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EARLY INTERVENTION AND THE IMPORTANCE OF AGE IN THE RECOVERY PROCESS OF AUTISTIC CHILDREN

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Autism is a neuro-developmental disorder with an increasing incidence and for which there is no clear cause and no effective treatment. Impairment of social skills, communication and language capacity, executive function and cognitive capacity are often associated with autism. Therefore, the recovery of children with autism so that they become functional people, integrated in society is very important. This is achieved through individualized behavioral therapy adapted to each child and his needs. Studies show that early intervention, as well as the number of hours of therapy and family involvement, increase the chances of autistic child recovery. The purpose of this research is to see how the age of therapy starting influences the subsequent progress on several areas of development, on their way to recovery.

The research was performed on a group of 30 children with ASD (Autism spectrum disorder), aged between 3.5 and 17 years, from a therapy center from Romania. The children received 6-8 hours of therapy weekly for 2 years and the progress was evidenced by the application of the ABAS II test at the beginning and end of the therapy.

The data shows that, on average, children who started therapy earlier than 3 years old have greater progress than those who started therapy between 3 and 5 years or even over 5 years, in the 2 years of monitoring, on ABAS II areas of development (Conceptual, Social and Practical).

This research supports the hypothesis that earlier intervention therapy counts for autistic children's recovery and is associated with greater progress in all areas of development.

Further studies, that should consider many factors involved in the recovery process, are necessary.

Keywords: autism, early intervention, therapy.

INTRODUCTION

Autism is a neuro-developmental disorder that affects people for life, described in DSM-5 (Diagnostic and Statistical Manual of Mental Disorders) as having two diagnostic criteria: 1) deficit in social communication and 2) restrictive and repetitive behaviors, both affecting their daily lives[1]. Over the last years there has been a significant increase in autism incidence, from 1/2500 children in 1985 to 1/54 children in 2020 in USA[2]. Several prevalence studies conducted in Europe indicate rates reaching or exceeding 1% (1,2% in Iceland, for example)[3]. Other studies conducted in non-European regions have higher prevalence estimates, reaching to 2.64% in South Korea[4]. It is estimated that worldwide about one in 100 children has autism[5].

Autism etiology is not yet fully known. Genetic, gastric, obstetrical, metabolic, and toxic factors have been studied and associated to a greater or lesser extent with an increased risk of autism, but a unitary cause and, implicitly, a specific treatment have not been discovered yet. A number of specialists recommended a specific psychiatric medication (Risperidone, Aripiprazole), but it addresses specific symptoms (deviant behaviors, hyperkinetism, self or hetero aggressiveness) and not autism itself[6].

Behavioral therapy sessions, adapted to the individual and his needs, conducted by specialists in one-on-one sessions or in very small groups, seem to be the only ones that bring significant progress on all areas of development in the case of those affected. Currently, there are several types of therapies, which are addressed either in general, to all behavioral areas, or are targeted towards a certain symptomatology or deficit. The most common are therapies based on Applied Behavior Analysis. Some of the therapies based or derived from Applied Behavior Analysis and applied worldwide to children with autism are: Incidental learning, Enhanced milieu teaching, Mutual imitation, Impact Project, JASPER (Joint Attention, Symbolic Play, Engagement & Regulation), SCERTS (Social Communication / Emotional Regulation / Transactional Support), Pivotal Response Treatment, ESDM (Early Start Denver Model), etc.[7]. Another usual intervention for autistic kids is sensory integration. Developed by occupational therapists, sensory integration therapy is an integral part of occupational therapy but can also be applied separately as stand-alone therapy. This intervention addresses the person and his behaviors through the prism of the nervous system's ability to perceive and analyze information in the environment and to develop an adequate adaptive response, according to the theory of sensory integration, developed by A. Jean Ayres in the 1970s. Also, repetitive behaviors and autistic mannerisms have decreased, which suggests that these interventions have a direct impact on the central symptoms of autistic spectrum disorder[8].

