Proposal of a multidisciplinary program for an individual with down syndrome, through activities of riding therapy, from the principles of human motricity

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ABSTRACT: The considered study was based on a program of physical activities in the riding therapy, from the principles of the psicomotricity created to evaluate the benefits gotten in the joint use of these two practical ones. The sample was constituted by a carrying child of SD with band of 5 years, and was carried through in the Equus: Center of Riding Therapy of Macae/RJ. The same was submitted to a medical and physiotherapy evaluation and later to a battery of psychomotor exercises and tests. It was observed that significant improvements in relation to the physical condition, social and psychic had occurred. It was verified that the practitioner after all the process of rehabilitation riding acquired tonic smoothing, increase of muscular strength, balance and position, flexibility, laterality, space-corporal and temporal notion, attention and memory, global and fine motor coordination, change in the personality profile presenting good temperament, actively participating of the activities with good mood, communicating and taking care of instructions, socialization and independence for locomotion and activities of the daily life. It is concluded then that the Psicomotricity allied with the Riding Therapy had resulted in the neuropsychosensomotor development of the practitioner, rescuing, reeducating and organizing the badly stimulated stages, guaranteeing the improvement of the lifequality of the carriers of Down syndrome.

Keywords: riding therapy, psicomotricity, Down Syndrome.

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INTRODUCTION

The Down Syndrome (DS) is a genetic accident of ignored cause, which happens approximately at each one or two thousand births, being known as Chromosome 21 Trisomy, because each cell of the individual possesses 46 chromosomes divided in equal 23. Therefore, in this case the bearer of this syndrome possesses his 21 pair of numbers one more chromosome resulting in 47 chromosomes. It is characterized, for a natural history and much defined phenotype aspects, being caused by the occurrence of three chromosomes 21 (trisomy), one more than the normal in its fundamental portion.

The prenatal diagnosis allows detecting that if the fetus is or not attacked by the syndrome during the pregnancy, tends as diagnosis indications: maternal age above 35 years, previous son with DS, one of the two (parents) bearers of chromosomal translocation involving the chromosome 21, and fetal malformations diagnosed by the ultrasound, altered prenatal selection tests. Not always the children with DS present all of the signs and symptoms, some present light to moderate mental retard, some do not present mental retard and they locate between the bordering and low medium strips, and other can still present the most severe retard. As for the signs and symptoms it is important to point out the following ones: muscular hypotonia, weak reflex, hyper articulability, ligament laxity, flat face profile, eyelift rifts sloping upward, small ears, flat and small nasal bridge, prominent tongue, small hands and feet with short fingers, only palmar crease, small mouth, excess nape skin, cardiovascular malformations (defects of the ventricular and atriumventricular septum, blow, among others), breathing infections (rhinitis, adenoiditis, bronchitis, bronchopneumonia), vision anomalies (squint, short-sightedness, nystagmus), hearing anomalies (deafness, functional defect of the hearing tube), hypothyroidism, osteoarticular instability (atlanto-axial instability), and late teething or teeth lackness, and a tendency to be slightly obese.

Since Hipócrates of Loo (458-370 to C) and its “Book of the Diets” we have knowledge of the physical and mental proportional benefits by the equestrian activities. Now, in the society, the deficiency and/or special needs bearer live together with the differences everyday. Using the horse as promoter of physical and mental benefits, those people get to reduce more and more their limitations annulling the differences. DS among the other deficiencies stands out for having better prognostics, facilitating this their insertion and inclusion in the social way.

Equoterapia is considered a “on horse and with the horse” treatment that has for purpose, in the health, the growth and the bio-psycho-social development, in the education has for purpose to promote the cognitive, psicomotor and affective development, through the practice of equestrian and of horsemanship techniques activities with specific knowledge in the medical and in the pedagogy fields.

