

Therapeutic interventions applied for children diagnosed with autism – A study case

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Abstract

The paper present the case of a subject named Octavian (name which is not the patient's real name as it has been chosen in order to protect his identity), a child diagnosed with autistic spectrum disorder.

During the therapy which lasted one year and a half Octavian only benefited from applied behavior analysis (ABA) interventions as the parents refused the medical treatment for fear of possible side effects. Towards the ending of the therapy period, in the last 2 weeks the parents agreed with medication administration.

At first Octavian's therapy program started with sessions which lasted for 2 hours per day, following an increase of 5 hours per day, as the therapist worked for 3 hours in the morning and 2 hours in the afternoon. After the applied behavior analysis (ABA) interventions, the patient's behavior and evolution has been observed also under the effect of Risperidone medical treatment, as at that moment initial received dose was of 0.25 mg.

Considering the disorder's symptoms and the relatively long period of time in which the patient could be monitored, we consider that Octavian's evolution is representative for the autistic spectrum disorder.

Keywords: *autistic spectrum disorder, applied behavior analysis (ABA), medical treatment.*

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I. INTRODUCTION

In the past years, autism has been widely discussed as this disorder is accompanied by the necessity of offering high quality services, issue towards which Romania does not represent an exception. From the mothers of children diagnosed with autistic spectrum disorder which we owe the introduction of superior standards of good practice in therapy and care of persons with autism to scientists preoccupied with finding a coherent explanation and effective treatment for this disorder, thousands of people from around the world contribute to ameliorating such suffering (Higgins, Bailey, & Pearce, 2005; Davis, & Carter, 2008; Kogan, Blumberg, Schieve, Boyle, Perrin, Ghandour, & van Dyck, 2009).

Within this context, several studies have been imposed on two main treatment methods: the most common is the therapy based on Applied Behavioral Analysis (Gillberg, & Coleman, 1992; Spreckley, & Boyd, 2009) while the second is represented by the medical treatment based on Risperidone (McCracken, McGough, Shah, Cronin, Hong, Aman, & McMahon, 2002; Luby, Mrakotsky, Stalets, Belden, Heffelfinger, Williams, & Spitznagel, 2006; Aman, Arnold, McDougle, Vitiello, Scahill, Davies, & Lindsay, 2005).

The applied behavior analysis (ABA) intervention is a structured therapeutic set which follows realistic and doable objectives (Granpeesheh, Tarbox, & Dixon, 2009; Foxx, 2008; Goin-Kochel, Myers, & Mackintosh, 2007). Such objectives are defined following a result based on collecting data regarding the observable behavior of the subject (Dawson, Rogers, Munson, Smith, Winter, Greenon, & Varley, 2010). The main characteristics of this intervention involve the fact that it is more applicable and also behavioral and analytical (Peters-Scheffer, Didden, Korzilius, & Sturmey, 2011; Nikopoulos, & Keenan, 2006).

Regarding the use of medication treatment recommended for the autistic spectrum disorder Risperidone is the active substance of the medication found in Romania under the name of Rispolept and Rispen.

Risperidone is mainly an antipsychotic, with positive effects in the case of behavioral disorders. The medication is also utilized in the treatment of other disorders which manifest through aggressiveness and physical and verbal self-aggressiveness, psychometric agitation or tantrums (Nagaraj, Singhi, & Malhi, 2006; McDougle, Scahill, Aman, McCracken, Tierney, Davies, & Vitiello, 2005). Another reason for which Risperidone is preferred compared to other antipsychotics in the treatment of children and teenagers is the high level of safety regarding low-age administration (Masi, Cosenza, Mucci, & Brovedani, 2001).

II. CASE HISTORY

Octavian is an only child, aged 4 years and one month. He has been diagnosed with autistic spectrum disorder at age 3. The initial diagnosis was of ADHD, considered to be caused by his speech delay. At that moment the parents contacted a psychotherapist whose work hypothesis was that the child was not suffering from any disorder and that his case needed a couple's counseling. Therefore Octavian's parents started couple's therapy and were involved for several sessions, until the mother made the decision of interrupting the process and asked for different opinions.