A series of studies conducted to investigate the effectiveness of the therapies and interventions implemented in therapy centers around the world, show that intensive and early interventions based on applied behavioral analysis bring important improvements to the lives of children with autism, especially in the areas of cognitive, communication, adaptation and repetitive behaviors[9]. Studies in the scientific literature show that the age at which children receive help for psycho-social and motor recovery through these behavioral therapies is very important[10]. Recent studies have found that interventions implemented before age 4 (*e.g.*, 12–48 months) are associated with significant progress in cognition, language, adaptive and social behavior[11]. In a study conducted on 131 autistic children, aged between 1.2–5 years, was shown that 65% of children diagnosed before 2.5 years of age exhibited improvements in Autism Diagnostic Observation Schedule in contrast to only 23% of the children diagnosed after this age[12].

Early intervention is closely related to early diagnosis. However, in Europe, although tests allow diagnosis even before 24 months, the average age of diagnosis is 3.5 years with great variability between countries. In a study conducted on 18 countries in Europe, the average age was 42.16 months (standard deviation SD = 13.42). In Romania, the average age for diagnosis was 37.55 months (standard deviation SD = 11.23)[13]. The causes of the delay in diagnosis and the beginning of the therapeutic interventions can be very diverse and are not related only to a lack of testing and diagnostic services. There are some socio-demographic characteristics that influence the process, such as the place of residence of the child, the socio-economic level of the family, or structural limitations of the services that give rise to long waits for the child to be diagnosed[14]. In Romania, after the diagnosis, children do not enter in a therapeutic program automatically, therefore sometimes there is an important delay between the moment of diagnostic and the moment of therapy starting. And, due to the costs of therapy and transport, some of the children receive therapy later or, unfortunately, never.

The purpose of this research is to study how the age (at which children receive help through therapy) influences the subsequent progress on several areas of development, on their way to recovery.

MATERIAL AND METHODS

30 children with ASD from a therapy center in Peretu (Teleorman county) aged between 3.5 and 17 years (average age 7.45 years, with a standard deviation of 3.58) were included in the study group. The children received 6-8 hours of therapy weekly (on average 8.2 hours, with a standard deviation of 1.21), for 2 years and the progress was evidenced by the application of the ABAS II test (The Adaptive Behavior Assessment System–Second Edition) at the beginning and end of the therapy.

The ABAS–II test provides a comprehensive norm-referenced assessment of the adaptive skills of individuals ages from birth to 89 years. The test can be used to diagnose and classify disabilities and disorders, identify an individual's strengths and limitations, and to document and monitor the individual's performance over Time[15]. Composite results for General Adaptive Composite (GAC), Conceptual (which includes communication, functional and academic skills and self-direction), Social (which includes social skills and leisure time) and Practical (which includes resources use, life at home and at school, self-care and safety in activities) were calculated and analyzed statistically.

Also, data were collected about the children’s gender, the residential home (rural/urban), the age of diagnosis and the age at which they started the therapy sessions.

The children accepted in the study group were diagnosed with autism according to the legislation in force at the time of diagnosis (infantile autism, Asperger's syndrome, atypical autism etc.) by a psychiatrist from the medical health system before entering the study (eligibility criterion).

During the research, all 30 children received therapy in the same center, with the same specialists and consisting in a combination of ABA based therapies and sensory integration therapy. According to the recommended therapeutic standards for autism, the therapy was adapted to each individual according to his needs and covered all areas of development (cognitive, social, self-care, sensory, motor, academic etc.).

RESULTS

Our sample consists of 30 children, of which 23 (76.67%) are boys and 7 (23.33%) are girls. The sex ratio is 3.28 and supports the data found in specialized studies in which the incidence of autism is in a ratio of 4:1 boys to girls[16]. 20 of them (66.67%) come from urban areas (the cities near the center where the research is carried out) and 10 (33.33%) from rural areas.

In *Table 1* are presented the statistical data about the age of the child at the time of inclusion in the research sample, the age at which he was diagnosed by a psychiatrist and the age at which he started the recovery therapy. Some of the children had done other types of therapy in other institutions before the present research, so we considered the age declared by the parents at which the children started any kind of therapy.