This work had as base the concepts brought by the psicomotricity, that is the evolution of the reciprocal, incessant and permanent...
relationships of the neurophysiological, psychological and social factors, that intervene in the integration, elaboration and accomplishment of the human movement 6. In this sense, the study used the equoterapia as technique, being this one of the rare methods, maybe the only, that allows to live so many events at the same time, simultaneously, and in which the information and reactions are also numerous 7. The horse became the main score promoter of physical, psychic and social earnings, for presenting a similar locomotion in angles with the human march transmitting to the apprentice, gravity center displacements and tonic readjustments Zander 8. It is worth to remind that the use of the horse, including the first preliminary contacts that including the first preliminar contact and the final handling, constitutes and develops new socialization, self-confidence and self-esteem forms Medeiros 9. However, the individual should develop the behavior that will take him to the accomplishment of the task, and to integrate like this the actions and linkages that own to his reeducation 10.

The objective of this study is to present an appropriate work methodology with base in the property of the riding therapy allied to the characteristics of the psychomotor work.

**MATERIAL AND METHODS**

The research was accomplished in EQUUS - Center of Riding Therapy, located in Macaé-RJ. It was obtained the authorization and the consent of the responsible, where the same ones had the knowledge of all of the research stages. The research had as purpose to report data on the variables related to the psychomotor reeducation in a child with Down Syndrome, with activities addressed for each type of psychomotor function to be developed also focusing the incentives generated by the horse in riding therapy practice.

The sample was composed by a child, of the masculine gender, bearer of Down Syndrome with 5 year-old age group. The same should be participating in the riding therapy activities that were accomplished in the period of 6 (six) months in weekly sessions with duration of 45 minutes (forty five), where the observations were accomplished.

Initially, fir that the child could accomplish the treatment was asked a medical direction indicating the riding therapy. Therefore, the same was evaluated and presented hypotonia of both limbs (superior / inferior), deficit in the motive coordination hindering the execution of the movements, segmented march (in block with absence of dissociation of both scapular and pelvic waists), deficit in the speech and also in the psychomotor functions. It is worth to emphasize that the cognitive was preserved, however in a slow process, and the same was shown collaborative due to the last orientations by the therapists.

**INSTRUMENT OF DATA COLLECTION**

The used instruments were: the riding therapy horse (trot) for the practice, for the apprentice’s safety this was using the appropriate gear for the practice (helmet, shirt, pants, trainers or boot), the team was composed by the auxiliary guide and/or horse rider (drives the horse), the physiotherapists and the physical education teacher as mediators, auxiliaries in the lateral, grass track, ramps, control gear of the animal (complete head gear, blanket), ludic, sporting and pedagogic materials (marks, baskets, balls, colored rings).

The sessions had duration of 45 minutes and were divided in phases: the 10 initial minutes were used for the approach of horse and apprentice that always brought a carrot for the friend, as a way for the recognition and also for creation of the affectionate bond. After that first phase, the work proceeded with 30 minutes riding and the 5 remaining minutes were used for the separation phase that was sometimes accomplished in the track, now the apprentice aided in the bath and proceeded for the stall finishing the separation in fact.

In the soil the apprentice had contact with the materials as form of identification and also as initial point for the first observations, which aided in the whole evaluation process taking into account the qualitative and quantitative analysis of the gestures and movements. It is worth to emphasize that the warming and stretching are accomplished with the apprentice on the horse (mounted) and in movement, being a specific warming, that is, will be warm all of the specific musculatures for the activity and the stretching will come after, where the apprentice should follow the orientations given by the physical education coach, that will also be able to use ludic objects depending on each apprentice.

However, the activities began with the apprentice already mounted and inside of the track, and the horse accomplished rounds with the step in zigzag, accomplishing alteration in the steps making tracks turnovers with simultaneous stops, where these can happen in the beginning half or in the end of each activity or even during

**GRAPH 1:** Evaluation of the posture / balance test in two different moments before and after the rehabilitation program. The test is subdivided in: front / back / lateral balance, to Jump with one foot and with two feet, Gallop.
the course, respecting above all the limits and the apprentice’s potentialities.

The exercises followed a sequence related with the psychomotor functions, where in each session only two tests were accomplished. So that it could have a good acting and observation of the same during the activities was necessary to have attention for all of the executed movements, therefore the evaluation was an important factor for the data collection. The Battery of Victor of Fonseca was used, analyzing the following psychomotor factors: posture and balance, image and dissociation of the body, self-sufficient, perceptive visual-motricity / form perception, communication, personality profile, psychomotor tests.

