# 104 - EVALUATION STANDARD DOS OF MARCH AND CORPORAL POSTURE PRACTICING DOS OF THERAPEUTIC HORSEBACKRIDING WITH CEREBRAL PARALYSIS

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**INTRODUCTION**

The motor work in therapeutic horsebackriding it potentiates the balance and the muscular force through the stimulation of the systems proprioceptivo, college entrance exam and sensorial-motor (LERMONTOV, 2004).

The cerebral paralysis (PC) it is a chronic encephalopathy no progressive, but frequently changeable, of motor disturbance posture secondary to the lesion of the brain in development. The harmful event can happen in the period pre, peri or powder-native (NELSON ET AL, 1994)

As the semiology, it is divided in: tetraplegia, diplegia, paraplegia, triplegia, hemiplegia or monoplegia. Already as for the involvement type it is divided in espática, atáxica, atetosica and mixed (LEVITT, 2001).

Due to the great alterations presented by the bearers of cerebral paralysis, Cittério (1999) it emphasizes the importance of a precocious treatment with the purpose of counting with the advantages of the plasticity and adaptations neuronais, making possible the patient the experimentation of movements and postures to the which he would not have access due to his/her neurological picture. This same author mentions the need of a work in team and he suggests, as supporting to the base treatment, therapeutic modalities as the therapeutic horsebackriding.

Cittério (1999) he/she affirms that the patient with PC adopts postures and patterns that interfere in the motive evolution and balance, hindering the largest independence and modifying his/her life quality.

In the therapeutic horsebackriding the action of the three-dimensional movement of the horse activates displacement answers forward - back, right - left and in top-below (CITTÉRIO, 1999).

In this context, they participated in the present study, 32 patient with Cerebral Paralysis, of both goods, being 17 men and 15 women. The research type or characteristic of the research is almost pre-experimental with applied test to a group, once, previously defined as for the fundamental characteristics (CAMPBELL; STANLEY, 1979).

**OBJECTIVE**

The objective of this work was to evaluate the march pattern and the corporal posture, in therapeutic horsebackriding apprentices with cerebral paralysis, trying to relate the march and posture with the work developed in practice therapeutics of the therapeutic horsebackriding.

**METHODOLOGY**

The sampling for the present study was constituted of 32 children bearers of PC, both sex, which they were selected, in an intentional way, in the universe of those pré-enrolled of a Center of therapeutic horsebackriding for work equoterapêutico, that presented the following criteria:

1. diagnosis doctor attesting be bearers of PC;
2. individuals that had not been submitted previously to the therapy equoterapêutica;
3. conditions of favorable health to the development of the therapy, regular attendance and punctuality in the services.
4. signature of the responsible in the term of free and illustrious consent, specifying the objectives and methodology of the work, according to Resolution 196/96 of National Council of Health.

Proposed him work was approved by the committee of ethics of Education Anhanguera, being accomplished in a Center of therapeutic horsebackriding, in the year of 2007, totaling 26 treatment sessions. The volunteers were submitted to two services a week, with duration of 30 minutes each.

The volunteers were submitted to the method GMFM, that evaluates different dimensions. It was applied by a physiotherapist, that doesn't work and he/she doesn't have experience in therapeutic horsebackriding, not being involved in the present researches. Each evaluation was accomplished by the same professional before and after treatment.

The evaluation method GMFM (Gross Motor Function Measure - score 66) elaborated by Russel in 1989, it is an observation instrument standardized, validated by Palisano in 1995, servant to measure, objectively, the changes that happen in the thick motive function in bearers of cerebral paralysis (PALISANO et al, 1995). it Consists of 88 items, contained in 5 dimensions: to lie down and to roll (THE), to sit down (B), to crawl and to kneel (C), to be of foot (D) and to walk, to run and to jump (AND), being graduate in a scale of 4 points like this: 0 - it doesn't begin; 1 - it begins the movement; 2 - partially it completes the movement; 3 - it completes the movement, based on the amount of executed functions (RUSSEL et al, 1989).

After the first evaluation GMFM accomplished in the period pre-treatment, a treatment program was prepared with interdisciplinary vision, however with priority fisioterapêutica; with elaboration of exercises of posture change in ventral decubitus, passing the number with mobilization of the hip ties to reach the seating position. In some cases, depending on the espasticidade of the adutores, he/she began seating in the lateral position, passing the seating of front and of backs. The positions were increased according to the acquired relaxation, as: exercises of rotation of the waist, and prolongations, seeking the global relaxation, stimulating the trunk rectification and balance through manual activities and functions that elevate the superior members above the shoulders.