After receiving the autistic spectrum disorder diagnosis, the parents refused to administer Risperidone as prescribed by the doctor, for fear of adverse effects. They contacted an ABA therapy specialized center. In the moment they considered that Octavian did not make enough acquisitions and the behavioral issues escalated, they decided to give up on the center's services and initiated home therapy.

According to the parent's descriptions, some of the first symptoms appeared around the age of 2. One of the first signs consisted in the self-stimulating behavior of the child which involved actions such as spinning different objects followed by inadequate and poor play several types of objects. The child started to lose the acquisitions he has made until that point (consisting of a few words such as "Come on", "Give me", "Grandpa", etc) and developed more and more disruptive and self-stimulating types of behavior.

The family history shows that both parents are aged up to 35 are still employed. The mother is an economist, has a stable workplace and the father is a jurist. During the working hours, the child is taken care of by the maternal grandfather.

During a period of 2 weeks time, information and data has been collected according to the functional analysis, as the child has been observed during free play, in simple tasks both in a structured and non-structured environment (sorting balls by color, identifying objects placed horizontally or within a non-linear, random setting following the adult's instructions, etc).

Data obtained through observation and monitoring have following the sides of development until the age of 4, while as a result of the interviews involving the parents other information has been collected and is exposed as follows.

III. EVALUATION AND OBJECTIVES SETTING

3.1. Behavior

Octavian lacks imitative behavior, therefore he cannot imitate nor spontaneously nor by other people's request. Also the child lack compliance and instructive control – as he does not respond to instructions of the others, proving a strong lack of cooperation. Octavian shows bizarre spontaneous, intense behavior. For instance, he hits himself by the back of the couch, strongly and repetitively.

He presents aggressive and self-aggressive behaviors such as yelling, slapping and hitting, pinches, bites, pull other people's hair, crawls, hits himself in the head, bites himself.

The child manifests intense self-stimulating and strong behaviors: spins objects, rocks, waves his hands, throws objects, spins, jumps, involuntarily evokes repetitive sounds, smells and eats products persistently and in an inadequate manner – pica (likes to eat soap, shaving cream and hand cream). The child does not make eye contact with another person or is only capable of supporting it for a short period of time.

Octavian has only a few activities towards which he shows interest and most of the times he shows reserves towards new activities – for instance he refuses to draw with his hands or build with other blocks except for Lego).

Within the present study case, the short and medium time objectives consisted in determining Octavian to imitate the adult's actions and maintain 3 to 5 second of the eye contact.

In addition, the long term objectives regarding his behavior included increasing the number of adequate activities (Lego and different types of block construction, riding the bike or basket – throwing the ball, watching cartoons) and the time Octavian spends for these activities (minimum of 2 minutes). The role of these activities is to direct the child towards functional activities in spite of the inadequate ones.

3.2. The reward efficiency

Within the therapeutic approach, the initial phase represented following the response possibilities of the child, as they were followed by offering a preferred item as a rewards. In this situation, the reward is defined as a positive consequence of a desirable behavior, having the role of increasing the frequency of this behavior in the case of the child with an autistic spectrum disorder.

When he is offered a preferred item, Octavian reaches for it with his hand. As for the list of preferred items, it is relatively low and they don't function as rewards contingent to an adult's instructions. When he is asked to make an action in order to have access to a preferred item, Octavian is most likely to give up than to accomplish the request or to protest (by yelling, crying,

hitting his head) if he does not receive what he desires immediately (milk, for instance) under the conditions he requests (in bottle, lying in bed, covered with a certain blanket).

List of preferred items includes:

- Edible items: milk;
- Toys: balls, spinning top, jumping ball;
- Activities: climbing, jumping in bed.

The objectives within this level related to exposing to a wide range of games, toys and activities in order to identify a list of preferred items to serve as motivation in accomplishing the tasks proposed by the adult. Thus we follow and increase of the positive response rate regarding the adult's instructions and the compliance level.

3.3.Sensations and perceptions

Octavian is in high need of olfactory, tasting, tactile stimulation as he insistently explores different objects available in the environment, using both the tasting and olfactory senses. The child proves a high hearing acuity (hears dogs barking in the street before anyone else in the room).

