailored for each behavioral profile of each patient. Behavioral analysis (BA), speech therapy, sensory integration therapy, exercising motor skills, playing and socializing with children of the same age are ways to approach treatment program for autism.

Children with autism are described as being absorbed by themselves or by a different world, characterized by poor responsiveness of everything that surrounds them and by a language delay (Baron-Cohen, 2005; Baron-Cohen, Bolton, 1993; Lovaas, 1985, 1986). Often, these children do not accept the changes, their families have difficulty in getting out in public places. Children with autism may develop aggressive behaviors (hetero and self-harm), can turn to self-stimulating behaviors requiring intervention to be quiet (Schechtman, 2007; Lovaas, 1987).

If onset is early, toward the 4th – 8th month of life is noticed in these children the lack of anticipatory movements when they are hugged and lack of feedback to their mother' s smile (Barbuți, Giurgiu, 2004). The autistic child does not know how to analyze submitted information coming from the upper face. The eyes and eyebrows are not carriers of messages for him, on the contrary, they provoke an extreme emotion, unbearable (Muresan, 2004; Baron-Cohen si Belmonte, 2005).

Apparently, sensorial autistic child seems normal; its sensory receptors (five senses) are intact. But his behaviors make you think that there is a deficit of sensory processing.

Authors like, Hermelin and O'Connor (1970) showed that in the presented photographs autistic children preferentially looked at the fund to the detriment of the figures (actually done by normal children). Bullinger (1989) reported a series of abnormal perceptual abilities of autistic children, saying that they use, in a privileged way, the peripheral properties of their visual system to the detriment of the foveal (Muresan, 2004; Stone, 2004). Children with autism may exhibit unusual reactions to physical sensations such as tactile hypersensitivity or painful hypersensitivity (for example, may hit seriously without having any reaction).

Also, children with autism may exhibit impaired proprioceptive integration, this can be seen in children who seem to be 'prevented' , but intentionally colliding other children. Also in daily activities, seems to be 'stunned' ', they are not able to retain order, it is difficult for them to learn letters and various sizes of writing. Show a weak coordination of their own movements and a weak dosage of strength (have difficulty when it comes to stop their own spontaneous movements: can not observe when colored contours) they hardly self-rebalance. They are clumsy, making activities in a slow and inefficient manner (Secara, 2007; Layartigues, Lemonnier, 2005; Schopler, Lansing, Waters, 1993).

Hypersensitivity or hyposensitivity can touch all five senses (Juhel, 1997; Secara, 2007; Fouse and Wheeler, 1997; Preda, 2005). To some autistic children only feel will be affected, and they have different manifestations. It is therefore not possible to establish a general rule for all autistic children. Only autistic children are able to determine with certainty whether they are hyper or hyposensitive to the same stimuli.

In most cases of children with autism, the fine and the rough motion development is poor. Since the development of motion plays an important role in exploring the environment, in motor interactions, physical activity, skill development based tool (handwriting), it is preferable to include physical therapy treatment programs (Muraru-Cernomazu, 2004; Secara, 2007; Layartigues, Lemonnier, 2005; Preda, 2008).

For children with autism, the difficulties in the field of motion are observable since the age of 4-6 months; difficulties rolling from back to belly, difficulty to maintain control of the body in a sitting position, postural asymmetry, flaccid muscle tone (Secara, 2007). Although some children with autism have difficulty in performing complex motor tasks (climb on a trellis, buttoning or zipper), other children may have motor skills very well developed (using PC at very young ages, use of stereos etc) .

Also, it talks about the presence of a deficit in motor coordination, posture instability, lack of energy and muscle strength, poor balance control, clumsiness in overcoming obstacles, poor control of speed, difficulty to organize the whole body in a single integrated driving action, hypotonia, index-police opposition, articulate speech and poor motor imitation capacity (Layartigues, Lemonnier, 2005; Muraru-Cernomazu, 2005, Secara. 2007; Ingsholt, 2002).

Graphomotricity correlates with the trunk stability and with the relation between the shoulder-elbow and the radiocarpal joint. Motion radiocarpal wrist and fingers allows the pen to be worn fluid without being involved the entire arm or shoulder.

The problems of strength and skill of the hand is seen from the preschool period and must be addressed as early therapy. Any activity of the fingers and hands stimulates the development of fine motion" (Secara, 2007; Layartigues, Lemonnier, 2005). There are references to the autistic children's writing to whom the macrographic feature may be due to lack of motor coordination (Muraru-Cernomazu, 2005).

The difficulties experienced by autistic children in the area of motorized planning (ability to plan a move, and once initiated, the ability to predict the course and outcome) can leave their imprint on the social imitation tasks but also on simple non imitation tasks orientated toward a particular purpose or motor skills (Muraru-Cernomazu, 2005; Secara, 2007; Preda, 2005, 2008; Layartigues, Lemonnier, 2005).

Trying to explore, to know the world and especially his own world, in terms of diversity of things that are part of him, normal child becomes aware that he is the author of exquisite acts (eg, hand movement, fingers, feet). Self begins to develop in times when the child sets specific goals, objectives, wishes to acquire certain assets (objects), and for this he has to make an effort to become successful, a success (Muresan, 2004; Layartigues, Lemonnier, 2005).