The results obtained in the collection were described and discussed about the subject, because the riding therapy facilitated the acquisition of the foregoing variables, because the student reached a higher degree than before the activities program with the riding therapy, with perfect, economical, harmonious and well controlled accomplishments.

It is important to emphasize, that great part of the responsibility of the results is satisfactory, occurs exactly for the pledge, motivation and the apprentices satisfaction for they are in an atmosphere of freedom and of games. The positive reinforcement after each activity is a routine in that practice, contributing to the improvement of the self-esteem and of the socialization.

It is important to remind that for the accomplishment of all the tests and riding therapy activities, the team knew in first place to respect the limits and the apprentice’s potentialities contributing to his great acting and for his quality of daily life.

RESULTS AND DISCUSSIONS

In agreement with the demonstrated above results, it can be observed the apprentice’s earnings correlated with the different balance types, to jump and gallop, and both are the bases for an efficient motive coordination to develop a better march. Though, the activities developed by horse and with horse provided tonic adjustments, improve the strength and the balance, positively guaranteeing a better coordination of the segments. A great resource that was used during the riding therapy activities to aid in the improvement of the posture, was of putting in the track, a mirror in a height in which the apprentice could observe his posture while was riding the horse, and continually was suggested that the same observed the difference between the relaxed posture and an appropriate one. In this way, in little treatment time was noticed the change in the posture pattern. According to Lallery, the seating position on the horse with walk displacement, provokes new proprioceptive information in muscular articular, periarticular and tendon areas, different from the habitual ones, allowing the creation of new corporal outlines, being a technique of neuromuscular reeducation. According to Shkedi, the horse is an immense tactile surface in movement, and the incentive propitiated by the animal and for the horseman’s seat favors a support of axial growth and of balance facilitations for the stimulation of key points.

We can observe that the apprentice reached positive results as for the identification of the body parts / flexibilizion / dissociation, that were acquired through the works accomplished in the approach phase, that corresponds to the initial contact between the student and the horse being these crucial moments so that the same could first become fond to the animal.

The flexibility was also quite stimulated in this first phase (approach), because to the student do the recognition of the animal and of its size it was necessary that it inclined the head, the trunk and the waist, to bend over for the student can pass under the back of the animal (belly), under the head. For Teixeira, the influence of the horse provokes a rotation movement of the individual’s longitudinal axis when riding, due to the alternate and cyclical displacement of the anterior members of the animal that rotate around an imaginary line passing in the plan of the man’s center of gravity, that rotation on the corporal axis favors the scapular and pelvic waists dissociation. In the obstacles race the student and/or apprentice, in spite of having gotten better significantly, presented difficulties during the accomplishments of the tests, mainly because the student was a little obese and this factor hindered his self-confidence, agility, speed, and he get tired quickly. However, after the student passed by serious health problems that took him to lose plenty body mass, the physical education teacher redid the test and can verify that was really the excess of body mass that was disturbing and the student recovered his agility and speed, little by little feeling much less tired than previously.

The dissociation was also stimulated when the several ridings were accomplished in which the student could observe the variations of the part of the body of the horse correlated with the changes of his position, executing the comparisons and descriptions of the parts. According to Coste, the alternate exercises of muscular contraction, decontraction and relaxation, allow the child to locate...
parts of the body, unknown muscular groups, as well as the tonic variations in action in the different body areas.

The student’s gestures imitation increase, mainly because he already knew how to dissociate the parts of the body that facilitated the whole process. Were used during the riding therapy sessions, ludic resources as drawings with different expressions, music that made references to the parts of the body and that the student would have to imitate the movements accomplished by the physical education teacher also counting with the other professionals’ participation, what turned the most entertaining and pleased practice. The structuring of the body outline is a functional need for the whole adapted gesture because it constitutes an outline. The exercises that seek the restructuring of the body outline, reactivate the own development of that structure that is fundamental so much in the Gnosic (formal and intellectual outlines) as praxic points of view (outlines of motive accomplishments)\(^10\).

