MOTION THERAPY AND ITS IMPACT ON THE STATIC BALANCE OF A CHILD WITH AUTISM

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Annotation. Latest American research shows that the scale of autism occurrence is steadily growing. Motion therapy is an importance link in a chain of treatment of person with autism. Increased kinetic activity results in human organism a new status of functional balance, characterised by smaller sensitivity in reacting to unfavourable stimuli. The paper presents effects of motion therapy carried out in a gymnasium and in water. It was an attempt to answer the question if the motion therapy influences shaping of static balance as a co-ordination component as a result of land and underwater exercises. The research was carried out on a 11-year-old boy. The therapy lasted for six months. The applied method was stimulated serial repetitions and a tensometric platform for identification of changes in static balance. It was noticed that as a result of exercises, the boy's static balance improved. The difference between maximum and minimum inclination in the left-right directions amounted to 10.13; front-back - 9.88 respectively. Similar values were found in standard inclinations: left-right - 0.595; front - back - 0.881 respectively. Targeted motion therapy influences improvement of static balance as a component of co-ordination necessary for proper functioning of a child with autism.
Key words: autism, motion therapy, static balance.
Анотація. Збігнєв Сзот, Томаш Сзот. Терапія руху і її вплив на статичний баланс дитини з аутизмом. Останнє американське дослідження показує, що масштаб виникнення аутизма стійко росте. Терапія руху - зв'язок важливості в ланцюзі лікування людини з аутизмом. Збільшена кінетична діяльність у людському організмі виявляє новий статус функціонального балансу, характеризованого меншою чутливістю в реакції на несприятливі стимули. Стаття представляє які ефекти має рухова терапія, що виконуються в гімнастичних залах і у воді. Це була спроба відповістити на запитання про формування впливу терапії руху статичного балансу як компонента здійснення координації на землі й під водою. Дослідження було виконано 11-літнім хлопчиком. Терапія тривала протягом шести місяців. Зауважувалося, що в результаті вправ, статичний баланс хлопчика покращився. Розходження між максимальною й мінімальною схильністю в напрямках ліво-право становила 10.13; передня задня частина - 9.88. Подібні цінності були знайдені в стандартних нахилах: ліво-право - 0.595; уперед - назад - 0.881. Така терапія руху впливає на вдосконалення статичного балансу як компоненту координації, необхідний для належного функціонування дитини з аутизмом.
Ключові слова: аутизм, рухова терапія, статичний баланс.
Аннотация. Збигниев Сзот, Томаш Сзот. Терапия движения и ее воздействие на статический баланс ребенка с аутизмом. Последнее американское исследование показывает, что масштаб возникновения аутизма устойчиво растет. Терапия движения - связь важности в цепи лечения человека с аутизмом. Увеличенная кинетическая деятельность в человеческом организме являет новый статус функционального баланса, характеризованного меньшей чувствительностью в реакции на неблагоприятные стимулы. Статья представляет какие эффекты появляются в терапии движения, которые выполняются в гимнастических залах и в воде. Это была попытка ответить на вопрос о формировании влияния терапии движения статического баланса как компонента осуществления координации на земле и под водой. Исследование было выполнено 11-летним мальчике. Терапия продолжалась в течение шести месяцев. Замечалось, что в результате упражнений, статический баланс мальчика улучшился. Различие между максимальной и минимальной склонностью в направлениях лево-право составляло 10.13; передняя задняя часть - 9.88. Подобные ценности были найдены в стандартных наклонах: лево-право - 0.595; вперед - назад - 0.881. Такая терапия движения влияет на усовершенствование статического баланса как компонент координации, необходимый для надлежащего функционирования ребенка с аутизмом.
Ключевые слова: аутизм, двигательная терапия, статический баланс.

The first attempts to apply motion therapy in Poland were made in 1991 at the Centre of Therapeutic Aid for People with Autism in Gdańsk. The scientific research resulted in production of tens of papers, including a few books [6, 10]. The issue was also discussed during scientific conferences [3, 4, 5, 7].
The latest American research shows that the scale of autism occurrence is steadily growing. Motion therapy is an important link in a chain of treatment of a person with autism.

