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CASUISTIC PAPER

Speech development delay in autism spectrum disorder – the perspective of using the "Talk To Me" speech therapy application

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ABSTRACT

Introduction and aim. The paper aims to present the prospects of using the „Talk To Me" application in the case of a child with this neurodevelopmental disorder.

Description of the case. The subject of the study was a 53-month-old boy who did not communicate verbally, but behaved forcefully. A child underwent a speech therapy using the „Talk To Me" application for a period of 12 weeks. The scale of acquiring language skills in the field of communication competence was used to monitor the progress of therapy. In the analyzed period, a decrease in the score on the scale from 23 to 15 points was observed, which means a result indicating an improvement in the communication sphere. The use of a newly developed therapeutic tool was an important motivational factor and, in the opinion of the boy's mother, significantly influenced the progress in therapy, which had not been observed before using a conventional approach.

Conclusion. The „Talk To Me" application is a therapeutic tool with potential effectiveness in the case of speech delays in children with autism spectrum disorder, and it is also compatible with behavioral therapy, a widely used therapeutic method with proven effectiveness in autism spectrum disorder.

Keywords. autism spectrum disorder, speech development delay, „Talk To Me" application, therapy

Introduction

Autism was decribed for the first time in 1943 in the article entitled „Autistic Disturbances of Affective Contact". Based on the analysis of 11 cases of children aged 2 to 8 years, it was concluded that the key symptoms occurring in this group of patients are stereotypical and repetitive patterns of behavior, preservation of sameness, restricted interest in activities and lack of communicative use of language.[1,2] Currently, according to the criteria of the Diagnostic and Statistical Manual of Mental Disorder (DSM-5) from 2013, autism spectrum disorder (ASD) is a neurodevelopmental disorder characterized by core symptoms such as deficits in social communication and social interaction, as well as restricted, repetitive behaviors.[3] Moreover, ASD often co-occurs with other deficits or disorders, including Attention Deficit Hyperactivity Disorder (ADHD), anxiety disorders, or tics and both core symptoms and other abnormalities that frequently co-occur in children with ASD may be characterized by very different intensities and co-occur with each other in various combinations.[4-7]

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The incidence of autism has increased rapidly since the 90's.[8] Currently, prevalence is estimated as approximately at 1 in 100 children worldwide. However, numerous authors provide much higher rates specific to defined areas or countries, and data from some low- or middle-income countries are frequently scarce.[9] Statistical data indicate higher incidence of the autism in boys than in girls – of course, the rates vary depending on the study group.[10] Early symptoms of ASD are observed as early as in the first two years of life. In terms of diagnosis, the role of specialists is crucial, as parents seek Professional assisstance for various reasons i.e. delayed speech development, abnormalities in motor development, „bizarre" behavior, lack of response to name, impaired sensory integration, problems with adaptation in kindergarten etc.[11-13] Parents and professionals who have daily contact with children in various care and educational facilities not necessarily recognize the need for an autism diagnosis. Therefore, it is important to detect symptoms that may indicate autism spectrum disorder early and refer the child to the diagnostic track. Hence, the education of doctors, educators, physiotherapists, occupational therapists, psychologists and speech therapists in recognizing the symptoms of autism is a very important issue.[14] However, autism is still diagnosed relatively late and the average age at diagnosis is 40 months.[15,16] In the United States, the average age of diagnosis is relatively late at 4-5 years of age.[13] Delayed diagnosis of ASD may be attributed to two main groups of factors: clinical and socioeconomic. From a clinical perspective, children who are high functioning and use speech to communicate are later diagnosed. In turn, socioeconomic factors that potentially negatively influence the time of ASD diagnosis include: gender, race, ethnicity, income and parents' educational level.[9,17-19] Often, an early symptom of autism that worries parents in young children is delayed speech development, which may occur in the case of ASD.[20] However, an important aspect that allows for differentiating speech delays from autism-related speech delays is trying to use other forms of communication to achieve the intended goal.[21] Motivating a child with ASD to communicate is an important factor determining the effectiveness of therapy, but it often requires the introduction of very creative solutions and appropriate waiting time for the child's reaction.[22] The literature often emphasizes that the lack of motivation to communicate is the main obstacle in teaching speech and language.[23]

Aim

Children with the ASD constitute a special group of patients requiring therapy due to speech development delay, therefore the purpose of this paper is to present the perspective of using the „Talk To Me" application in the case of a child with this neurodevelopmental disorder.