After applying the ABAS II test at the acceptance to the sample, the composite scores for Conceptual, Social, Practical and GAC were calculated. After the two years of therapy, the same test was applied and the differences were calculated and are represented in Figs. 1, 2, 3 and 4.

As can be seen, most of the children have made important progress (the average increase compared to the initial test is 15.5). However, 7 of the children registered a regress in this adaptive domain, the factors that led to this situation remaining to be analyzed in subsequent studies. The maximum increase is 44 points, the maximum regression is 19 points.

Table 1

Statistical data on the ages of the children in the studied group

Age/years	MIN	MAX	Average	Median	Standard deviation
Age at research admission (2018)	3.5	17	7.45	6	3.58
Age at diagnosis	2	6	2.98	2.5	0.96
Age at therapy starting	2	12	4.05	3.25	2.39

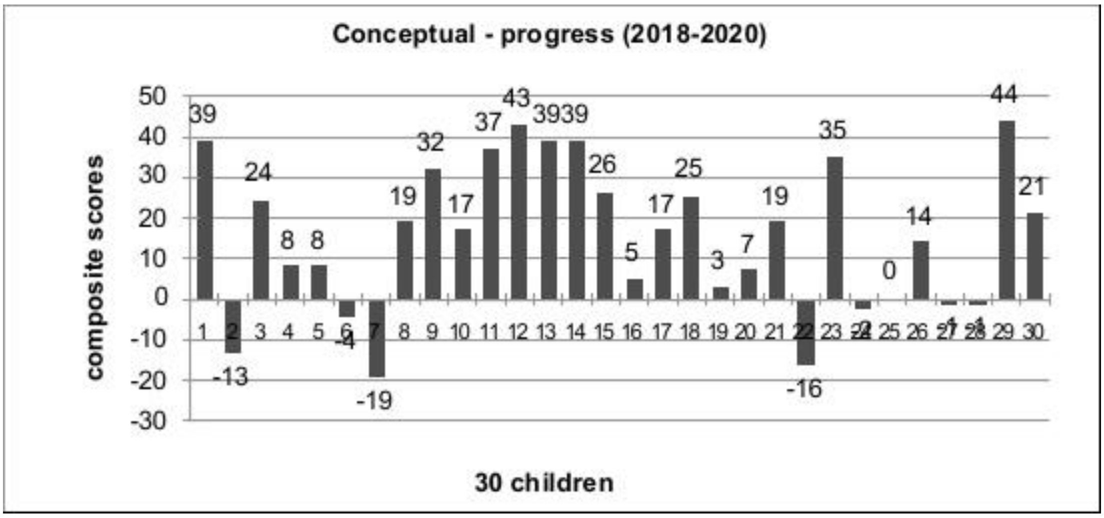

Figure 1. Composite Scores, Conceptual adaptive domain (30 children).