For the services in the therapeutic horsebackriding horses coachmen were used, without defined race, of 1m47cm to the 1m63cm of height, with the walking/step of small at the average distance. The choice of the used equipments (saddles, blankets and other) and strategies were addressed to the profile and need of each patient one. The used soil was the sand and eventually soil lawn. The equitador always prescribes changes of direction of the horses, circles, ascents and descents. The horse was driven sidelong and accompanied by an or two professionals therapists as: physiotherapist, physical educator, speech therapist, psypedagog and equetrian. During the session the largest priority and the patient's safety, also trying to observe the effect of the movement of the horse constantly under the pelvis and the mounted patient's trunk, in the front plan.

Later, to the 26 sessions equoterapêuticas and the second evaluation GMFM, the comparative analyses of the results of the Initial Evaluation were accomplished (AVI) and of the Final Evaluation (AVF) of the chosen method, to verify possible changes in the patients' motor picture. The instrument used for it analyzes her/it statistics was SPSS13.0, with statistics of

matched sample, whose the value of "p", that it represents the difference between the first and second evaluation was observed and to the whole, being significant (p <0,05).

All the obtained results if they owe exclusively to the treatment equoterapêutico, once, the responsible of the patients affirmed that their children didn't accomplish other therapy type in the period of the study.

The horse brings great contributions to children with cerebral paralysis in age of precocious stimulation, requesting functions neuro-muscular esteroceptivas and proprioceptivas during the exercises. In case of espaticidade, the tonicity is going decreasing in the work accomplished in soft soil and with the horse to the step, improving the functions of porture correction. When observing the knee, it is noticed the relaxation with the decrease of the tônus of the flexores, in case of tetraplegia. There are consequent increase of the sustentation base and correction of the trunk as they are worked the adutores. The use of the stirrup collaborates with function of the subsequent muscles, resulting in the preparation to the erect posture. The adaptation of a loop to the saddle promotes the improvement of the tonicity in the superior members with extension of the fist and forearm and adução of the thumb, allowing the movement of the scapular waist. The dystonia affects the muscular tono in several muscular groups and it demands very care in the treatment for being the susceptible apprentice the physical and mental stress. For a base of appropriate sustentation, the stabilization of the pelvic waist is recommended soon in the beginning of the treatment. The reduction of the hipertonia and the increase of the tono in the areas hipotônicas are observed in the posture on the horse, that sends information to the whole body for the stimulation of the receivers (XIPELL, 2004).

In the cerebral paralysis of the type diparético espástico it is already possible to register positive results in the relaxation of the adutores of the hip and iliopsoas, in the fourth therapy session. Starting from Friday, the child uses in a natural way the position in supine (lying on the back of the horse), elevation of the superior members with displacement of the animal, apprehension of toys, maintenance of the trunk. Starting from the eighth session it is possible to observe change in the behavior with significant improvements in the communication, becoming kind and accomplishing march with aid. At the end of the treatment there is the improvement of the thick motive coordination, unbalance absence, use of the hands to catch objects, appropriate movement of the inferior members, accomplishing flexing and extension of the knee and adoption of appropriate posture (BARBOSA, 2004).

**RESULTS/DISCUSSION**

The table 1 display the general picture of the results obtained before in each one of the domains of GMFM in his/her application (A1, B1, C1, D1 and E1) and after (A2, B2, C2, D2 and E2) the accomplishment of 26 sessions of the treatment equoterapêutico.

**Table 1**: I square general of the results of GMFM

| tests p | average ± DP | differentiates average | p |
|---|---|---|---|
| A1 | 32,9597 ± 19,081 | -3,3756 | 0,0005 |
| A2 | 36,3353 ± 19,519 | | |
| B1 | 27,4472 ± 17,166 | -6,9791 | 0,0005 |
| B2 | 34,4262 ± 18,505 | | |
| C1 | 26,9344 ± 18,427 | -2,5301 | 0,0005 |
| C2 | 29,4644 ± 18,321 | | |
| D1 | 17,0662 ± 17,240 | -3,3664 | 0,0005 |
| D2 | 20,4326 ± 19,610 | | |
| E1 | 9,8469 ± 11,492 | -2,1724 | 0,0005 |
| E2 | 12,0193 ± 13,665 | | |

Note: DP = I divert pattern; p = statistical significance.