Autistic children's behavior in this realm is a special one, indicating a deviation of the self. As autism is a deeper and the child is submerged deeper into a world of its own, the world, the child's life is inoperable, rigid, wilderness, full of dull and stereotyped mannerisms. Avoiding eye contact, gaze fixed untargeted, are made in order not to charge new stimuli (Mureşan, 2004;

Layartigues, Lemonnier, 2005; Sheinkopf, Siegel, 1998), "enemies" of their own world, not seeing and not being aware of what is happening in the world around them. As a result, through a damaged ego, unanchored in reality, the child may develop an aversive behavior towards everything that surrounds him, abandoning any way to communicate with the outside world. Over time there have been developed various methods and techniques in the field of autism intervention, aimed in particular for the affected areas in the development of autism but also in the stereotyped, repetitive behavior.

Treatment of autistic spectrum disorders is variable, depending on the age of diagnosis, severity of symptoms and their impact, other related diseases, social and family environment, access to education and healthcare, social protection and reintegration measures available.

There is no cure for autism spectrum disorder, but the intervention's goal should be the maximization of the individual's potential and the improving of a long-termed quality of life.

Early intervention (before the age of three years) is associated with better long-term recovery, but treatment is useful at any age. Interventions that have proven most effective are behavioral psychotherapies and related communications, those targeting children-parent networking and those that develop communication skills and social networking. This means that parents will work with therapists to assimilate techniques that encourage the acquisition of new skills, their maintenance and generalization in different contexts.

Case Study

General Presentation:

Name and surname: C. A.

Date of birth: 11.25.2010.

C.A. lives with his parents and sister, who is diagnosed with Asperger Syndrome. His mother is a housewife and his father is a teacher.

The child's relationship with his family's members are normal, his parents being preoccupied with their offspring's growth and social integration.

The youngster's birth was a normal one, the labor during six hours, and the newborn's position was with the umbilical cord surrounding his neck. He weighted 3.400 kilograms and was breastfed until one year old. He could sit, with help, at the age of seven months and could walk, without being assisted, at thirty-two months old.

C.A. was diagnosed with: infantile autism at three years old, hyperactivity, and Pica Syndrome.

He is taking medication for behavioral disorders and psychomotor agitation.

Educational measurements before programs:

- C.A. attended the Normal Program Kindergarten, and, at the conducted activities during the curriculum, the child's mother also assisted. Today, the child is attending the secondary school, and his mother took the role of his shadow.
- For two months, once a week, C.A. has benefited from an A.B.A. therapy, but, due lack of funding, the family has to renounce upon the treatment.
- Since three years now, the child attends the Mentally Disableds' Association, "Integra Arad".

Landmarks:

Motor development: C.A. could walk, with adult's support, at eighteen months old and, independently, at thirty-two months old; he cannot walk on his tips; shows underdeveloped general and fine motion; stereotypical upper limbs movements: finger shakings.

Self-service: will not eat alone, underdeveloped personal autonomy.

Lingual abilities and language or communication use: frequently uses words and sentences, predominantly in English; utilizes immature grammatical structures; has comprehension disruption when talking; shows difficulties in communicating desires; can mechanically reproduce melodies, but without any showing emotionality.

Social interactions: does not cooperate in group activities, has sustained visual contact, tends to be aggressive, lacks emotional manifestations, does not initiate games, does not show interest in toy maneuvering.

Short-term objectives:

Growth in cooperation abilities.

Promoting communication development.

Long-term objectives:

Improvement of life quality through sensorial stimulation, facilitating autonomy and development, and betterment of concentration and attention aptitudes.

Information gathering methods: observation when it comes to both behavioral and functional evaluation.

Activities:

- Aural stimulation: musical instruments, musical bed, toys that make noise;
- Tactile stimulation: different textures and size materials (balls, elastics, touch pouches, tactile instruments, such as: brushes, whisk, massage brush, nail brush, vegetal brush, painting brush, lufah and sponges, kush ball, massage glove, volcanic pebbles, rings, sharp-edged toys, colored

touch balls, suspended ball, ice bag, face mask, massage device, elastic balls, play dough, fuzzy materials, sandbox, finger paint, cotton balls, feathers, rice boxes);

- Visual stimulation: liquid disk projector, interactive bubble tube, magic ball, lighted toy cloud, mobile projector, light falls, light spheres and light boxes, fluorescent materials (the tube, the cloth, the wool, particles, orbs), intermittent lights, toys that do sound or lights;
- Olfactory stimulation: diverse essences, aromatherapy device, flavors;
- Vestibular stimulation: bobath ball, route, hammock balancing, spins, tumbles, dancing.

The courses are predominantly agreeable, C.A. is attracted by instruments found in the multisensorial room. Occasionally, C.A. refuses to collaborate, becomes angry, yells, runs in circles, overturns objects in his perimeter.

The therapist has a nondirective attitude, letting the child choose the games that stimulate his mind and give him the sense of success. After some time, C.A. opts for another game of a higher difficulty, that will represent a challenge anew for him. In this natural way, through self-insured success, the child will develop an auto-healing process.

Conclusion:

Following his sensorial integration therapy two times a week, forty minutes being a session, for one whole school-year, C.A. recorded significant progress when it comes to communication and language skills. He developed phonological awareness abilities in Romanian, using three to four words with sense.

There were no recorded advances in social relationships, and still refuses to play with other children included in the program, vehemently protests when asked to tidy up the objects he overturned, in maximum frustration moments runs in circles, yelling senseless sounds.

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