In agreement with the results related to the test of perceptive-motricity (graphism), the important motor earnings as the hypertonia and balance, were positive factors reached by the apprentice that resulted in his improvement in the graphism, because with those earnings he could have a better fist control, beginning to sketch lines and circles obtaining a larger rhythm and orientation on the paper.

Reminding that, for the apprentice reach those results was worked before and during the riding therapy, exercises to facilitate the acquisition of the fine motive coordination being of extreme importance for the graphism. For Coste\(^10\), by the representation of the vertical and horizontal plan of the body, it aids in the improvement of the graphism. Therefore, it was looked for resources to facilitate this process, then we used the tennis ball where he should press and to loosen the same accomplishing aprehension work and muscular invigoration of the superior members, exercises using colored clothespins (of plastic), rings and colored marks, where the clothespins were put in the rings and the student should put them in the marks in agreement with the order emitted by the mediator, and the same could use only one of the hands that should press the clothespins so the ring was liberated in the mark.

Those exercises have as purpose to work the tweezers movement, control on the segment, attention, agility, and reasoning and improve of the writing. That because the horse only went in the marks in agreement with the sequence of the marks, so will not lose points.

**GRAPH 5:** The evaluation of self-sufficient registers aspects of behavior in case as: habits at the table, Hygiene, to Dress and Mobility, compared and appraised before the program and after the program.

In most of the cases, neuromotor improvement was evidenced on the body alignment: head, trunk and hip, control of the global synergies, contraction phenomena, static and dynamic balance. In relation to the neuropsychological level it was noticed an increase of the attention times, a better orientation capacity and space organization, a larger expression capacity, execution and a better canalization of the aggressiveness\(^12\).

Regarding the form / organization, the student started to show improvement with continuity, acquired changes in the paper orientation and better definition of the drawings. To facilitate the organization the student can count with the ludic resources of the track, with the orientation of the mediator it could observe the form in that were located the lines (horizontal position) being a one higher and other lower, the marks in vertical position, the basketball table in the vertical position in relation to the soil. Therefore, it is valuable to remind that for the student obtaining of the notions of right / left organization and top / below and vice-versa, the same was provided by the incentives of the three-dimensional movements of the horse, as well as the ludic activities stimulating the acquisition of the laterality that contributed to the improvement of those results.

Shkedi\(^13\) confirms to us the usefulness of the horse as therapeutic instrument, could favor the development of the functions of the human nervous, psychological and social systems.

As it can be observed in the graph above, corresponding to the habits of self-sufficiency, the student / apprentice in the beginning was totally aid dependent to pick a glass of water and to drink without spilling, to uncoil the cover of the cookie pot, to go up the sidewalk of the room he had to sit down, to rotate and he needed aid to get up.

The improvement of his motive coordination, autonomy and safety, both guaranteed through the riding therapy activities, where the student was forced to respect the limits imposed by the horse and when was asked so that he guided the animal without any help, breaking his insecurity and rescuing his potentialities, positively favored to execute his actions with more independence. Therefore, after this whole process, with the help of his mother that also made her observations at home, she told that his son had already begun to eat using appropriately the spoon and/or fork, to hold the glass without spilling the water, to go alone to the bathroom, getting dressed in an appropriate way. It is worth to emphasize

**GRAPH 6:** In this graph we obtained the result of the socialization (house activity and ludic activity) and communication (numbers differentiation, psychomotricity and language). Such tests are related to the understanding with the environment and were appraised before the riding therapy and after the program with the riding therapy.
that the apprentice adores when is snack hour, moment that he catches his food pack, sits down alone without any help, opens his towel and the cookie pot and takes his juice and/or water without spilling anything, goes up / goes down paved stairways and plays football.

According to the obtained results, the apprentice passed of a dependent level for an appropriate level in the differentiation because he was quite stimulated, and also because in the riding therapy the same had access to a diversified ludicity and the student was capable to differentiate the size of the objects, discriminating colors, to identify right / left in the own body, to distinguish between short and long, heavy and light, to count from 1 to 10, capable to give one or more objects, classifying the objects in order of the smallest to larger sizes.