The research carried out in Gdańsk also proves that 95% of children with autism showed significant differences in static balance as compared to healthy ones [9]. Since static balance is an important component of motion coordination, allowing to master numerous activities (locomotion, independence, communication at home), therefore the paper tries to answer a question whether physical exercises can develop static balance in a child with autism.

The paper tries to show the impact of targeted and intensive exercises on developing static balance of a person with autism as one of the motion coordination therapy.

Material and methodology

A boy aged 11, diagnosed in San Diego through B. Rimbland's Form E2 test was an object of research. The boy had a healthy, well-off family background. The method of stimulated serial repetitions (SSP) was applied in order to prove the impact of motion exercises on developing static balance.

To assess the level of static balance, a statokinesiometric platform was used. The platform is used for graphic registration of a displacement of an upright-positioned person in time and space, dependant on the existing difference in tension of individual groups of muscles. The deflection in four directions, i.e. forwards and backwards, and to the right and left was registered as components y+ and y-, and x+ and x- respectively [2].

The boy received a three-year-long motion therapy, carried out both at home and at the Academy of Physical Education and Sports. On 15th December 2001 diagnostic tests were carried out (Trace 1) after which a motion programme using the method of stimulated serial repetitive exercises was performed. After five months the second series of tests were held (Trace 2). Then, the boy was training at home together with his parents, who carried out motion exercise programme in a form of games and tasks (90-minute walking and running in the open area, twice a week, and in winter - 3 hours of skiing every day). From 1st January till 31 May 2003 the boy was practicing very intensive motion curriculum in a fully equipped gym. During that time the boy had 20 classes, thirty minutes each. The programme focused on locomotive, jumping, balance, dexterity, and casting exercises (cf. Tab. 1).

Table 1.

Types of exercises performed in a gym by a child with autism, P. S. before the swimming course in the period between 1st Jan. - 30th Apr. 2004

Groups of exercises	Name of the exercise	Total within 3 months (time & number of repetitions)
Locomotive	Running with both arms doing circulatory movements forwards and backwards, alternate circulatory movements, step forward with the other foot's shuffle, running backwards	70 minutes
Jumping	Skipping over long ribbon, jumping down to a sponge mattress from various heights, jumping on the trampoline.	288 repetitions 61 minutes
Balance	Walking along the bench, balance beam on various height.	114 repetitions
Dexterity	Front somersault, rolling over, walking up and down the ladder, obstacle course	240 repetitions
Casting	Casting a tennis ball at a target with one or both hands (a bucket or a target)	178 repetitions
Others	Hanging down from the ladder backwards, touching the chest with bent knees, sitting up from the lying position to a squatting position, crouching and toe-climbing by the ladder.	496 repetitions

The table shows that the boy was submitted to many sets of exercises which specifically affected his motor skills. All in all, in the period in question, the boy performed a total of 1,316 repetitive exercises. Just after his exercises in the gym, the boy practiced in the swimming pool performing 297 various movements, and swimming additionally 3,100 metres (Fig. 1). After completion of these exercises, the third examination of static balance was performed (Trace 3). The test was carried out at the Physical Effort Laboratory of Gdańsk Sports Academy.

Fig. 1 Distance 3,100m

Fig. 2 presents results achieved by the boy. The data show that after the whole series of exercises PS improved his static balance in all its parameters. The difference between maximum and minimum inclination in the left-right directions amounted to 10.13 (13.8 - 3.67); front-back 9.88 (13.88 - 4.0) respectively. Similar values were found in standard inclinations: left-right 0.595 (1.476 - 0.881); front-back 0.881 (1.945 - 1.064) respectively.

