THE VALUE OF PHYSIOTHERAPY IN DEVELOPMENTAL COORDINATION DISORDER RECOVERY IN CHILDHOOD

Elena Buhociu

Spiru Haret University, 24 Berceni Road
Bucharest, Romania

Abstract

Primary coordination disorders affect the child since birth. They are generally accompanied by cerebral palsy, however, several degrees of coordination disorder have been identified. This is why the condition is often underdiagnosed. The disorders have the generic name of dyspraxia.

Dyspraxia is defined by the inability to perform coordinated movements as a result of brain damage.

Development dyspraxia, during the first childhood, is considered "a lack of maturity of motor commands and movements". They are insecure, slow, inaccurate.

For a long time, it was generally accepted that the difficulties encountered by some children in maintaining their posture during the first year of life, and then in the acquisition and development of walking and gestures would be due to a "clumsiness" that would disappear as aging progresses.

But in recent years, it has come to the conclusion that the affection is real, although the causes are not yet specified. This disorder affects about 6-10% of children, most of them male.

Through this paper we aim to investigate the possibility of diminishing dyspraxia's effects by applying individualized programs of physyotherapy.

Physyotherapy in this area is very useful. While the affection cannot be treated, both by itself and associated (cu ce anume?) it ameliorate its effects and improve the quality of life. Physical therapy prevents the development of secondary deficiencies and can be applied and adapted to any age. Especially in children, it can be easily combined with in games (basic activity for this age) so that the child will be attracted to the exercises and activities.

Keywords*: coordination, dyspraxia, physiotherapy*

Backround

Primary coordination disorders affect the child since birth. They are generally accompanied by cerebral palsy [1], however, several degrees of coordination disorder have been identified. This is why the condition is often underdiagnosed. These disorders have the generic name of dyspraxia.

Dyspraxia is defined by the inability to perform coordinated movements as a result of brain damage [2].

Development dyspraxia during the first childhood is considered a "lack of maturity of motor commands and movements" [3]. They are insecure, slow and inaccurate.

For a long time, it was thought that the difficulty encountered by some children in maintaining their posture during the first year of life, along with the acquisition and development of walking and gestures, would be due to a "clumsiness" that could disappear as aging progresses.

Throughout history, several neurological diseases have been diagnosed as dyspraxia, namely peripheral neuromuscular disorders such as Becker's muscular dystrophy, myotonic dystrophy, types of hereditary motor and sensory neuropathy I and II (HMSN), congenital myotonia (autosomal recessive) and congenital myasthenia; central nervous system disorders: cerebral palsy, cerebral tumors

(slow growth in posterior fossa), Hallervorden-Spatz syndrome, familial benign core, epilepsy (myoclonus, asthma, asthma, Landau-Kleffner syndrome), central nervous system disorders and peripheral disorders: Friedreich's ataxia and Pelizaeus-Merzbacher disease, as well as other disorders: Ehlers-Danlos syndrome and GM1 gangliosidosis. The diagnosis will be final once all the disorders listed above have been taken into account and excluded [4].

In recent years, it has come to the conclusion that the disorder is real, although the causes are not yet specified. This disorder affects about 6-10% of children, most of them male.

Due to the immaturity of the development of motor neurons, the systems for processing brain information are not fully developed and messages are not properly transmitted from the brain to the effector organs [5]. This disorder does not manifest itself only during childhood. It continues and can affect the social and professional life of the adolescent or even the adult.

The manifestations of dyspraxia include, in addition to imprecision and slowness of movements, more serious disorders of perception, verbal expression and even thinking [6].

Because of the immaturity of neuronal development, the child appears to be less developed than others of the same age, easily stumbles, hits or falls over objects. The affected child therefore presents an equilibrium disorder and, due to the obvious motor dysfunction, a decrease in muscle strength for all muscle groups.

