

Hippotherapy – an effective multi-profile treatment?

Hipoterapia – skuteczna terapia wieloprofilowa?

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ABSTRACT

INTRODUCTION: Hippotherapy is a form of psychomotor therapy aided by a horse. Aim of the paper: The aim of the paper is to characterize hippotherapy as an effective method supporting rehabilitation of disabled people in the bio-psycho-social area. The analysis is based on a review of the literature and previous studies of this form of therapy.

MATERIAL AND METHODS: The material was gathered using the ALEPH integrated library system. The literature was obtained from different databases such as PubMed and Medline.

RESULTS: The research carried out to date indicates the usefulness of hippotherapy in improving the condition of patients with Cerebral Palsy (CP). The obtained results show significantly better results of rehabilitation for children with CP treated with combination therapy using PNF techniques and hippotherapy. The efficacy of hippotherapy in achieving the correct center of gravity and correct posture in children with CP was demonstrated during just one session. It has been proven that hippotherapy helps to improve gait, balance and motor function, not only in patients with CP but also in children with developmental delay, Down's syndrome, in the elderly and patients recovering after a stroke. The series of studies showed a significant impact on the level of self-esteem, life satisfaction and, most importantly, the quality of life among disabled people.

CONCLUSIONS: Hippotherapy has positive therapeutic effects in patients suffering from various disabilities both within the musculoskeletal system as well as in psychological and social areas. It is an attractive and effective method of adjunctive therapy.

KEY WORDS

quality of life, disability, rehabilitation, cerebral palsy, hippotherapy (therapeutic horseback riding)

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STRESZCZENIE

WSTĘP: Hipoterapia jest metodą rehabilitacji psychoruchowej, w której stosuje się konie. Jest jedną z form terapii naturalnych, wykorzystującą pozytywny wpływ kontaktu ze zwierzęciem na zdrowie i samopoczucie człowieka. Jest wieloprofilową formą rehabilitacji ruchowej opartą na neurofizjologii, wciąż bardziej popularną w innych krajach Europy i w USA niż w Polsce.

CEL PRACY: Celem pracy jest przedstawienie hipoterapii jako skutecznej metody wspomagającej rehabilitację w sferze biopsychospołecznej osób niepełnosprawnych. Analiza opiera się na przeglądzie piśmiennictwa i dotychczasowych badań nad tą formą terapii.

MATERIAŁ I METODY: Materiał zebrano za pomocą bibliotecznej wyszukiwarki ALEPH. Piśmiennictwo pozyskano z takich baz danych, jak PubMed i Medline.

WYNIKI: Przeprowadzone dotąd badania wskazują na przydatność hipoterapii w usprawnianiu chorych na mózgowie porażenie dziecięce (MPDz). Prezentowane wyniki wskazują na istotnie lepsze efekty rehabilitacji u dzieci z MPDz poddanych skojarzonemu leczeniu metodą PNF i hipoterapii. Wykazano skuteczność hipoterapii w osiągnięciu prawidłowego środka ciężkości u dzieci z MPDz, już w trakcie jednego zabiegu, oraz prawidłowej postawy ciała. Udowodniono, że hipoterapia przyczynia się do poprawy chodu, siły motorycznej i równowagi nie tylko u chorych na MPDz, ale także u dzieci z opóźnieniem rozwojowym, z zespołem Downa oraz u osób w wieku podeszłym i po udarze. W wielu badaniach potwierdzono istotny wpływ na podniesienie poziomu poczucia własnej wartości oraz jakości i satysfakcji z życia wśród osób niepełnosprawnych.

WNIOSKI: Hipoterapia przynosi pozytywne efekty terapeutyczne u osób dotkniętych różnymi schorzeniami zarówno w obrębie aparatu ruchu, jak i w sferze psychicznej oraz społecznej. Jest atrakcyjną oraz skuteczną metodą wspomagania rehabilitacji.