The child has difficulties in identifying images (could not identify an image representing a known object, a field of two images placed horizontally), in scanning objects and images within a field of more than 4 items, as the child perceives and scans objects which are placed in parallel lines. Thus Octavian pay show a toy horse and a pencil if they are place one by another horizontally but cannot show them correctly if they are placed vertically, perceives images and objects presented randomly, identifies images in a book but could not show images in a known book for any of the requested items.

The evaluation of visual performance sights the child's possibilities to solve a puzzle suitable for his age (2-3 large pieces), the degree in which the child succeeds in matching identical objects of functionally sorts them.

Octavian did not succeed in independently solve the puzzle for reasons of lack of interest and also for reasons which relate to the level of drive ability. The time independently spent in activity (without being prompted) does not pass 10 seconds.

The medium time objectives are: increasing the time spent in such activities (minimum of 3 minutes), completing at least 3 puzzles, solving 2 puzzles of 2 pieces each, teaching geometrical shapes in several types of matching boxes. The long term objective is for Octavian to learn to recognize at least 50 images in books.

3.4.Communication and repetitive speech

The receptive speech involves the child's capacity to process spoken language and consists in understanding and executing received instructions (Barbera, 2007).

Octavian did not make eye contact when he has been named, cannot respond by "yes" or when his attention is requested, due to his impossibility to talk. The child has not proven to understand speech, as he has not been able to accomplish instructions such as "pass me the ball", "open the book", "knock with the hammer" or "knock the door".

The objectives consist that Octavian answers to instructions which firstly assure compliance ("come to me", "give me...") but also functional instruction within several games ("push the door", "kick", "baby kiss"...etc). Also, in this type of lesson, Octavian should be able to identify at least 50 objects initially in a series of structured manner, than within the proximal area (home, his room, the kitchen, etc).

3.5.Expressive speech

Octavian is non-verbal, has difficulties of initiating and maintaining speech, as the main way of requesting what he desires is by yelling which raise their intensity when the request is not answered fast enough or when he considered is not well understood. On rare occasion he has the tendency of pulling the adult towards the area of interest – where the item is found – without pointing to it. Octavian does not verbally imitate sounds or words. He also has no control over the sounds he makes, as they at most have a role of self stimulation.

Medium and long term objectives: firstly Octavian will learn to ask through alternative modalities utilizing PECS and/or the language of signs. Once he starts to have control over a modality of requesting, the next objective would be to make a number of at least 100 requests per day. Another important objective is for Octavian to initially imitate the sounds produced by the adult, followed by the syllables which construct words that the child might functionally utilize.

3.6.Development and functioning of thought

Octavian lacks the capacity of spontaneous learning. During the evaluation he proved that he can only learn in a structured environment. A relevant aspect is that he has a poor body schema, as he cannot correctly name his body parts – the only body part he is able to indicate is the head. Initially, the evaluation of the thinking processes has been delayed, taking into account the very small number of knowledge he has proven to own.

Objectives: Octavian will learn to correctly indicate his body parts. After mastering the items of other programs, they will pass through a generalization process, gradually modifying the utilized objects, the environment in which they are presented and the way in which they are applied into actions.

3.7.Attention

During the evaluation Octavian has shown a fluctuating attention, with a very low span (3 to 5 seconds). Objective: increasing the period of time in which the child is involved in an action (minimum 3 minutes).

3.8.Memory

As far as the short term memory is concerned, the child proves a good capacity of memorizing within a structured environment. As for the long term memory, there is a tendency of losing acquisitions if they are not applied for a longer period of time.

Objective: after mastering the items of the current programs Octavian will be involved in sessions of maintaining them, each day for 15 to 30 minutes following that in time, the frequency of these actions to be diminished (once every 2 days, 3 times a week, once a week, etc). From this point of view, the therapist will propose games through which the child has the possibility to exercise the abilities learned within a structured environment.

3.9.Affectivity

The child presents a very low frustration tolerance, may quickly pass from irritability to intense anger when a need is frustrated or may refuse a request even temporary. An affective instability has been noticed, as the child quickly passes from a state to another depending of the context, being able to simulate negative affective states in a very credible manner.

