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Original article

Equine-assisted therapy in cerebral palsy: caregiver's perception

Equoterapia na paralisia cerebral: percepção do cuidador

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Abstract

Objective: to evaluate behavioral changes and motor skills of children with cerebral palsy in equine-assisted therapy in the caregiver's perception. **Materials and Methods:** this is a descriptive, cross-sectional and quantitative study, composed of 13 parents/caregivers of children with cerebral palsy, aged between 2 and 16 years, conducted in the city of Montes Claros, MG, Brazil. Data collection was done through an online questionnaire answered by the caregiver about the evolution of treatment. **Results:** 69.2% of the sample began to interact better, 84.6% showed improvement at home and 77.8% at school, and all children showed improvement in self-confidence after starting treatment. Regarding the association between treatment time and the improvement in the child's ability to sit with support, a statistically significant difference was observed (p=0.02). **Conclusion:** the participants reported improvement in social interactions, motor functions of daily living, and especially the ability to sit with support.
Keywords: Cerebral palsy. Physiotherapy. Equine-assisted therapy. Caregiver.

Resumo

Objetivo: avaliar mudanças comportamentais e habilidades motores de crianças com paralisia cerebral em equoterapia na percepção do cuidador. **Materiais e Métodos:** trata-se de um estudo descritivo, transversal e quantitativo, composto por 13 pais/cuidadores de crianças com paralisia cerebral, com idade entre 2 e 16 anos, realizado no município de Montes Claros-MG, Brasil. A coleta de dados foi feita através de um questionário *online* respondido pelo cuidador acerca da evolução do tratamento. **Resultados**: 69,2% dos participantes passaram a interagir melhor, 84,6% apresentaram melhora em ambiente domiciliar e 77,8% no ambiente escolar, e todas as crianças apresentaram melhora da autoconfiança após iniciarem o tratamento. No que se refere à associação entre tempo de tratamento e a melhora da capacidade da criança em ficar sentada com apoio, observou diferença estatisticamente significante (p=0,02). **Conclusão:** os participantes relataram melhora das interações sociais, funções motoras de vida diária e, principalmente, da capacidade de ficar sentado com apoio.
Palavras-chave: Paralisia cerebral. Fisioterapia. Equoterapia assistida. Cuidador.

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Introduction

Cerebral palsy (CP) is defined as a chronic nonprogressive infantile encephalopathy, resulting from a lesion of the central nervous system, presenting disorders that alter movement, posture, balance and coordination, presence of involuntary movements in a variable way. Among the definitions most accepted by various experts, the one elaborated in 1964 describes that CP is "a permanent, but not invariable, disorder of movement and also of posture, due to defect or nonprogressive injury of the brain in early life"[1].

Through research conducted in developed countries, it was possible to notice an increase in CP rates in recent decades, which can be attributed to the improvement of perinatal medical care, increasing the survival rate of children with low gestational age and birth weight, increasingly extreme. The prevalence of moderate and severe cases varies between 1.5 and 2.5 per 1,000 births. In underdeveloped countries, the incidence is 7:1000. In Brazil, studies show estimates of about 30,000 to 40,000 new cases per year[2].

Regarding the etiology associated with cerebral palsy, prenatal factors include infections and parasitoses such as syphilis, rubella, toxoplasmosis, cytomegalovirus, HIV; alcoholic intoxications, tobacco or drugs; radiation; trauma and maternal factors such as chronic diseases, severe anemia, malnutrition, elderly mother[3]. Perinatal factors include intracranial hemorrhages, hypoxic-ischemic encephalopathy, leukemia encephalopathy, and hyperbilirubinemia. The postnatal factors include mainly infections and cranial traumas[4].

According to the most dominant clinical characteristic, cerebral palsy can be classified as spastic, dyskinetic and ataxic. The presence of elevated tone characterizes spastic cerebral palsy and is due to a lesion in the pyramidal system[6]. While spasticity is predominant in children whose cerebral palsy is a consequence of preterm birth, in term children; the dyskinetic and ataxic forms are more frequent[7].

Represented by more evident atypical movements at the beginning of a voluntary movement that produces atypical movements and postures, dyskinetic cerebral palsy involves dystonia and coreoatetosis (muscle contractions and involuntary movements); it is caused by a lesion of the extrapyramidal system, especially in the nuclei of the base. Ataxic cerebral palsy is defined as a disorder that affects the coordination of movements, caused by a lesion in the cerebellum, normally presenting a gait with increased support base and intentional tremor[8].

The equine-assisted therapy is a therapeutic method that uses as main resource the horse in an interdisciplinary approach, through the multiprofessional team, in the areas of health, riding and

education, and seeks the biopsychosocial development of individuals with disabilities and/or special needs. The method requires the participation of the entire patient's body, thus contributing to the development of balance, motor coordination, muscle strength and body awareness, with the horse as the promoter of gain at the physical and psychic level. The first contacts with the horse, its interaction with the child, the act of riding and all handling contribute to new forms of socialization, self-confidence and self-esteem[9].