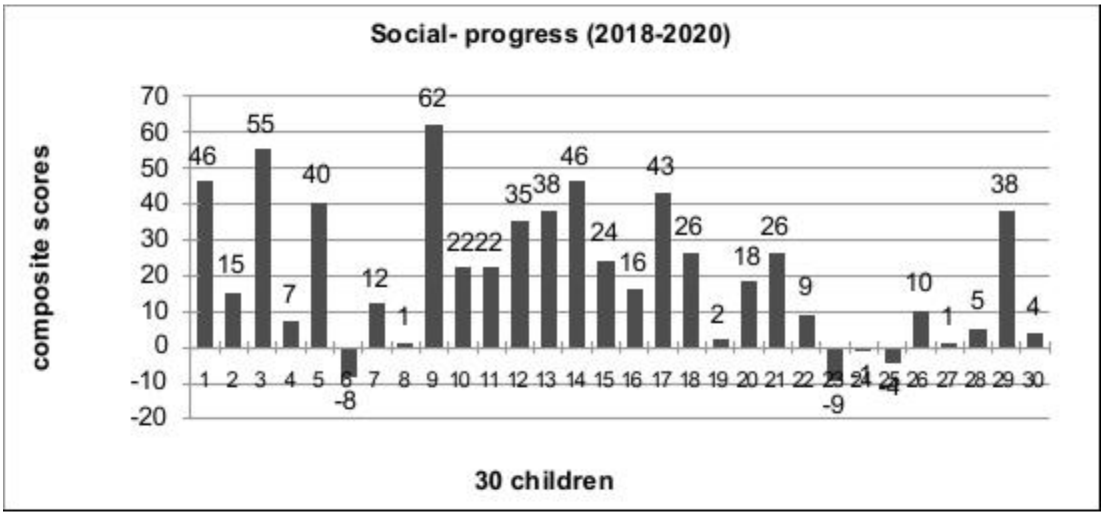

Figure 2. Composite Scores, Social adaptive domain (30 children).

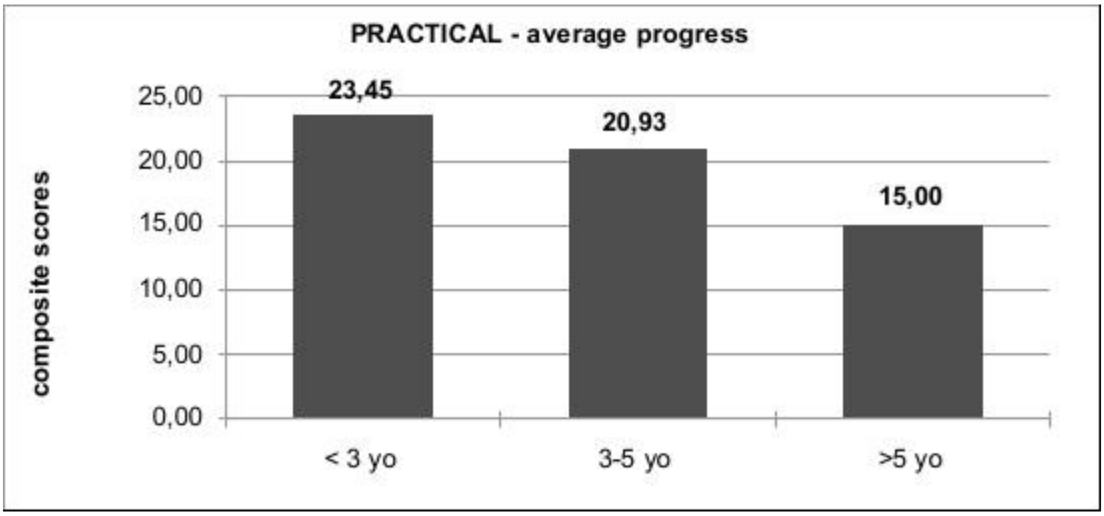

Figure 3. Composite scores, Practical adaptive domain.

As for the progress made in the Social adaptive domain, the average increase in the two years for the entire sample is 20.03, with a maximum of 62 and a minimum of –9. 4 children experienced slight regress, while the remaining 26 made uneven progress.

In adaptive domain Practical, the average progress after two years for the entire sample is 20.87, with a minimum of –8 and a maximum of 60.

5 of the children recorded regress in this area (with values between –1 and –8) and the other 25 registered progress with values between 0 and 60 points.

In terms of GAC scores, the average progress is 19.77 with a minimum of –7 and a maximum of 54. For the entire research sample, after two years of therapy, the overall GAC scores have increased, which means that the overall abilities of the children have also increased.

When we grouped the children into categories according to the age at which they started therapy, the scores on the three adaptive domains showed a correlation between the level of progress and age. The age categories in which they were grouped are: under 3 years old, between 3 and 5 years old and over 5 years old.

Studies show that starting therapy before the age of 4 is decisive in the further evolution of children, but taking into account the fact that the average age of diagnosis in Romania is 3.5 years, we considered that a truly early intervention would mean an intervention started before the age of 3 years. The results are shown in Figs. 5, 6 and 7.

For “under 3 years old” category, the average progress is 20.82, higher than for the other age categories, which are 12 and 13.60 respectively, (the differences being statistically significant, p=0.19, respectively p=0.68).

