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Case Study

Hippotherapy as a treatment for socialization after sexual abuse and emotional stress

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Abstract. [Purpose] Hippotherapy is a therapeutic resource that uses the horse as a kinesiotherapy instrument to elicit motor and cognitive improvements in individuals with special needs. [Subjects and Methods] This research evaluated two women aged 18 and 21 years, who had suffered sexual violence when they were children between the ages of 6 and 7 years old. The subjects did not have mental dysfunction but they were regular students registered at a school of special education. The patients presented severe motor limitation, difficulty with coordination, significant muscular retractions, thoracic and cervical kyphosis, cervical protrusion wich was basically a function of the postures they had adopted when victims of the sexual violence suffered in childhood. The patients performed twenty sessions of 30 minutes of hippotherapy on a horse. The activities were structured to stimulate coordination, proprioception, the vestibular and motor-sensorial systems for the improvement of posture, muscle activity and cognition. [Results] The activities provided during the hippotherapy sessions elicited alterations in postural adjustment resulting in 30% improvement, 80% improvement in coordination in, 50% improvement in corporal balance and in sociability and self-esteem. [Conclusion] Hippotherapy proved to be an effective treatment method for coordination, balance and postural correction, and also improved the patients' self-esteem that had suffered serious emotional stress.

Key words: Hippotherapy, Motor coordination, Emotional stress

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INTRODUCTION

Childhood sexual abuse is a major public health problem that affects 16% of women in Brazil at some time before their 18th birthday[1)] and is a common cause of post-traumatic stress disorder (PTSD). According to Berget and Braastad[2)] animals are able to induce and mediate physiologically de-arousing states of anxiety and arousal Hippotherapy is a method of treatment for the physical and mental rehabilitation of people with disabilities, difficulties and physical mental and/or psychological disabilities, and it uses a horse in an interdisciplinary approach[3)]. To Muñoz Lasa[4)] a horse expresses the magical side of man, the symbol of the unconscious psyche or the non-human psyche, encompassing notions of speed, imagination, and immortality, and represents the instinctive sublimation. The horse acts as a facilitator eliciting physical and psychological improvements in the patients[5, 6)] through heavy muscular work, and contributes to patients' muscle tone, coordination and balance improvement[7)]. Hippotherapy utilizes rhythmic and three-dimensional oscillations of horseback riding to trigger neuromuscular responses which stimulate the postural reflex mechanisms of the rider[6, 7)].

In hippotherapy, we can exercise a patient's cognitive function, stimulating the tactile, visual, auditory and olfactory senses by the environment, thereby using the horse to promote body organization and awareness, and increase self-esteem, which can be seen in the recovery of feelings of security, facilitating social integration, motivating learning, encouraging the use of language, teaching the importance of rules and disciplines, and increasing the ability and independence of decisions in different situations, to develop an individual's emotional adaptation[8–10)]. The main published evidence of the therapeutic efficacy of hippotherapy has been published in the field of neurological and motor rehabilitation[9, 10)].

One of the challenges of life in Brazil today is to live with the sequelae of violence experience in everyday life as kidnappings, sexual violence, murder and other unnatural causes[11)]. Many of the people witnessing these happenings have deep sequelae, which alter their emotional stability and physical harmony, and therefore their personal, professional and social lives. This causes some of these victims not to return to normal life, since they bear memories and feelings they would like to overcome[3)].

Conventional treatments for dealing with this kind of stress use drugs and psychotherapy. Drugs relieve symptoms, but sometimes have side effects, and psychotherapies which

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make the person dependent on aid for months or even years, which often hinders the proper development of the social normalization of these people. Deep sequelae are evident in children who have suffered sexual abuse[11]. This study conducted a treatment program in equine therapy for two patients who had suffered sexual abuse and had difficulty with the process of socialization.