SŁOWA KLUCZOWE

jakość życia, niepełnosprawność, rehabilitacja, mózgowie porażenie dziecięce, hipoterapia

INTRODUCTION

Hippotherapy, as defined by the Polish Hippotherapy Association (PHA), is a targeted therapeutic activity aimed at improving functioning in the areas of physical, emotional, cognitive and/or social activities. Moreover, an integral part of the therapeutic process is a specially trained horse. It is carried out by a qualified hippotherapist according to the recommendations of the doctor in charge of the hippotherapy, who cooperates with other specialists in the field of medicine, pedagogy, psychology and rehabilitation [1].

Although the therapeutic effect of riding was already known in ancient times, this method, however, was officially recognized in the 1950 s, by Liz Hartel, affected by polio and Danish silver medal winner at the 1952 Olympic Games in Helsinki [2,3]. In Poland, the first time hippotherapy was used was in 1985 in Swoszowice, when a group of doctors from Krakow organized horseback riding therapy for patients treated at the Rehabilitation Clinic for Children and Mother and Child youth Specialist Team in Krakow. In 1992, owing to the initiative of the Krakow Foundation for the Development of Horse Rehabilitation of Disabled Children, the Polish Hippotherapeutic Association was established [4].

According to the canons of the PHA, the following forms of hippotherapy can be distinguished:

1. Physiotherapy on a horseback – it is aimed at improving movement and is conducted by a physiotherapist or under his supervision. This includes medicinal gymnastics on horseback moving at a medium walk. While riding at a four-beat gait, the rocking back of the animal in an alternating, rotating and three-dimensional manner, makes the rider's pelvis go up and down, forward and backward and from side to side. This movement is identical to that of the pelvis during walking in healthy humans. Whilst riding a horse at a medium walk, movement impulses are sent to the disabled person's brain and consequently affect the position of the rider. This leads to encoding in the patient's brain the proper movement pattern of the pelvis during walking.
2. Psycho-pedagogical riding and equestrian vaulting – a set of riding, psychological and pedagogical activities, undertaken to improve the physical, cognitive, emotional and intellectual condition of a patient. The acquisition of riding skills and communing with such a large animal, as a horse is, increases the self-esteem of the patient, relieves emotional disturbances, and promotes the development of positive social contacts. This form of hippotherapy is led by a psychologist, teacher, occupational therapist or a qualified hippotherapist under their guidance.
3. Therapy by contact with a horse – the therapeutic principle of this form of hippotherapy is the pa-

tient's contact with the animal, unlike horse riding as such. This also applies to establishing contact with the surrounding environment (stables) and other people who share a common interest in living alongside horses [1,5].

MATERIAL AND METHODS

In addition, recreational and sport horseback riding for the disabled can be distinguished, which is not part of hippotherapy, but remains closely connected and can have therapeutic effects [1].

Hippotherapy is used in both children and adults. In children, the following diseases are indicative for this therapy: Cerebral Palsy (with head self-control and an active sitting position), conditions after cephalo-brain injuries, minor brain damage, muscle diseases of a force of min. 3 points on the Lovett scale, diseases and mental disorders, visually impaired and blind children, postural defects, scoliosis up to 20° according to Coba (except progressing idiopathic scoliosis), post amputation, malformations, Down's syndrome, emotional disturbances, mental retardation, social maladjustment and psychomotor retardation of unknown etiology. Among adults, hippotherapy is used in multiple sclerosis, in conditions after stroke and cephalo brain traumas, mental illnesses and disorders, addictions and social pathologies [1].

The purpose of this work is to promote and motivate the implementation of this therapy among health professionals, researchers, and among other people dealing with the disabled. The paper presents selected aspects related to the characteristics of hippotherapy and the effective impact of this method on the health of people of different ages and with different ailments. The positive therapeutic effects of this method in physical, mental and social fields were also discussed in detail.