Description of the case

Presentation

The description of the use of the therapeutic tool (Talk To Me application) concerns a boy aged 4 years and 4 months diagnosed with ASD demonstrating delay in speech development. A child with a negative perinatal history: a cesarean section delivery due to lack of audible baby's heartbeat followed by resuscitation. At the age of 18 months, a clear developmental regression in speech was noted in the child. For the purposes of differential diagnosis, hearing was tested three times. In terms of gross motor skills - data from the child's observations: the boy walks on his toes, visible signs of excessive mobility and motor mannerisms occurring when excited: jumping, clenching his hand into a fist. The medical history indicated shows a great need to bite, knock on objects, a lot of vocalizations, attention deficit disorder, enjoying music and watching cartoons. Due to abnormalities in psycho-motor development and delayed speech development, from the age of 30 months he was subjected to comprehensive therapeutic treatment, including speech therapy. The boy did not communicate verbally, he satisfied his needs by presenting difficult behaviors.

The study was approved by the Bioethics Committee of the College of Medical Sciences of the University of Rzeszow No. 4/11/2020 and the child's parents gave written consent to his participation in the project. The duration of the intervention was 12 weeks, and the therapy using the „Talk To Me" application was conducted by a specialist (speech therapist) in the presence of parents. Before starting therapy, language functions were assessed in order to plan therapeutic procedures (including analysis of syllables articulated in spontaneous situations) – baseline assessment - test „0" before the start of the intervention, follow up in the middle of the therapy period after 6 weeks and after the end of therapy (after week 12). A new therapeutic tool was used in the child's therapy in the form of the „Talk To Me" application for the treatment of speech delays and acceleration of the acquisition of communication and language competences. The training time with the tool was 30 minutes/once a week. A simplified diagram of the application's operation is presented in Fig. 1.

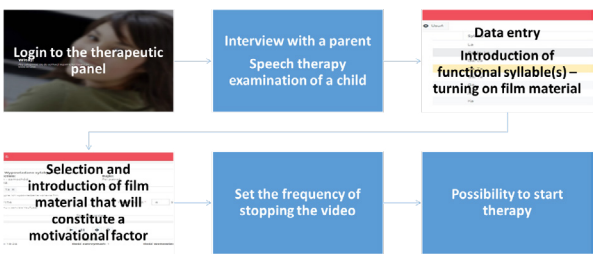

Fig. 1. „Talk To Me" application operation diagram

Therapy progress was monitored using the scale of language skills acquisition in the field of communication competence (LSAFCC). The tool allows for a quick and easy assessment of the examined aspects (communicating needs, speaking/responsible for the child, asking the child to say or repeat, the way of nodding/denying, saying/repeating syllables). Depending on the aspect, the assessment is made on a scale of 0-1 or 0-2 (where 0 means a correct result, and 1 or 2 – conditions deviating from the normal pattern), and the points obtained are summed up.

During the 12-week intervention, the boy obtained a score of 23 on the LSAFCC scale at the baseline measurement, which meant very low competence in the aspects examined by the tool. After the intervention, the result decreased by 8 points and amounted to 15 points, which is a 34% improvement compared to the result obtained during the diagnostic test. Table 1 presents descriptive statistics for the boy's outcomes during the intervention period.

Table 1. Descriptive statistics for LSAFCC scores

x	s^2	*S*	Min.	Max.	*R*
15.50	5.91	2.43	15.00	23.00	8

x – mean, s^2 – variance, S – standard deviation, Min. – minimum, Max. – maximum, R – range

The information received from the child's mother shows that the use of the tool in the form of the „Talk To Me" application was a factor that had a significantly positive impact on the development of the child's language skills. She assessed the therapy as more effective compared to conventional therapy in which the child had participated so far, and emphasized that the use of this type of solution resulted in greater interest of the child, improved concentration of attention, significantly extended the time of effective work and improved verbal communication in order to meet the need. In the studiem boy, the use of a motivational factor in the form of his favorite fairy tale was an important motivating factor.