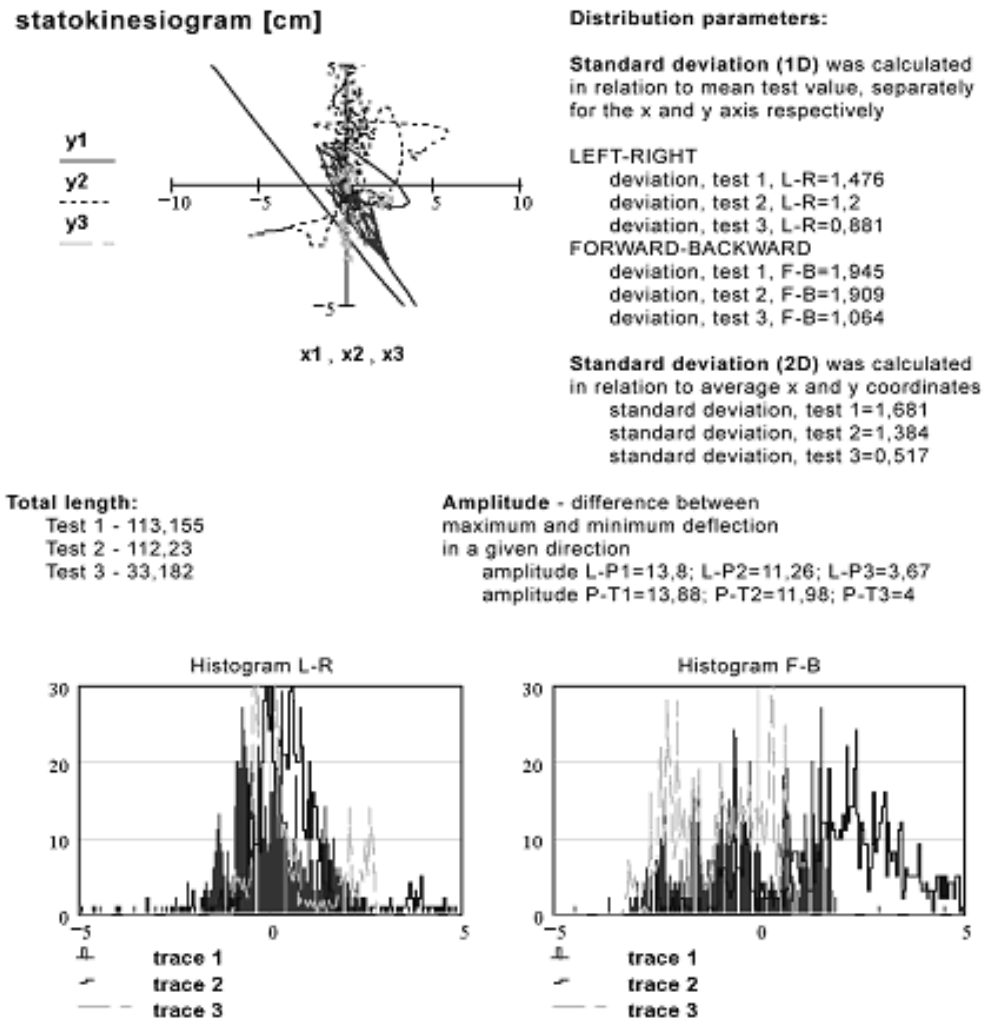

Fig. 2. Results of tests of a person with autism P.S. before and after kinetic therapy

The test was carried out at the Physical Effort Laboratory of Gdańsk Sports Academy.
Diagnostic test before therapy - test 1 (15.12.2001 - in red), P_1, T_1, L_1, P_1
Diagnostic test after therapy - test 2 (18.05.2002 - in blue), P_2, T_2, L_2, P_2
Diagnostic test after therapy - test 3 (31.05.2004 - in green), P_3, T_3, L_3, P_3

Discussion

Maintaining balance as a significant component of motion coordination that allows to master a number of locomotive operations necessary in everyday life is an important element of functioning of a person with autism. Some scholars believe that its aetiology is related to the vestibular system [1] where receptors of balance are located. People with autism also show ataxia taking form of poor kinetic coordination, with one of its elements being poor static balance. The obtained results are convergent to the research conducted before [8] and later on balance of children with autism or with autistic elements, ands show the impact of motion exercises on the development of static balance [11]

Conclusions

Targeted motion therapy influences improvement of static balance as a component of coordination necessary for proper functioning of a child with autism.

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