RESULTS

According to the Polish Association of Hippotherapy, there are four spheres of influence of hippotherapy: physical, emotional-motivational, cognitive and social. In the area of physical therapy of disabled people with locomotor dysfunctions, hippotherapy encodes the correct pattern of movement during walking, stimulates and normalizes nociception and proprioception, increases overall physical fitness and improves the coordination of motor skills, especially balance and a sense of rhythm, as well as improvement in orientation in space and the construction of one's own body [1,5,6,7]. The impact in the emotional-motivational

sphere increases motivation and acceptance of the therapeutic process. It also increases self-esteem and reduces emotional distress. The cognitive field stimulates the reception of sensory perception, improvement in visual and auditory perception, but also stimulates attention, memory, thinking, speech, and acquiring and developing new skills. In the social sphere, psychosocial activation occurs, including the development of positive social relationships [1]. The studies of Manikowski et al. have shown that a single hippotherapeutic session of a child with cerebral palsy (CP) can have a significant impact on the normalization of gait speed. After just one session of hippotherapy, the results revealed statistically significant changes in the patient's speed of movement. The tested parameters such as gait frequency, stride length, duration and symmetry, were closer to the reference values for the age of the examined child [8].

El-Meniawy and Thabet studied the problem of acquiring the skills of determining distance in space and the adoption of proper posture. They conducted a survey among children with cerebral palsy with spastic diplegia aged 6 to 8 years old who participated in hippotherapy once a week for three months. After the therapy, they demonstrated significant improvement in symmetry of the back muscles in a group of children undergoing hippotherapy [9]. Similar studies in children with hemiplegia were conducted by El-shafey. The author obtained results which also confirmed the effectiveness of the therapy in improving balance and back geometry in children with cerebral palsy [10]. The results of the studies conducted by Mackow et. al. on the impact of neurophysiological hippotherapy on the change in the center of gravity of the body in children with cerebral palsy, speak in favor of improving the balance and orientation of one's own body structure. The study included 19 children aged 4-13 years old with cerebral palsy who featured an asymmetric anti-gravitational model of compensation. The children's balance was tested with a Cosmogamma balance platform before and after hippotherapy. These studies confirmed that only one treatment of neurophysiological hippotherapy significantly affects the displacement of the center of balance of the body in the frontal plane and the average value of oscillation in the sagittal plane in children with cerebral palsy [11].

The effectiveness of hippotherapy on the improvement in posture, normalization of muscle tone and coordination and gait was shown not only in the group of children with cerebral palsy. Yun-Hee Sung et al., conducted a study on the effects of hippotherapy on balance and gait symmetry improvement in people after a stroke. The experimental group in this study consisted of 10 patients at a mean age of 48 who were participants in a hippotherapy session lasting 15 minutes a day, 5 times a week for a month. Hippotherapy was

preceded by other standard rehabilitation activities. Electromyography was used to assess the quality of gait, trunk muscle function and nerve conduction. The results of these studies show the effective stimulation of hippotherapy to improve gait and eliminate body asymmetry [12]. Sunwoo et al. examined 8 adult men with various brain disorders, including 5 individuals after a stroke, 2 people with traumatic brain disorders and a person with cerebral palsy. All the subjects were evaluated according to the Berg, Tinetti balance scale, a 10-meter walking test, Beck's Depression Inventory and the Hamilton Rating Scale before and after hippotherapy. The authors obtained results of significant improvement in walking speed and balance in comparison to the evaluation before the sessions, and these effects persisted for two months after the end of hippotherapy [13]. Other reports also present the effective impact of hippotherapy in the rehabilitation of people with gross motor disabilities. These studies were conducted by Champagne and Dugas in an 11-week program of hippotherapy sessions in two children aged 28 and 37 months with Down syndrome. The measurement of motor function was performed using a GMFM scale (Gross Motor Function Measure) and accelerometry. The authors proved that the GMFM in both the first and second child, improved especially in running, walking and jumping. The analysis of the spectral power of accelerometer signals confirmed the improvement in patients' postural control of the head and trunk [14]. The same results in terms of motor functions on a GMFM scale of a larger population were obtained by the authors of other tests. Sook Park et al., studied a group of 34 children with cerebral palsy who participated in a 45-minute session of remedial gymnastics on horseback for two months. The Pediatric Quality of Life Questionnaire was also applied, and the results demonstrated the beneficial effects of hippotherapy on improving self-reliance, activity and social functioning [15].