For preschool children, dyspraxia can be recognized by the child's difficulty in acquiring age-appropriate motor skills [7]. It will take longer to:

- to sustain their head, to roll, to gain sedentary-static, orthostatic and walking positions;
- run, jump, play, hit or kick the ball;
- will have difficulty speaking and will pronounce with difficulty certain sounds (palatal consonants like T and D, for example);
- will have difficulty eating;
- will have issues in forming a sleep routine;
- will have difficulty in making or keeping friends because of the motor deficit, which always puts it in inferiority to children of the same age;
- will have difficulty in understanding and using concepts such as up / down, above / below, forward / back etc.;
- will have difficulty in climbing and descending stairs;
- will learn slower to dress and to tie their shoes by themselves;
- acquire innate motor skills, as they grow older and older, the child will have to "learn" every motor act;
- will have difficulty gripping objects, their grips are unsafe and often ineffective;
- will encounter difficulties in pattern recognition and sorting games;
- their drawings will be schematic and immature [8,9].
- will frequently experience attention deficit and anxiety crises, manifested by anger or crying.

School-aged children [10] have the same difficulties identified in preschoolers, but they can manifest themselves more intensely because of the higher requirements of the school environment:

- the children avoid physical activities and group games;
- has low class performance, but significantly better they learn alone at their own pace;
- responds undifferentiated to stimuli of different types and intensities, and the attention span is short;
- may have difficulty in mathematical calculations, but also in writing stories;
- has difficulty copying from the board;
- writing is difficult and immature;
- memory is affected and has trouble following instructions;
- generally lacking organizational capacity.

Physical therapy is very useful in this area. It can not treat affection, but by its own

and associated means it can ammerlioarate the manifestations and improve the quality of life. Another benefit of kinetotherapy is the prevention of secondary deficiencies and also the fact that it can be applied and adapted to any age. Especially for children, it can be easily combined with the game (basic activity of this age) so that the child will be attracted to exercises and activities [11].

Treatment strategies for coordination development disorder are diverse and their effectiveness has been proven. Approaches are grouped into two categories, an approach is geared towards the motor deficit and the other is geared towards learning task-specific functional abilities, i.e. cognitive motor approaches. The first approach focuses on addressing underlying processing deficits and facilitating development. The objectives of this approach target neural structures, such as the cerebellum or sensory processes, based on the hypothesis of a direct link between the underlying processes of development and functional performance.

The second approach is based on cognitive motor interventions and specific tasks. This approach focuses on teaching the child a certain task that causes them difficulties. The hypothesis of this approach is that performance is the result of learning and learning is more effective when the child learns a "targeted" task. The task can be divided into several components or stages, which are taught separately and then put together to complete the task as a whole [12].

Hypotheses

Physical therapy, along with its associated means, helps alleviate the developmental disorder manifestations in children, improving the quality of life for both the child and the family.

The early diagnosis and implementation of kinetic programs allow children to socially integrate and attend schooling stages as close as possible to their healthy counterparts.

Method

The case study was of a 6-year-old male child who was diagnosed with developmental dyspraxia based on neurological and psychomotor complex tests of the TOMI and MABC type (general coordination test).

A three-week program of weekly kinetotherapy sessions, lasting 40 to 60 minutes each, was held over a six-months period. In the beginning, the exercises took place at the child's home, in order to maintain a familiar environment and to gain his trust. About two months later, the exercises could take place in a physiotherapy clinic in Bucharest.

Before starting, several goals were established.

Children with developmental coordination disorders present impediments in coordination, balance and muscle strength, therefore body position and proprioception will be affected. The objectives of kinetotherapy are to prevent or improve these positions, trying to ammeliorate the child's life. In this field, kinetotherapy will focus on preventing vicious positions, increasing muscle strength, coordination, control and balance [13].

The objectives of kinetotherapy were:

- improving motor control performance by increasing the coordination capacity;
- the development of fine and forceful grip;
- formation of correct bodily reflex of static and dynamic attitude;
- improving the static and dynamic balance;
- Achieving the harmonious physical body development and the relationship between the different body segments;
- Increasing segmental and global muscle strength.

The kinetic program throughout the course of the day was accompanied by exercise at home, under parental supervision, which gave a plus in recovery. Through these exercises, skills have been practiced on a regular basis, new ones have been acquired, which has increased the child's

self-confidence and increased relational capabilities.

During the kinetic program, a relationship based on trust between the patient and the physical therapist has been created so that the patient has been able to express the difficulties they encounter so they can be resolved.

Exercises have been presented in the form of games adapted to each patient's needs, so the sessions have created a fun atmosphere where the patient has been encouraged to perform the exercises, to learn from them and actively participate in them.