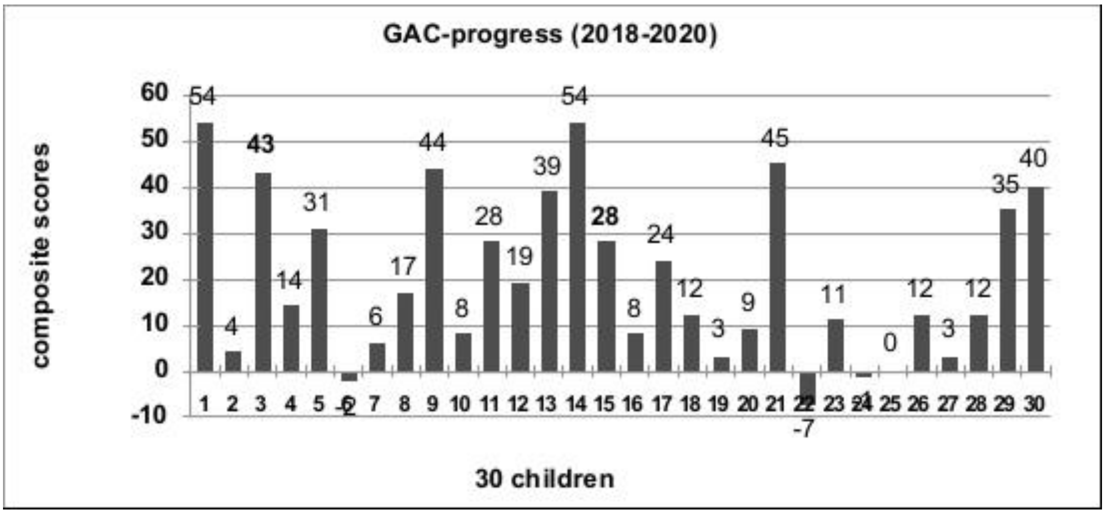

Figure 4. Progress of GAC (General Adaptive Composite).

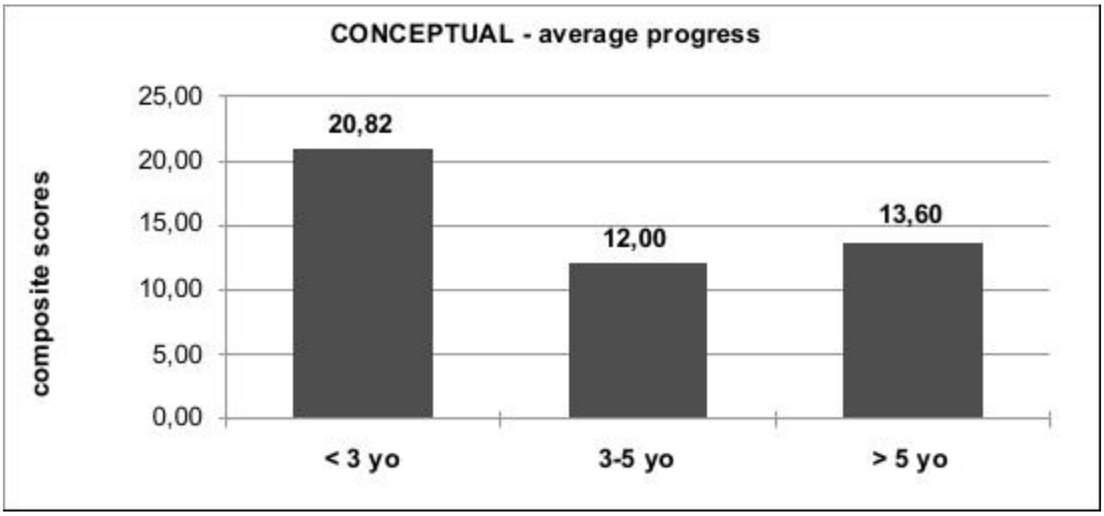

Figure 5. Average progress of composite scores in the Conceptual adaptive domain, for the entire group, depending on the age at which they started therapy.