Araujo et al., conducted a study aimed at evaluating the influence of hippotherapy on mobility, muscle strength and balance in the elderly. 12 people aged between 60 and 84 years enrolled in an 8-week program of hippotherapy. The researchers obtained results which showed that hippotherapy improves balance and endurance of the lower limbs in the elderly [16].

Sawaryn in her research on the effects of hippotherapy on hand motor skills in 53 of children with cerebral palsy showed clear improvement in using a spoon, precision gripping and throwing a bag [17]. The usefulness of hippotherapy as a means of supporting traditional physiotherapy in improving the condition of patients with CP was also discussed in the study by Białoszewski et al. The results achieved by these authors indicate significantly better results of rehabilita-

tion in children treated with combined PNF and hippotherapy [18].

During contact with a horse during the therapeutic process, a disabled person experiences a situation in which the horse accepts him as his guide. The animal despite its huge advantage of power, subjects to them, tries to understand them and serves with devotion. This kind of relationship affects a number of diverse, positive experiences in many spheres of a human that shape their personality, enrich the grim reality of everyday life, and thus enhance the quality of life of a patient [5]. Białoszewski et al. support that with their research in which they assess the effects of hippotherapy on the level of life satisfaction and acceptance of the disease among parents of children with cerebral palsy. The authors demonstrated that after a year of activities connected with this form of therapy, there was a significant increase in overall life satisfaction among parents and children and acceptance of the disease [19]. This phenomenon is confirmed by the results of research by Thompson et al., where a group of 8 children with developmental delays and movement disorders, through the efforts of hippotherapy, obtained results of improvement in confidence, self-esteem and quality of life [20]. The research conducted by Lipińska-Stańczak et al. shows that nearly 90% of parents of children with cerebral palsy attending hippotherapeutic sessions believe that this therapy has a significant impact on the psychological condition of the child and their well-being [21]. The positive impact of therapeutic horseback riding on the self-esteem of people with disabilities was also a subject of the research by Asselin et al. who tried to determine the benefits resulting from this method. The study was conducted among US veterans from Iraq and Afghanistan who had suffered traumatic experiences of war and associated depression. In addition, the soldiers suffered from partial spinal injuries and the therapeutic activities with a horse increased their balance and muscle strength. These activities significantly influenced the effectiveness of functional activities of daily life, quality of life and self-esteem [22].

The team by Guerino et al. undertook research into the effects of hippotherapy on the social and emotional sphere of life of sexually abused patients who suffered from traumatic emotional stress. The study included two women aged 18 and 21 who in early childhood were victims of sexual violence. In addition, they were characterized by a postural defect and significant limitations of the motor system and coordination. Each of the surveyed women participated in 20 sessions of hippotherapy lasting 30 mins. This therapy in 30% contributed to a change in the regulation of body posture, resulted in 80% improvement in coordination, and 50% improvement in body balance, openness to interpersonal relationships and self-esteem. In this

case, hippotherapy proved to be effective treatment not only in the physical area but also the mental one [23].

Tabares et al. analyzed the levels of hormones from saliva samples taken before and after the sessions of hippotherapy for children with autism. The conclusion of these studies was an assertion of the authors that hippotherapeutic sessions adjust the levels of hormones which affect the stimulation of social behavior [24].

It is also worth mentioning that Thrall and Moser were researching the effects of hippotherapy on speech coordination in a person with a traumatic brain injury in a 24-year old woman. In this case, hippotherapy was an effective treatment strategy for improving the fine motor coordination required for speech [25].