The patient's final assessment was made by comparison with his onset state and his cognitive performance.

Results

Through exercise, all types of grips have been improved. They have become firmer, more precise and have led to progress in other self-service activities:

- dressing,
- grooming,
- feeding,
- use of the toilet etc.

They have also improved in school activities:

- writing,
- manipulation of various objects (toys),
- ball games,
- orthostatism and walking etc.

As a result of improving motor skills, the way the child was perceived by the community also changed. He was more easily accepted by other children in joint activities and group games, thus improving the child's image of himself.

Conclusions

1. Children with developmental disorder of coordination may associate other types of dysfunction; dyspraxia is also often associated with other disorders such as: autism spectrum disorders, ADHD, dysarthria, intellectual disability, Down syndrome, Pierre Robin syndrome, dyslexia and dysgraphia.

2. Physical therapy is effective not only through the motor learning it performs, but also by stimulating tactile and kinesthetic receptors, which contribute to the strengthening of the motor regimen.

3. The kinetotherapy programs was focused on the practice of elementary movements, which were learned by repetition, but also on the realization of ample movements that took place over the entire length of the mobility course.

4. Physical therapy in this field has a positive impact both mechanically and emotionally. Throughout the program, the child began to gain self-confidence, which led to the desire to try new exercises and more effective cooperation. That is why we can say that the assumptions of the work have been confirmed.

References

[1]. Căciulan, E. (2012) *Tulburările de coordonare centrală şi kinetoterapia*. in http://www.saptamanamedicala.ro/articole/ Tulburarile-de-coordonare-centrala-si-kinetoterapia.html// 12:37, Miercuri 18 Iulie 2012;

[2]. Bănică, L. (2009) *Psihomotricitate, psihopatologie, psihoterapie. Elemente aplicative în kinetoterapie*. București: Editura Fundației *România de Mâine*;

[3]. https://dexonline.ro/definitie/dispraxie accessed at 02.05. 2017;

[4]. Martini, F. H., E. F. Bartholomew, E. F. (1999). Structure and Function of the Human Body. Upper Saddle River, NJ: Prentice Hall:

[5].http://www.kinetikmed.com/Tratamente-afectiuni/Tratamente-afectiuni-localizare-diversa/tratament-leziuni-neuromusculare.html//accessed at 02.05. 2017;

[6]. http://www.biologyreference.com/Oc-Ph/Peripheral-Nervous-System.html#ixzz4wh3aKe8O//accessed at 2.05.2017;

[7].http://www.sfatulmedicului.ro/Crestere a-si-dezvoltarea-copiilor/dispraxia_10413// accessed at 02.05.2017;

[8]. Arnheim, D.D., Sinclair, W.A. (1990) *The Clumsy Child: A Programme of Motor Therapy 2nd Edition.* Mosby; 2nd edition. ISBN-10: 0801603102;

[9]. Barnett, A.L., Henderson, S.E. (1996) *An annotated bibliography of studies using the tomi/movement abc*: 1984-1996. The Psychological Corporation Harcourt Brace & Company, Publishers in http://www.pearsonclinical.co.uk/Psychology/ChildCognitionNeuropsychologyandLanguage/ChildPerceptionandVisuomotorAbilities/MABC-2/Resources/movement-abc-bibliography.pdf accesat la 05.10.2017;

[10].https://www.google.ro/search?q=dyspraxia+definition&oq=Dispraxia+def&aqs=chrome.1.69i57j0l5.10793j0j7&sourceid=chrome&ie=UTF-8 accesat la 02.10 2017;

[11]. Dyspraxia at a glance…What is Dyspraxia? (2017) In https://dyspraxiafoundation.org.uk/about-dyspraxia/dyspraxia-glance/ Dyspraxia Foundation, 8 West Alley, Hitchin, Herts, SG5 1EG;

[12].http://www.movementmattersuk.org/dcd-dyspraxia-adhd-spld/developmental-disorders-documentation.aspx accesat la 05.05.2017;

[13].Sabău E., Gevat C., Niculescu G., Bănica L., Jianu A. (2011) *Consideration regarding the perceptual motor activity of children with mental disability*, Journal of Phisical Education and Sport Science, Selcuk University, p. 119-125.