SUBJECTS AND METHODS

This case study refers to two female patients, 18 and 21 years old, who suffered sexual violence at home when they were children between 6 and 7 years old, which elicited physical and psychological defenses against new aggression or danger, thus generating mutism accompanied by a form of catatonia and repression of emotions and sensations. Initially diagnosed with "Blunted Affect", they didn't present mental dysfunction. Even so, they were students regularly enrolled in the APAE (Association of Parents and Friends of Exceptional Children). The patients had large motor limitation, difficulty with movement coordination, significant muscle contractions which promoted postural change of cervical and thoracic kyphosis, and cervical protrusion due to adoption of defensive postures as a result of the sexual abuse they suffered in childhood. The patients had difficulty in communicating because of voluntar suprression of speech, however they understood all the commands given by the therapist and communicated timidly by nods and shakes of the head.

Before commencing this study, we obtained consent forms signed by the patients' parents. The intervention protocols followed the rules of Resolution 196/96 of the National Health Board on Research involving humans, and received the approval of the Ethics Committee Research of UNISEP number 019/08.

The procedures were performed at the hippotherapy center of UNISEP in Dois Vizinhos, PR. At the beginning, the patients were evaluated using the standard evaluation of the hippotherapy center: evaluation by goniometry of flexion and extension of the cervical spine, adopted in the standard anatomical position. The evaluation was performed in the anterior, posterior, right profile and left postural positions with the aid of a simetrograph. The functional balance performance was evaluated using the Berg Balance Scale[12].

Coordination tests were performed using motor coordination tests[13]. All the above tests were performed before the first and after the last hippotherapy session.

The patients received twenty sessions of hippotherapy on horseback, lasting 30 minutes at most, once a week for 6 months. The activities were structured to stimulate coordination, proprioception, the vestibular and sensory motor systems, with the aim of improving posture, strength and cognition. The patients rode on horseback, with the horse walking on a sand track, with changes of direction and combinations of movements provided during the treatment sessions. The equipment used were a riding blanket, a saddle, a protective helmet, and extremely docile and trained animals. The patients carried out simple mount, reverse and side mount with and without the use of stirrups, besides neuro-development postures which are described in the execution protocol.

The first session consisted of a physiotherapy assessment and an assessment while mounted on the horse. In the first evaluation it was evident that there was an increasing overall muscle tone with greater intensity in the region of the upper trunk and shoulder girdle muscles of both patients. Dorsal kyphosis was the most obvious and striking change, followed by retraction of the shoulder girdle with protrusion and internal shoulder rotation. The patients did not speak and showed plethora of the face with minimal facial expression, however, they understood well, and almost always responded to questions through simple and limited nods and shakes of the head.

The patients introduction to the horse was held in the first session. After a few attempts the patients, who were fearful at first, began to touch the horse's back and neck with their hands, then made their first mount. We evaluated their achievements on the horse's back, initially stationary and then walking. In this evaluation we observed good interaction with the animal, but both patients had a precarious balance. At all times the motivational question was developed with incentives and encouragement given to the patients, even though they did not show any reaction.

Over the first three sessions the patients evolved by carrying out a mount without putting their feet in the stirrups and holding on only with the right hand, then with the left hand and in sequence, without any of the hands, the body being free on the horse's back while it was walking. The patients performed some flexions to touch the right foot with the right hand and then, repeating the same exercise on the contralateral side 10 times. In addition, the patients embraced the horse's neck 10 times, performed 10 rotations of the trunk to the right and 10 to the left, with both hands touching the back of the horse.

In the third and fourth sessions, the movements performed previously, were practiced with an emphasis on gaining flexibility and balance, repeated more rapidly, dynamically and sequentially. In these two sessions, exercises of opening the arms, abducting them, and riding with the eyes closed, and with the horse walking and making a total of 5 laps around the track with the eyes alternatively open and closed at short intervals. Finally, with the help of cones arranged linearly, there were three sequences of 5 zigzag laps, with the eyes open and the arms abducted.