DISCUSSION

Hippotherapy is recommended as adjuvant therapy to the essential rehabilitation program, and when other methods of rehabilitation are insufficient to obtain optimal and achievable outcomes [18]. This method can provide advantages in all spheres of human functioning. This process does not run in isolation, but occurs simultaneously. During the neurophysiological form of hippotherapy aimed at improving gait, other skills are developed parallelly, including making contact with the horse, with the environment and other people staying in the facility (which is the main task of the form of therapy with a horse). During the process of physiotherapy, when a child rides a horse, exercises stimulating intellectual, cognitive, social and emotional processes can be implemented. All this is characteristic for the form of hippotherapy referred to as psycho-riding and equestrian vaulting. A patient undergoing treatment involving contact with a horse, aimed at creating a therapeutic situation, can simultaneously participate in other forms of hippotherapy unless there are other contraindications. The unique feature of this method of rehabilitation consists in combining interaction and mutual transfer of its forms of improvement. In Poland, often different forms of rehabilitating patients with a horse are defined by one term i.e. hippotherapy. The vast majority of authors of the presented works also used the term – hippotherapy [8,9,10,11,12,13,14,15,16,17,18,19,20,21, 23,24,25].

According to the American Hippotherapy Association (AHA), undertaking activities in order to achieve improvement with the help of a horse is divided into Hippotherapy, therapeutic riding and Equine Facilitated Psychotherapy (EFP). The term hippotherapy itself (from Greek – treatment with a horse) means the use of methods of physiotherapy and occupational therapy

in the treatment of various pathologies. Furthermore, it is used when a therapist uses the movement of the horse to achieve neurophysiological improvement. In hippotherapy 3 main activities can be distinguished: physical therapy that focuses on achieving results related to the improvement in physical function (standing, sitting and walking), occupational and speech therapy. In hippotherapy – occupational refers to work on motor activity, sensory integration, cognitive processes and skills that are used in everyday activities. Therapeutic riding (HBRT) refers to the activity that uses the horse to support the development of people with disabilities. During this activity, the effects of hippotherapy are accompanied by acquiring additional riding skills. EFP is a form of psychotherapy that focuses on the mental health of a patient. When using this form, the mental health therapist supports the patient in the clinical interpretation of feelings and emotions. Hippotherapy, therapeutic riding and EFP use different activities with the horse to achieve their purpose [22,26,27].

Sterba carried out a comparative analysis of 11 published works in terms of the effects of horseback riding therapy and hippotherapy in rehabilitating children with cerebral palsy. The author proved that both HBRT and hippotherapy are individually efficacious and are both medically indicated as therapies for gross motor rehabilitation in children with CP [28]. Whalen et al. drew similar conclusions as a result of their research in which they analyzed the effective impact of various forms of hippotherapy [29].

According to the AHA, hippotherapy is implemented by a professional therapist: occupational therapist or speech-language pathologist or physical therapist in conjunction with a competent horse handler and a specially screened and trained horse (hippotherapy vs. therapeutic riding). In therapeutic riding, emphasis is put on a proper riding position and reining skills – not functional therapeutic goals. It is carried out by a certified therapeutic horseback riding instructor in cooperation with volunteers. EFP is carried out by a mental health therapist [30].

In Poland, hippotherapy is conducted by a so-called hippotherapeutic team, which includes an attending physician or a consulting team, qualified hippotherapist and cooperating personnel: physiotherapist, psychologist, teacher, special education teacher, speech therapist, neurologist, orthopedist or other specialist, depending on the nature of the patient's problem [1].

Since 1994, the Polish Hippotherapeutic Society has conducted courses for riding instructors with a specialization in hippotherapy. This profession has been included in the Classification of Occupations and Specializations, where the profession of a hippotherapy instructor (No. 323006) is a part of group 32 (mid-level medical personnel) in subgroup 3230 'Practicing unconventional or complementary methods of therapy'

[4]. The grounds for granting professional qualifications of a hippotherapy instructor is to complete a course (passing practical and theoretical exams) [31]. Each person holding a minimum of a secondary education and possessing the ability to ride a horse and experience in contact with horses can enroll in the course. It is recommended (not required) that the candidate holds higher education in one of the following faculties: medicine, physiotherapy, psychology, special education, education, rehabilitation and occupational therapy [32].