The main objective was to increasing the frustration tolerance by a graduate increase of the time in which Octavian received a wanted item and by increasing the number of requests until obtaining such an item.

Another objective was decreasing the frequency of tantrums and their intensity by preventing such behaviors right from the first signs, lowering the difficulty of requests and ignoring such behaviors when they tend to escalate.

3.10. Self-help behavior

The evaluation has shown that Octavian did not present self-help behavior (as the other members of the family delivered such tasks). At the beginning of the therapy he was still wearing diapers and drinking milk with the baby bottle, did not drink using the glass or cup, somebody else needed to feed, dress and put his shoes on, etc.

Objectives: the child will learn to use the bathroom – at first with help, then by himself, wash his hands, drink with a cup or glass, dress and undress – initially with easy clothes (elastic trousers, short t-shirts, etc) with minimum help of an adult.

IV. THE INTERVENTION

Considering the objectives defined as a result of the evaluation, the initially applied programs for Octavian for the first 4 months of intervention consisted in: identifying using 3D objects, fine motor imitation, wide motor imitations, imitation with object, functional instructions, instructions with object, PECS, body parts, hygiene program, activities for fine motor improvement, program of dressing and undressing t-shirt and pants, program for drinking from cup and glass, program for hand washing, wooden puzzle, 2-piece puzzle, Lego/wooden block pieces, toy cars itinerary, color sorting, vocal imitation – letters "a", "i" and "m", oral imitation and matching identical objects.

The therapeutic intervention debuted during the first 2 weeks by building the therapeutic relationship. It is to mention that during the independent play, the child could not make any significant progress. As the color sorting, vocal and oral imitations have become aversive for Octavian, we have reached the conclusion that it would be a better option to put these programs under a pause. Also, considering the very slow progress as far as the PECS method was concerned (Picture Exchange Communication System) we have decided to introduce signs of mimic and gestural nature that Octavian could use in order to ask for what he needed. The programs for object imitation were suitable for maintaining as Octavian started to generalize such type of imitation. Until that date Octavian mastered along with the therapist the activities such as self-help which include: drinking using the cup and the glass, dressing up and undressing t-shirt and trousers. He still needs prompts in order to wash his hands and cannot use the bathroom by himself. As long as he is guided according to the program (in intervals of approximately an hour at the moment) he does not show any incidents related to urinating.

The incidence of tantrums during therapy is lower - from 5 per week they have decreased to 3, their period has become lower – from a mean of 1 hour and a half to 30 minutes, and also their intensity has become lower. Another significant progress is that, from 2 items which could have been utilized as a reward in therapy we have reached 8 items for which Octavian is willing to work, his compliance showing significant increase.

The work hours were gradually modifying, depending on the pre-acquisitions obtain during therapy. The list of programs after the first 4 months of the therapy included: 3D objects identification, fine motor imitation, wide motor imitation, instructions with no objects, images discrimination, object scanning within a random field, request using sign language, colors, simple geometric forms, body parts, puzzle, Lego construction, matching non-identical objects, motor development activities, hand washing program, toilet training program, "Give me...", "Go to..." and Categories.

The most important acquisition of the patient is recorded during the next 4 months of therapy namely image discrimination, as Octavian could learn using 2 D materials.

Octavian carried on with mastering items within the program of object identification in a very satisfying timing. Once he has started to fluently master new items within the Image discrimination program, this program has been interrupted, as Octavian could learn from that moment using images. In a similar way he has learned shapes and colors, so that these items could be passed to generalization through games (puzzle with geometric shapes, Lego constructions, with certain colors, etc.) and a more complex program: Treat/Function/Category. No program insertation was needed for learning the Objects functions, as the child proved to know which the function of the requested objects was. As far as the categories are concerned, he seemed to understand well that an object can also be part of a category, showing no difficulty in mastering items specific to this program.