The horse has three natural scaffolds: trot, step and gallop. Thus, the main characteristic of equine-assisted therapy is to transmit to the patient a sequence of simultaneous movements, resulting from the three-dimensional movement of the horse with movements in the vertical plane, up and down, in the horizontal plane according to the transverse axis, to the right and left, and on the longitudinal axis, forward and backward. The movement of the horse is transmitted to the patient through the connection between the seat and the back of the animal, which is the center of execution of movements, and it is through this connection that the movements will be transmitted to the patient's brain, through the nervous system, connected to the continuation of execution, which generates responses that can activate the organism[10].

The child with CP needs a differentiated and special assistance, which will affect not only him/her, but the whole family, being extremely important the participation of parents and guardians in this process, as they follow them and can perceive the evolution and development of the child in his/her daily life[11]. A research conducted in a center of equine-assisted therapy in southern Brazil questioned about the perception of parents regarding treatment and reported numerous benefits, including the improvement in the balance of children, gross motor activities, language and socialization. It also emphasized the importance of the interdisciplinary team in knowing how to help parents and caregivers through positive and motivational explanations and stimuli, thus influencing positively the treatment[12].

Equine-assisted therapy is a method of treatment that has been expanding more and more, bringing a differentiated therapy and arousing curiosity, through contact with the animal, not only the child, but also the parents and/or guardians, who are very interested in the treatment, environment capable of enhancing the process of evolution. The research is based, then, on the interest in understanding how equine-assisted therapy assists in sensorimotor development, especially in the development of muscle tone, trunk control, balance and body awareness in children with cerebral palsy, through the tridimensional movement of the horse, aiming to evaluate behavioral changes and motor skills of children with cerebral palsy in equine-assisted therapy in the

perception of the caregiver.

Materials and Methods

The study presents a descriptive, cross-sectional and quantitative analysis. The sample consisted of 13 parents/caregivers of children with CP, aged between 2 and 16 years, who underwent treatment of equine-assisted therapy for at least three months, one session per week. Participants who did not adhere to rehabilitation were excluded.

The instrument used was an online questionnaire, applied through Google Forms. The link of the instrument was sent to the parents/caregivers and, in case of doubts, the researchers were available for contact through email and WhatsApp.

The approach to parents/caregivers took place online, firstly requiring the contacts of the participants in the centers of equine-assisted therapy present in Brazil, once the link was sent to places that perform the national network equine-assisted therapy. Next, the invitation was made, informed and explained to the participants as to the character of the study and procedures to be performed.

Statistical analysis was performed using SPSS software, version 21. The level of significance established for all analyses was 5%. The normality and homogeneity of the data variances were verified by the Shapiro-Wilk and Levene tests, respectively. The variables were reported as mean and standard deviation, since they presented normal distribution. Student's t-test was used to evaluate the correlation between time of equine-assisted therapy and psychomotor development. To determine the correlation between treatment time and improvement of social interaction and the correlation between treatment time and improvement of the child's ability to sit with support, the Pearson test was used. Categorical variables (social interaction, household environment and self-confidence) were described through their simple and relative frequencies.

The study was approved by the Research Ethics Committee of the Educational Association of Brazil, according to the consubstantiated opinion n. 5.227.943.

Results

The study included 13 parents/caregivers of children with a mean age of 9.30 years (SD=5.67). The mean time of treatment with equine-assisted therapy was three years and six months, with a minimum of three months and a maximum of ten years (SD=36.55 months), and the mean days of visits per week was one day (SD=0.48).

There was improvement in social interaction in 69.2% (n=9), improvement in home environment in 84.6% (n=11). Concerning the improvement in school environment, 77.8% (n=10) of the children presented better performance. All children showed improvement in self-confidence after starting treatment with equine-assisted therapy (Table 1).

Table 1. Percentage of improvement in social interaction, at home, at school and in self-confidence. (n=13).

Variables	Yes n (%)	No n (%)	Already performed n (%)
More interaction with other children	9 (69.2)	-	4 (30.8)
Improved self-confidence	13 (100.0)	-	-
Improvement at home	11 (84.6)	-	2 (15.4)
Improvement at school	10 (7.8)	3 (22.2)	-

When the correlation between the variable time of treatment and improvement of the child in social interaction was performed, there was no statistically significant difference between children with longer and shorter treatment time (p=0.7).

Regarding the correlation between treatment time and the improvement of the child's ability to sit with support (Table 2), a statistically significant difference was observed (p=0.02). No association was identified between treatment time and improved functional capacity for the other psychomotor variables.

Table 2. Percentage of children who achieved improvement in motor functions of daily living. (n=13).