In the tables 2, 3 and 4, the difference is observed between the first and second evaluation, for all the tests and with statistical significância.

**Table 2**: Values of the sample matched in domains (A,B,C,D and E)

**STATISTIC OF SAMPLES MATCHES**

| | | MEASURED | N=APPRAISED NUMBER | S. DIVERGENCE | MEASURE OF MISTAKE |
|---|---|---|---|---|---|
| A | A1= to lie dow/to roll | 32,9597 | 32 | 19,0812 | 3,3731 |
| | A2= to lie dow/to roll | 36,3353 | 32 | 19,5190 | 3,4505 |
| B | B1= sit dow | 27,4472 | 32 | 17,1656 | 3,0345 |
| | B2= sit dow | 34,4262 | 32 | 18,5053 | 3,2713 |
| C | C1= to crawl to kneel | 26,9344 | 32 | 18,4274 | 3,2575 |
| | C2= to crawl to kneel | 29,4644 | 32 | 18,3208 | 3,2387 |
| D | D1= of foot | 17,0662 | 32 | 17,2399 | 3,0476 |
| | D2= of foot | 20,4326 | 32 | 19,6101 | 3,4666 |
| E | E1= to walk to run to jump | 9,8469 | 32 | 11,4919 | 2,0315 |
| | E2= to walk to run to jump | 12,0193 | 32 | 13,6654 | 2,4157 |

**Table 3**: Correlations and significant of the samples

**CORRELATION OF MATCHED SAMPLES**

| | | N=APPRAISED NUMBER | Correlation | Sig. |
|---|---|---|---|---|
| A | A1= to lie dow/to roll & A2= to lie dow/to roll | 32 | ,987 | ,000 |
| B | B1= sit dow & B2= sit dow | 32 | ,974 | ,000 |
| C | C1= to crawl to kneel & C2= to crawl to kneel | 32 | ,989 | ,000 |
| D | D1= of foot & D2= of foot | 32 | ,989 | ,000 |
| E | E1= to walk to run to jump & E2= to walk to run to jump | 32 | ,987 | ,000 |

**Table 4**: I square general of the test of samples matched

**Test of Samples matched**

| | | Matched differences | | | | | |
|---|---|---|---|---|---|---|---|
| | | MEASURED | S. DIVERGENCE | MEASURE OF MISTAKE | 95% interval of Trust of the Difference LOW | HIGH | Sig. (2-tailed) |
| A | A1= to lie dow/to roll<br>A2= to lie dow/to roll | -3,3756 | 3,1517 | ,5572 | -4,5119 | -2,2393 | ,000 |
| B | B1= sit dow<br>B2= sit dow | -6,9791 | 4,2640 | ,7538 | -8,5164 | -5,4417 | ,000 |
| C | C1= to crawl to kneel<br>C2= to crawl to kneel | -2,5301 | 2,7686 | ,4894 | -3,5282 | -1,5319 | ,000 |
| D | D1= of foot<br>D2= of foot | -3,3664 | 3,5933 | ,6352 | -4,6619 | -2,0708 | ,000 |
| E | E1= to walk to run to jump<br>E2= to walk to run to jump | -2,1724 | 2,9754 | ,5260 | -3,2452 | -1,0997 | ,000 |

The results of this study, a significant one is observed gets better in the dimension AND, that it corresponds to the items of walking, to run and to jump, being found in this dimension the main motive difficulties, relates to the hypertonia espástica in the thigh's adutores and hipotonia of the inferior members in the bearers of cerebral paralysis. The final evaluation showed besides the significant reduction of the activity muscular water main, the symmetry in both inferior members, facilitating a larger alignment and larger control postural during the march, turning her more functional and viable.

Our results are concordant to the of Venturini et al, in 2001, they observed larger adaptation of the tonus; global increase of the muscular force; decrease of the shortenings; improvement of the mobility to articulate, mainly in trunk and pelvis; as well as independent march. Medeiros, in 2003, through the treatment equoterapêutico, they verified improvement in the climatic parameters in the walk, measured through a system of computerized analysis of the march.