By the end of the first year of therapy, Octavian's program included: PECS, sorting, objects scanning, vocal imitation, oral imitation, locations, occupations, people, letters, body parts, trait/function category, "Go to ...and Give me...", actions, identifying objects in images, identifying objects through books, identifying objects in the environment, fine motor imitation, activities of fine motor imitation, letters and numbers generalization in block games, shape sorting box, Lego construction/wooden blocks, basket-throwing ball, Puzzle and help request through Sign language.

During the following phases the therapy included the addition of structured programs of the following type: "Go to..." and "Give me..." during which the child had to learn to follow instructions such as: "Go to the door" or "Give me the pen". For Octavian the deficitary understanding and the lack of compliance outside of a structured frame stopped him from correctly follow such instructions. Ulterior, the mastering and generalization of such requests allowed the extending of the therapy program in more of the rooms in the house, as the instructions could be more functional (i.e. "Put the pillow on the bed", "Put the book in the shelve", "Give me the phone").

Octavian initially started to ask to use the bathroom through signs, when he was not involved in an activity with an adult and also started to walk by himself. Because of the fact that the adults around him could not embrace the needed types of behavior, the dressing and undressing could not be generalized and maintained and the dining program could not be followed.

There was no need of separately teaching the Categories, Shapes, Colors, Object identification programs, as all of these could be reunited within a single program. The attention was improved as it was incidentally educated during each session.

The therapy reached to results from the point of view of improving the child’s cognitive performances (Leaf, & McEachin, 2010). On the other hand, results were less visible from the point of view of behavioral modifications. The main benefit was the increase of the compliance which was generalized among the family members, but regarding disruptive behaviors – precisely the aggressiveness and self-stimulation, no significant results were recorded; this fact was also due to the fact that no sustainable intervention was conducted in order to diminish them.

During the former 2 weeks of Octavian’s therapy the child was also observed under the treatment with Risperin, 0.25 per day. Because the appearance of behavior modifications was followed, once the treatment was started, a functional analysis was made of the most frequent disruptive behaviors of Octavian, as the resulting data were the following:

Table 1. Most frequent disruptive behaviors of the patient

Behavior	Duration (consecutive seconds/minutes)	Intensity (on a 1 to 10 scale)	Frequency (during a session)
Screaming	Maximum 3 minutes	Maximum 8	Maximum 3
Crying	Maximum 2 minutes	Maximum 6	Maximum 4
Slapping his head		Maximum 6	Maximum 17
Byting himself	0	0	0
Throat clenching	0	0	0
Slapping	-	Maximum 7	Maximum 5
Pulling hair	Maximum 7 seconds	Maximum 4	Maximum 2
Crawling of floor	Maximum 30 seconds		Maximum 3

Such behavior has reduces significantly once with emerging the medical treatment, as an eloquent example shows the decrease of screaming which did not reduce to under half an hour since the beginning of therapy, and during these 2 weeks, did not pass 3 consecutive minutes and did not reach an intensity higher than 6.

Another significant benefit of the medical treatment is the regulation of sleeping hours as reported by the child’s parents. For the past 2 years the least, Octavian did not go to sleep earlier than midnight and used to wake up frequently during the night, most of the times being irritated during the morning. Ever since the first week of treatment he has started to go to sleep between 9 and 10 pm and did not wake up during the night, sleeping regularly until around 6:30.

V. CONCLUSIONS

Octavian continued the therapy and succeeded in generalizing more and more of the achieved knowledge and learned new aptitudes. Despite the fact that during the entire period it has been sighted to keep a coherent program to reach all areas of development specific to his age, the intervention had an evolution dictated by the patient's condition and individuality. Professional literature shows that a trait specific to people suffering from autism is that they can reach high levels of performance in certain areas and very low in other areas (Austin, & Carr, 2000; Leaf, & McEachin, 2011). Octavian was not an exception, as the child could discriminate between naming an item, its function, the category in which it is part of and its color but had high difficulties in imitating the OK sign or pouring water in a glass.

The most important aspect which we need to take into consideration regarding patients of such condition similar to Octavian's is the fact that choosing between therapy and medication cannot be sufficient separately - in order to reach significant levels of achievement in the case of an autistic child. When the symptoms are wide, as shown in the present case, both modalities of treatment are necessary simultaneously.

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