The primary responsibility of a qualified hippotherapist is the concern for improving the health of a charge. They determine the program and objectives of hippotherapy according to the referring physician, who prescribes the patient classes and according to the individual needs of the person undergoing rehabilitation. The hippotherapist can also lead the therapy based on a program developed by other specialists in charge of the patient. During the entire process of hippotherapy, the hippotherapist shall conscientiously keep personalized documentation of each patient, which should include referral for hippotherapy accompanied by full diagnosis of the disease, periodic check-ups, with a detailed description of the health condition (carried out at least once a year) and a descriptive assessment of the progress in classes [1].

Choosing the right horse is a very important element of the discussed process of therapy. The usefulness of the animal in hippotherapy is not predisposed by race but its characteristics such as the type, character, temper and conformation. It is important that the animal be friendly to humans and feature patience, confidence and lack of shyness. These features minimize the likelihood of unexpected reaction of the animal, which directly affects the safety of the patient. Although preference is given to horses aged five years old, the decision whether to include a horse in hippotherapy or not depends on its mental maturity. The height of the horse also plays a decisive role in perfect matching of a juvenile or an adult patient and therapist, which provides for safe belaying [1,5].

In order to secure therapeutic kinesthetic interaction, the horse should be characterized by a free, efficient, resilient, rhythmic and flexible gait. Janura et al., conducted a study on the variability of movement during the gait of horses used in hippotherapy. The study comprised two English Thoroughbreds which participated in six sessions of hippotherapy. Three-

dimensional video was used to estimate the space-time parameter of the horse's movement during walking. 3-D video was also applied to record the movement variability of the back and the legs of the horse. The studies showed that both single and multiple hippotherapeutical sessions, the duration, step frequency and the speed of movement between the tested horses did not differ significantly from each other. The authors found that the performance of the horse's movement during hippotherapy can be affected by the way the animal is lead. Therefore, for the sake of treatment effectiveness and for the safety of the session, the animal during hippotherapy should be guided by an appropriately trained person [33].

A horse, which is an essential tool in hippotherapy, is a living creature and it must be granted adequate working conditions. If the animal used in the therapy is rested, fed and properly maintained, it will translate into the efficiency of its motion, as well as the relationship which exists among the horse – patient-therapist. The team of researchers Park et al. carried out a study on comparing the performance of three-dimensional movement of a constructed robot-horse with the movement of a live animal. These studies showed that although an automated robot-horse can provide variable movement patterns, they differ from the natural stimuli of a real animal [34]. Moreover, a robot, which will even interact kinesthetically 100% realistically as a living horse, it will never have the impact on the emotional, mental, perceptive and social spheres of a patient.

CONCLUSION

In conclusion, hippotherapy is an effective and functional method to support the process of rehabilitation of people with disabilities. It is a form of therapy which positively affects different levels of human functioning of patients with various diseases. It brings benefits in improving motor, mental and social skills, both, in children and in adults. Although a horse, which is an extremely strong animal and skittish by nature, is the main tool in hippotherapy, the presented study did not record incidents where the health or life of the patient was exposed to danger. It can, therefore, be concluded that hippotherapy is not only an effective but also safe method of therapy.

Author's contribution

Study design – E.B. Kolarczyk, G. Markiewicz-Łoskot
Data collection – E.B. Kolarczyk
Data interpretation – E.B. Kolarczyk, J. Jaromin, G. Markiewicz-Łoskot
Manuscript preparation – E.B. Kolarczyk, J. Jaromin
Literature research – E.B. Kolarczyk, J. Jaromin

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