In the fifth and sixth sessions, the patients performed position change exercises while mounted on the walking horse, progressing from the facing mount to the side mount, and from the side mount to the inverted mount, and then returning to the starting position. This sequence was repeated 5 times in each session. In the seventh and eighth sessions training for neuro-evolutive postures was included such as rising from sitting in the all-fours position, half-kneeling, kneeling and finally standing in the stirrup, with the horse stopped. At this time, we noticed the attention of the patients was significantly higher than in the previous sessions.

In the ninth and tenth sessions, with the horse walking, the patients performed changes of position, from cat sitting to crouching with the help of the therapist and the assistant, evolving to change without the therapist's help, and then standing up in the stirrups. At this point, the patients began to mount and dismount with the help of the therapist. Note: The horse was guided straight and also making big circles

following an oval-shaped track.

In the eleventh and twelfth sessions the exercises were carried out with assistive devices such as balls, cones, hula hoops and a bat. Throwing exercises were performed with a ball using just one hand, and then with both hands throwing the ball to the assistant who was standing about 3 m away. This exercise progressed to throwing the ball to another patient who was receiving therapy at the same time. Exercises were also conducted on a competitive character throwing a ball into a basket, and throwing hula hoops in order to circle cones.

In the thirteenth and fourteenth sessions the ball throwing exercises to the basket and circling the cones with hula hoops were carried out with the horse walking. Note: one of the patients showed a slight smile during this therapy. In the fifteenth and sixteenth sessions we conducted exercises throwing a ball. The patient threw the ball to an assistant, while the patient was standing in the stirrups and the horse was stopped, then the assistant threw the ball and the patients tried to catch it.

In the seventeenth and eighteenth sessions the previous exercises were repeated, with the patients interacting with each other. The horses were positioned parallel and approximately 3 meters away. The patients stood in the stirrups, facing each other (throwing and catching the ball), interacting all the time. It's important to emphasize that reactions outlining happiness or slight smiles became more frequent.

Ending with the nineteenth and twentieth session, the previous exercises from the last 4 sessions were repeated, varying the size of the balls (12 to 45 cm) and the speed of each one, always with the interaction of the patients.

RESULTS

The execution of the exercises on the horse restored the patients' coordination activities and balance, facilitating normal movement, and sensory motor stimulatory activity of basic movements, elicited active responses from the patients, especially in terms of functional motor skills, reeducating coordination activity through the movements required to perform the tasks described above.

A significant improvement in repositioning of the neck around 15 degrees as well as through therapeutic exercises on the horse, led to a reduction of about 30 degrees in thoracic kyphosis.

The patients' abilities and potentialities were developed and expanded through the riding therapy. It increased their affective capacities, excited their interest and aroused their curiosity, and improve their acceptance of physical contact and allowed their emotions to show, as well as undoubtedly improving in their integration as describe in Table 1. These results were obtained from the validated psychology questionnaire of the APAE, which was conducted bimonthly.

DISCUSSION

According to Hammer et al.[14] equine therapy can be an agent of rehabilitation and education in the treatment of people with special educational needs, serving education, physical and psychological aspects as well as specific therapeutic needs.

Considering that at the beginning of the therapy our patients presented improper placement of the neck due to trauma suffered through being subjected to sexual violence in childhood, and both had protrusion of the neck and anteriorization associated with cervico-thoracic kyphosis. The subjects showed a significant improvement in repositioning of the neck as a result of therapeutic exercises on the horse, and showed regression of thoracic kyphosis. This seems to agree with the findings of Silkwood-Sherer and Warmbier[15], who reported that significant improvements were promoted by hippotherapy in imbalances in the spine of patients with multiple sclerosis. We can say that the postural rehabilitation promoted by the hippotherapy described above, provided sufficient stimuli to elicit a motor response adjusting to the muscles of the posterior chain.