Variables	Yes (%)	No (%)	Already (%)
Uses hands to eat	15.4	69.2	15.4
Uses spoon to eat	15.4	76.2	15.4
Uses well the spoon	15.4	76.9	7.7
Uses well the fork	7.7	92.3	-
Can hold the glass	53.8	46.2	-
Raises the glass to drink, but not too firmly	46.2	53.8	-
Lifts the glass firmly using both hands	23.1	76.9	-
Lifts the glass firmly using on hand	23.1	69.2	7.7
Can hold a toothbrush	30.8	69.2	-
Can put toothpaste on toothbrush	-	-	100.0
Has head control while hair is combed	46.2	46.2	7.7
Can carry comb or brush to hair	38.5	53.8	7.7
Combs the own hair alone	-	100.0	-
Sits down with support	76.9	7.7	15.4
Sits down without support	30.8	61.5	7.7
Sits and stands up from a chair with assistance	46.2	46.2	7.7
Sits and stands up from a chair without assistance	-	100.0	-
Moves from sitting to lying in bed	23.1	69.2	7.7

Crawls on the floor	30.8	61.5	7.7
Can stand with support on something	38.5	53.8	7.7
Can stand without assistance	-	100.0	-
Walks with support	30.8	61.5	7.7
Grabs small objects with one hand	69.2	23.1	7.7
Grabs small objects with both hands	30.8	61.5	7.7
Grabs small objects with left hand	61.5	30.8	7.7
Grabs small objects with right hand	38.5	46.2	15.4

Discussion

The present research with parents/caregivers of children showed a mean age of 9.30 years, with a mean time of approximately three years of rehabilitation using equine-assisted therapy. In a survey conducted by Rosan, Braccialli and Araujo[13], six primary caregivers of individuals practicing equine-assisted therapy participated, aged between 3 and 11 years, with diagnosis of cerebral palsy, who performed the treatment totaling 12 sessions with weekly frequency, for 9 months. In the study by Moraes et al.[14], 15 children with CP, aged between 5 and 10 years, who underwent treatment twice a week, comparing during 12 and 24 sessions, participated.

A pre and post-intervention study analyzed by the Pediatric Questionnaire on quality of life (PedsQl), conducted with children with CP related to health, and showed that there is a significant difference in the total score, with increased score for the psychosocial domain (which has the social, emotional and school activity aspects). The PEM-CY (Participation and Environment Measure for Children and Youth) questionnaire, which evaluated the participation of children diagnosed with CP at home, at school and in the community, allowed observation of significance in relation to participation in the community and an increase in scores of participation at home and at school[13], corroborating the results of this study in relation to the social interaction of children.

In a survey conducted with companions/guardians of children, who were also submitted to treatment through equine-assisted therapy, improvement was observed in posture (100%), balance (90%), social interactions (80%), mood (80%) and also self-confidence (80%). Some participants also reported improvement in their self-esteem, autonomy and emotional independence. In addition, there was an improvement in social interactions in school activities, in communication with other people, with also the report of greater security and even a reduction in the frequency of crying[15].

The significant difference analyzed in this research between treatment time and the improvement of the child's ability to sit with support is confirmed when compared to another study that analyzed the effects of equine-assisted therapy on postural balance and functional capacity of

children with CP, showing improvement of balance in the sitting position, based on measurements obtained in the laboratory using a force platform, also resulting in considerable changes in dynamic balance, with more expressive effects after 24 sessions when compared to 12 sessions[14]. Another study states that, after 30 sessions of equine-assisted therapy, lasting 30 minutes, there was a significant improvement in children with cerebral palsy in relation to the functional ability to perform motor tasks in the sitting position ($p=0.01$)[16].

A study that evaluated the alignment and symmetry of the pelvis, spine, trunk, shoulders and head, before and after the session with equine-assisted therapy, analyzed the relationships between the means of pre-tests and post-tests in relation to the head and neck and showed significant differences ($p<0.0001$), resulting in a body benefit of 73%. Related to the shoulder and scapula, there was also significance, resulting in the benefit of 1.93 times in relation to trunk posture. The study reports that the greatest postural benefits obtained were in the trunk (93%) and pelvis segments (114%), while the smaller ones were head and neck (73%), and shoulders and scapula (84%), resulting in significant postural changes[17].

After evaluating the static and dynamic balance, body posture, gait and independence of a child with cerebral palsy who had never performed equine-assisted therapy, an improvement of 50% was observed after 12 sessions, in addition to improving the safety of the practitioner during the sessions and when walking and sitting alone already in the fourth session[18].

The present study was an analysis of the perception of the caregiver in relation to the response to treatment through equine-assisted therapy in children with CP, and its design does not allow to verify the effectiveness of the technique, but the perception regarding the treatment performed, thus being considered a limitation of the study.

Conclusion

Parents/caregivers realized benefits from the treatment of equine-assisted therapy, especially in the social interaction of children at home, at school, in their self-confidence and interaction with other children, and in motor development, mainly through the trunk control analyzed by the ability of the child to sit with support and motor functions of daily life.

Authors' contributions

The authors approved the final version of the manuscript and self-declared responsible for all aspects of the work, including ensuring its accuracy and completeness.

Conflict of interest

The authors declare that there are no conflicts of interest.

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