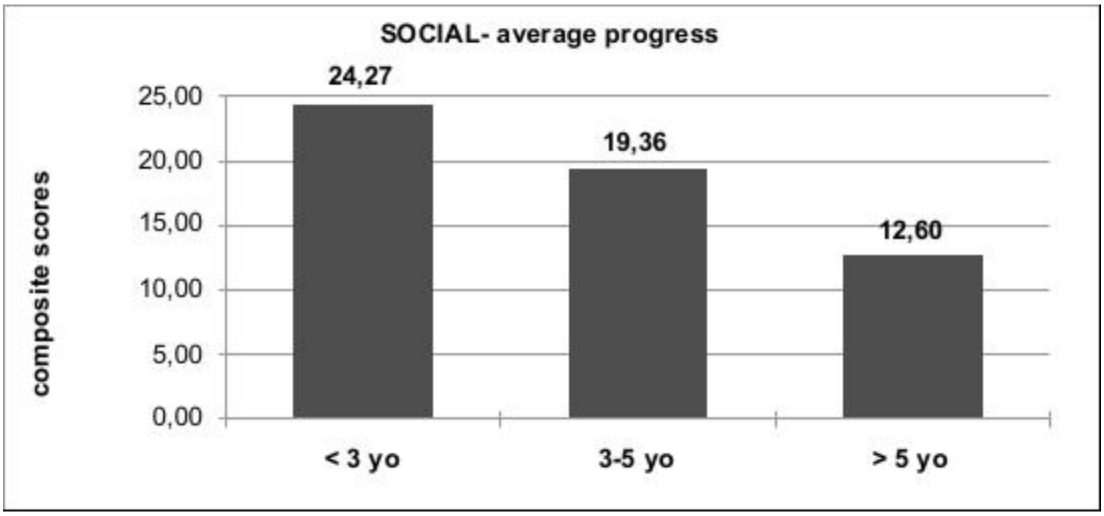

Figure 6. Social adaptive domain, average progress of composite scores, for the entire group, depending on the age at which they started therapy.

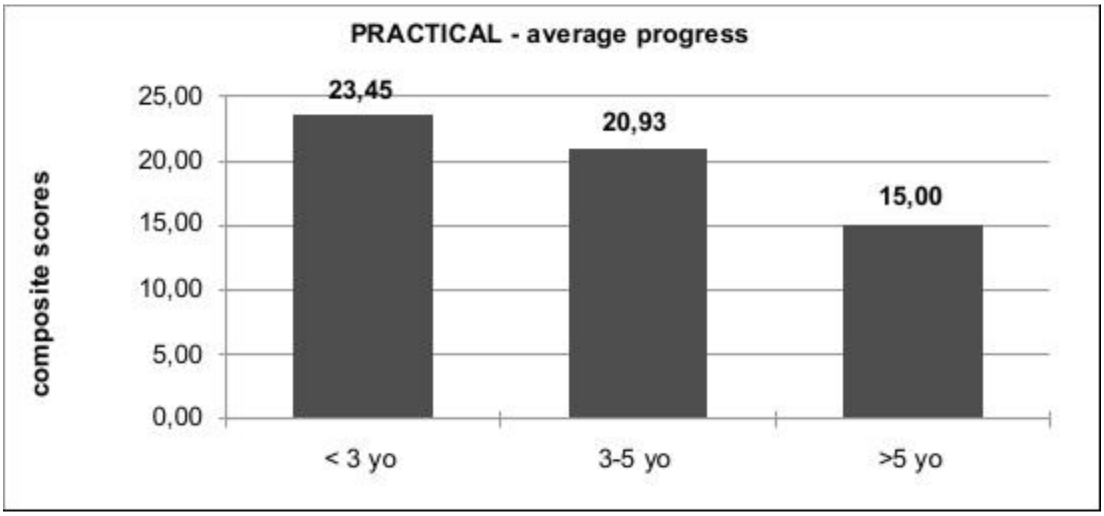

Figure 7. Practical adaptive domain, average progress of composite scores for the entire group, depending on the age at which they started.