Discussion

In the described case, the use of a modern technological solution in speech therapy in the form of the „Talk To Me" application for a child with autism spectrum disorder was associated with increasing its effectiveness and achieving a good therapeutic result. What is important is the fact that the application, thanks to its design enabling the playback of any selected film material (favorite fairy tale or program), was an important motivational factor, determining the child's involvement in therapy and, therefore, its better result – it motivates the child to talk (replaying the film is only possible in the event of uttering an appropriate voice command) and gives the speech effective power (meeting the need to watch the material). The literature on speech therapy in the autism spectrum emphasizes the need and importance of motivating the child to communicate verbally. One of the important aspects is the fact that children choose other, potentially easier ways of nonverbal communication, e.g. crying or mild tantrums in the early developmental period, which may potentially evolve later into difficult behaviors of varying intensity.[23,24]

It is a well-known fact that early detection of abnormalities, reporting to a specialist and making an early diagnosis of autism spectrum disorder is a very important factor. It determines the early implementation of therapeutic interventions and, consequently, the most optimal result that translates into the child's functioning in the later period.[25,26] Of course, this is influenced by the fact that the level of functioning of children and adolescents with ASD is very diverse: from mild to profound deficits visible in various contexts and areas of functioning.[27] The talk to me application, thanks to its simplicity (acting on the principle of positive reinforcement, building a sense of agency) and the possibility of introducing film material from any publicly available websites, can be successfully used both by younger and older children and children with ASD characterized by varying degrees of intellectual functioning. However, this will be the subject of further research and analysis.

Children and adolescents with autism spectrum disorder have specific needs in the field of upbringing, care, therapy and education. Ensuring their Leeds are met them should be the responsibility of the environment in which the child stays, i.e. the family environment and individual educational levels and care institutions (nursery, kindergarten and school). Unfortunately, education and therapy are still a common issues reported by parents of children with ASD.[28] The literature still raises problems in terms of cooperation, Communications of problems, insufficient knowledge and adequate support for this group.[29] Moreover, there is a visible need to implement interventions with scientifically proven effectiveness in various types of facilities in order to support the therapy and development of children and adolescents with ASD.[30] The „Talk To Me" application is a tool that potentially constitutes a solution that, in many cases, can improve the effectiveness of speech therapy in various institutional and non-institutional settings for this group of children.

Study limitations

As this is a case report, the conclusions cannot be generalized to all cases of children on the autism spectrum presenting a delay in speech development. It is therefore necessary to test the newly created tool on a sufficiently large group of children with this disorder.

Conclusion

The „Talk To Me" application is a therapeutic tool potentially effective in the case of speech delays in children with ASD also compatible with behavioral therapy, a widely used therapeutic method with proven effectiveness in ASD.

Declarations

Funding

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Author contributions

Conceptualization, W.A.W.; methodology, W.A.W., L.P. and J.P-B.; software, P.P. and J.P-B.; validation, L.P. and J.P-B.; formal analysis, P.P. and J.P-B.; investigation, W.A.W., J.P-B., L.P., P.P.; resources, L.P. and J.P-B.; data curation, P.P.; writing—original draft preparation, W.A.W., J.P-B. and L.P.; writing—review and editing, W.A.W., L.P. and J.P-B.; visualization, P.P.; supervision, L.P.; project administration, L.P.; funding acquisition, L.P. and J.P-B.. All authors have read and agreed to the published version of the manuscript.

Conflict of interest

The authors declare no conflict of interest.

Data availability

The datasets analyzed during the current study are presented in this article.

Ethics approval

The study was approved by the Bioethics Committee of the College of Medical Sciences of the University of Rzeszów No. 4/11/2020. Written informed consent has been obtained from the patient to publish this paper.

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