During the execution of the exercises on the horse, we observed the restoration of coordination activities and balance. This would have facilitated normal movement and stimulates sensory motor activity of basic movements, eliciting active responses by the subjects, especially functional motor skills. In turn, this would have reeducated coordination activity through the movements used to perform the tasks. Debuse, Chandler, Gibb[16] and Meregillano[17] note that the central nervous system reacts to stimuli from outside and inside the body, inhibiting uncoordinated activity and simultaneously facilitating utility functions, boosting motor learning ability.

For Hammer et al.[14] state that greater motor control, and repetition of the movements that reduce postural reflexes, balance reactions and spatio-temporal perception of various body segments in space, as well as muscle strengthening would explain the observed changes in both behavior and postural correction. However, we must emphasize that the effect of hippotherapy is multi-factorial, involving a number of combinations and settings. It is necessary for the therapist to have a broad knowledge of techniques associated with the movement performed by the animal, because according to Cirulli[18], automatic postural stability in alignment with the center of gravity forces the rider to adapt to the movements of the horse as well as interacting with the environment. Moreover, changes of direction and speeds used in the course of animal gait evoke pelvic displacement and pelvic rotation, increasing the value of the horse as an instrument of kinesiotherapy.

Although the subjects were initially diagnosed as having "Blunted Affect" and "Mild Mental Disability", after formal

Table 1. Percentage (%) of the capabilities developed by hippotherapy evaluated by APAE psychology subscales

Parameters/Time	2 months	4 months	6 months	8 months
Affective disorder	15	25	30	40
Interest	25	35	40	45
Physical condition	10	12	15	20
Emotionality	10	17	20	30
Socialization	12	20	25	30
Self confidence	20	27	31	35
Self esteem	5	10	15	20

evaluation and observations made in integration activities, we noted the invalidity of the "Blunted Affect" diagnosis because they accepted physical contact and involuntarily demonstrated emotions[19]. For a definitive diagnosis of affective blunting the patient should not smile when witnessing a comic event or be touched by the sadness of another person.

Emotional dysregulation is considered a core characteristic of Borderline Personality Disorder (BPD). Feliu-Solera et al.[20] reported that individuals have a heightened negative emotional intensity at baseline, but they do not demonstrate higher emotional reactivity to negative stimuli, nor do they show a distinct pattern of recovery when compared to healthy controls.

According to Grees[21], the confidence obtained by riding therapy helps accelerate the process of potential development, wich is responsible for the personal and social integration of subjects with psychological deficiencies or psychological problems, and it can be enhanced by the action of therapists. Barolin and Samborski[22] reported that equine therapy generally produces a psychotherapeutic process, developing a psychogenic effect through joy, change of environment and the emotional contact with the animal, all of which renew the subject's motivation in rehabilitation. Therefore, equine therapy becomes a method of mental and motor rehabilitation, serving as a facilitator for the teaching and learning processes, as well as socialization. We observed this in our subjects during the tenth session when they started to show light, sporadic smiles during task performance, a finding that is consistent with studies that have shown improvements after hippotherapy interventions in psychological and social aspects[23]. Hippotherapy has been utilized to treat cerebral palsy, multiple sclerosis, spinal cord injury, stroke, and intellectual disabilities[24] and in our work to treat emotional stress.

This study had limitations due to the number of subjects, and the evaluations, among others. However, the findings support the view that the activities provided in hippotherapy sessions improve postural adjustment, motor coordination, balance disorders, and especially the socialization of patients with severe emotional trauma. This suggests that hippotherapy activities can generate a combination of stimuli that go beyond the physical aspects integrating cognitive and affective development of socialization in individuals with emotional stress. Although much has been written about hippotherapy in sexual abuse and emotional stress, the literature has not described detailed treatments that would help physical therapists understand how this experiential treatment works and the impact it can have on patients. A new perspective on the use of hippotherapy in treatment is presented in this article.

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