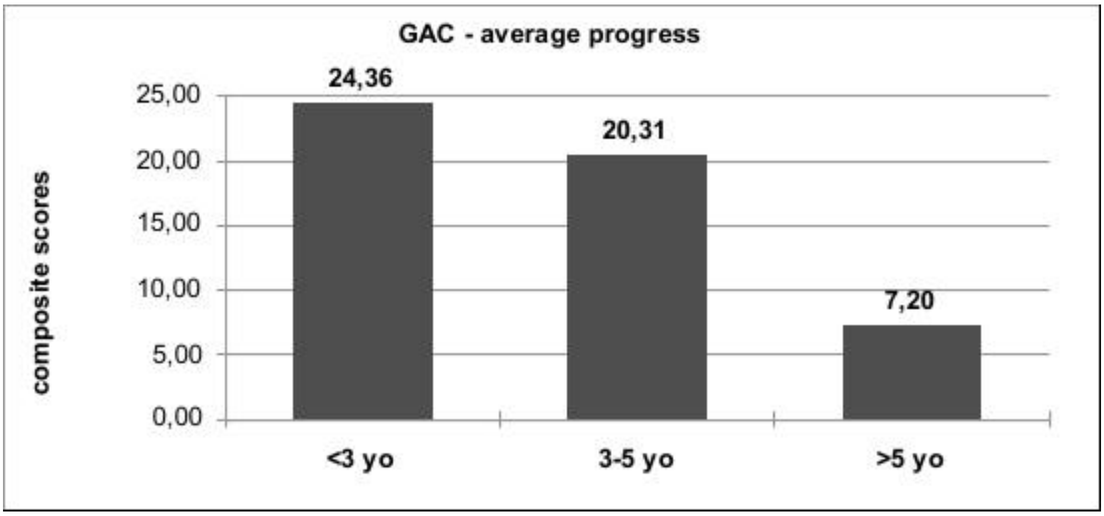

Figure 8. Average progress of GAC composite scores, for the entire group, depending on the age at which they started therapy.

Children who started therapy under the age of 3 years registered higher progress on average (24.27 compared to 19.36, respectively 12.60 in the other age categories) in Social area, the differences being statistically significant, p=0.20 and 0.69 respectively.

Statistically significant differences between the scores obtained by the children who started therapy before the age of 3 and those who started therapy between 3 and 5 years or over the age of 5 years were also recorded for the area Practical (p=0.65, respectively, 0.72)

The averages of the GAC scores depending on the age at which the therapy was started are also in accordance with the previous results, the average progress in the category under 3 years being significantly higher than in the case of the other two age categories (with p=0.51, respectively p=0.14).

CONCLUSIONS

After 2 years of therapy and monitoring, on average, the studied group of 30 children diagnosed with autism achieved progress in all areas of development. The average increase in the composite scores on the Conceptual, Social and Practical adaptive domains were, respectively, 15.5, 20.03 and 20.87. The increase in scores for the general adaptive domain (GAC) was 19.77.

Regarding age, children who started therapy before the age of 3 obtained significantly higher mean composite scores on all adaptive domains, compared to children in the other age groups.

In the Conceptual domain, children who began therapy at ages older than 5 obtained slightly higher mean scores than those who began therapy between 3 and 5 years of age (13.60 *vs.* 12.00).

The general progress on adaptive domains (GAC) shows an increase of 24.36 points in the age category under 3 years, higher than in the other two age categories (between 3 and 5 years, respectively over 5 years). The overall progress of those who started therapy at ages older than 5 years is lower, of only 7.20 points.

The differences being statistically significant, we can conclude that early therapeutic intervention at ages younger than 3 years increases the chances of recovery in all areas of development, especially in the social and practical domains.

The factors that determined the regression of some of the children in the studied group are diverse, they are generally of a social and family nature and will be analyzed in subsequent articles.

Of course, more in-depth studies on the contribution of the family and the impact of its involvement in the recovery of children with autism are necessary. And it is also necessary to identify and analyze other factors that influence the evolution of children with autism on their way to recovery and a fulfilled life lived fully integrated in society.

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