Watakabe (2003), when researching 17 children with cerebral paralysis, it concluded that there was acquisition of larger movement width to articulate of abduction of the hip, suggesting that the equoterapia is effective to improve the contracting of the adutores, as well as his/her espasticidade. According to Fonseca (2004), the heat and the adaptation to the rhythm of the horse demand contraction and relaxation simultaneous of the muscles agonist and antagonists and they provide symmetry postural. Fact observed in this study, to the we obtain significant results in the dimensions (D) of being in foot and (AND) to walk, he/she runs and to jump after the therapeutic horsebackriding.

The present studies converges also with the thought of Mc Gibbon et al (1998), to the they affirm that the acquisition of larger mobility of the pelve and articulations of the column, the normalization of the tonus, the largest symmetry and better control of the head and of the trunk they can explain because some children with cerebral paralysis, after therapeutic horsebackriding sessions, walk with larger easiness and they demonstrate improvement in the global motive function.

## FINAL CONSIDERATIONS

The results pointed increase in the averages of all the appraised motive structures in the march pattern and in the corporal posture, in 32 therapeutic horsebackriding apprentices with cerebral paralysis, trying to relate the march and posture with the work developed in practice therapeutics, resulting a significant earnings, on average general, in the comparison before and later therapy.

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**EVALUATION STANDARD DOS OF MARCH AND CORPORAL POSTURE PRACTICING DOS OF THERAPEUTIC HORSEBACKRIDING WITH CEREBRAL PARALYSIS**

**ABSTRACT**

The therapeutic horsebackriding is indicated as therapy in the following cases: motor disorders caused by motoneurons injuries; cerebral injuries; evolutions and behavior disturbs and orthopedics pathologies (FREIRE, 1999). In this context, our objective of the present work was to evaluate the standard of walking and the corporal position, in practitioners of horsebackriding with cerebral paralysis, looking for to relate the walking and position with the practical work developed in the therapeutic horsebackriding Center. Participated on the present study, 32 patients with Cerebral Paralysis, of both the sex. Evaluations had been made daily before and after the therapy, using the scale of measurement of the thick motor function of patients GMFM (Gross Motor Function Measure), with 88 separate items in 5 dimensions. The instrument used for analyzes statistics was the SPSS13.0, with statistics of pair upped the sample ($p<0,05$). The results had been: in the dimension A-To lie down and to roll, the patients had gotten a significant improvement (average difference=-3,3756). In dimension B-To seat, the patients had had a satisfactory improvement (average difference=-6,9791). Once the time that found difficulties in this dimension. In dimension C-Kneeling, children had gotten with the treatment a significant improvement (average difference=-2,5301). In dimension D-To be on both Foots, the patients had presented satisfactory motor evolution (average difference=-3,3664). In the dimension E-To walk/To run/To jump the patients they had gotten greater functional profit, in relation its motor independence (average difference=-2,1724).We concludes that the results had pointed a respect increase in the averages of all of evaluated motor structures in the standard of march and the corporal position.

KEY-WORDS: Cerebral paralysis; Corporal Position marches; therapeutic horsebackriding.

**EVALUATION DES PATRONS DE MARCHE ET POSTURE CORPORELLE DE PRACTIQUANTS D´EQUINOTHÉRAPIE AVEC PARALYSIE CÉRÉBRALE**

**RESUMÉ**

L´équinothérapie est indiqué comme thérapie dans les cas suivants: affectation motrice par lésions neuromotrices: lésions cerébrales; troubles evolutifs et temperamentaux et pahologies ortopédiques (FREIRE,1999). Dans ce contexte, le but du de ce travail a été d´évaluer le patron de marche et la posture corporelle, entre les practiquants d´équiothérapie avec paralysie cérébrale , cherchant un rapport, entre la marche et posture avec le travail développé dans la practique thérapeutique d´un centre de Equinothérapie. Ils ont particié de cet étude, 32 patients avec paralysie cérébrale, de deux sexes. On a fait des évaluations avant et après la térapye en utilisant l´échelle de mesures de la fonction motrice grosse chez les patients GMFMM (Gros Motor Function Measure), avec 88 items séparés en 5 dimensions. L`instrument utilisé pour l´analyse statistique a été le SPSS13.0 avec une comparaison semblable ($p>0,05$). Les résultats ont été: dans la dimension A - Se coucher et tourner, les patients ont eu une amélioration significative (différence moyenne = -3,3756).