The integration of the tonicity, balance, lateralization and body notion in the space and in the time grants to the movement of superior psychic organization, interrelating and integrating several other previously lived and structured subsystems. The reference and the proprioceptive feedback is, consequently, crucial to the elaboration of the praxias and it is exactly this co-integration of neuronal systems that doesn’t act properly in the child with learning difficulty.11

The apprentice got to give an important step in relation to the language, because the same had access to a diversified ludicity and the student was capable to differentiate the size of the objects, discriminating colors. Because for Gruspun (1966), the learning is executed through the social conviviality, the continuous stimulation, the individualized service and with the most possible tangible material and in three dimensions, escaping from the blackboard and verbal explanations.

In the language area, riding a horse, according to Dr. Anita (that integrated the team), helps in the acquisition of all of the basic school abilities and in the thought elaboration that requests the use of both hemispheres. It is the motivation to ride that stimulates the child to progress with orders and space and time sequences. Riding helps to develop abilities and school attitudes when the child has learning difficulties.13

In the psychomotoric the student obtained positive results, because to join the psychomotor approach in the riding therapy, makes possible the inclusion of several methods of school teaching doing with that the child learns how to understand, to express, to communicate with pleasure and with freedom without the need to imposing him as many rules as are in most of the schools, naturally favoring for the child to be discovered living his own experiences and being valuable for the riding therapy works.

To ride helps in the acquisition and in the development of the psychomotor functions, which provides the learning and the development of cognitions of superior order that refer to the abilities: formation of concepts, problems solution, critical thought and creativity.16

The results point positive changes as for his personality / socialization profile through the riding therapy, because before (regarding the horse materials and ludic materials) when the student requested for help, it was denied. After the intervention of the riding therapy, the student are more comfortable with most of the people, becoming a child with good temperament, being constantly calm and balanced, more cooperative with the people, responsible with his materials, more active and helpful.

Being known that the riding therapy promotes a total freedom, making possible the expression, the spontaneity, the knowledge of the potentialities and limitations, is justified the importance of this practice for the development in several aspects, being of emotional, social, intellectual and physical character.17

This way, it can be made the connection with the riding therapy when the adaptations are part of this method, because the cerebral circuits are not just receptive to the results of the first experience, but repeatedly flexible and susceptible to be modified by continuous experiences.

It fits to emphasize, that great part of the responsibility of the results is satisfactory, occur exactly by the pledge, motivation and satisfaction of the apprentices, for they are in an atmosphere of freedom and games. The positive reinforcement after each activity is a routine in that practice, contributing to the improvement of the self-esteem and socialization.

CONCLUSION

It can be concluded that the riding therapy is of extreme importance, not only to facilitate the acquisition of the psychomotor functions, as well as seeking to present this practice and/or activity that transforms the recreational pleasures to ride a horse in physical, psychic and social benefits.

In that way it is possible to learn by the body, because it is starting from the three-dimensional movement of the horse that is possible to establish a corporal dialogue promoting tonic adjustments, balance and posture, flexibility, laterality, space-corporal and temporary notion, attention and memory, global and fine motive coordination, change in the personality profile and socialization in the bearers of Down Syndrome.

Besides, the psychomotoric is the starting point in what refers to the human movement, because since we were born we are taken to move and develop so that we can improve the acting of our movements in the course of time.

Therefore, the psychomotoric allied with the riding therapy resulted in the apprentice’s neuro-psycho-sensor-motor development, rescuing, reelaborating, reeducating and organizing the badly stimulated stages of the same.

The riding therapy for its bio-psycho-social inclination is a practice and/or activity of multiple inclusion, being indispensable for the human beings’ social inclusion of all whose divine purposes didn’t allow to enjoy life in fullness, guaranteeing the improvement of the life quality of people that are deficiency bearers and/or of special education needs.

Finally, it is stood out that the right to be different demands much more than tolerance and respect, but also practices that allow to the deficiency bearers and/or of special needs, the right of winning obstacles and of exercising his citizenship in the society.
The riding therapy is a practice that gives opportunity to this progress when revolutionizing the qualification, rehabilitation and social inclusion of all, because we all are same in the eyes of the law.

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