Dans la dimension B - S`asseoir, les patients ont eu une meilleure exécution fonctionnelle en rapport à son independance motrice (différence moyenne = -2,1724). Pour conclure: les résultats ont signalé un incrément dans les mesures de toutes les structures motrices évaluées dans le patron de marche et dans la posture corporelle.

MOTS CLÉS: Paralysie cérébrale; Marche et Posture Corporelle; Equinothérapie.

**EVALUACION DE LOS PATRONES DE MARCHA Y POSTURA CORPORAL DE LOS PRACTICANTES DE EQUINOTERAPIA CON PARALISIS CEREBRAL**

**RESUMÉN**

La equinoterapia se indica en los siguientes casos: afectación motriz causada por lesiones neuromotrices; lesiones cerebrales; disturbios evolutivos y comportamentales y patologias ortopédicas (FREIRE, 1999). En este contexto, nuestro objetivo fué evaluar el patrón de la marcha y de la postura corporal, en practicantes de equinoterapia con paralisis cerebral, buscando relacionar la marcha y la postura con el trabajo desarrollado en la práctica terapéutica de un centro de equinoterapia. Participan del presente estudio, 32 pacientes con paralisis cerebral, de ambos sexos. Se realizaron evaluaciones antes y después de la terapia, utilizando la escala de medición de la funcion motora gruesa de los pacientes, (GMFM, Gross Motor Function Measure), con 88 ítems separados en 5 dimensiones. El instrumento utilizado para el análisis estadístico fué el SPSS13.0, con estadística de muestra enparejada ($p<0,05$). Los resultados fueron: en la dimension A - Tumbado y rodar, los pacientes obtuvieron una mejoría significativa (diferencia media = -3,3756). En la dimension B - Sentarse, los pacientes tuvieron una mayor adquisición funcional, en relación a su independencia motora (diferencia media = -2,1724). Se concluye que los resultados señalaron un incremento en las medias de todas las funciones motrices evaluadas en el patron de la marcha y en la postura corporal.

PALABRAS CLAVE: Paralisis cerebral; Marcha y Postura Corporal; Equinoterapia.

**AVALIAÇÃO DOS PADRÕES DE MARCHA E POSTURA CORPORAL DOS PRATICANTES DE EQUOTERAPIA COM PARALISIA CEREBRAL**

**RESUMO**

A equoterapia é indicada como terapia nos seguintes casos: comprometimentos motores causados por lesões neuromotores; lesões cerebrais; distúrbios evolutivos e comportamentais e patologias ortopédicas (FREIRE, 1999). Neste contexto, o nosso objetivo do presente trabalho foi de avaliar o padrão de marcha e a postura corporal, em praticantes de equoterapia com paralisia cerebral, procurando relacionar a marcha e postura com o trabalho desenvolvido na prática terapêutica de um Centro Equoterapêutico. Participam do presente estudo, 32 pacientes com Paralisia Cerebral, de ambos os gêneros. Foram feitas avaliações pré e pós-terapia, utilizando a escala de medição da função motora grossa dos pacientes GMFM (Gross Motor Function Measure), com 88 itens separados em 5 dimensões. O instrumento utilizado para a analise estatística foi o SPSS13.0, com estatística de amostra emparelhada ($p<0,05$). Os resultados foram: na dimensão A - Deitar e rolar, os pacientes obtiveram uma melhora significativa (diferença média = -3,3756). Na dimensão B - Sentar, os pacientes tiveram uma melhora satisfatória (diferença média = -6,9791). Uma vez que encontravam dificuldades nesta dimensão. Na dimensão C - Ajoelhar e Engatinhar, crianças obtiveram com o tratamento uma melhora significativa (diferença média = -2,5301). Na dimensão D - Ficar de Pé, os pacientes apresentaram evolução motora satisfatória (diferença média = -3,3664). Na dimensão E - Andar, Correr e Pular os pacientes obtiveram maior ganho funcional, em relação a sua independência motora (diferença média = -2,1724). Conclui-se que os resultados apontaram para um aumento nas médias de todas as estruturas motoras avaliadas no padrão de marcha e na postura corporal.

PALAVRAS CHAVE: Paralisia cerebral; Marcha e Postura Corporal; Equoterapia.