82 - THE VALUE BETWEEN TWO PHASES OF POSTURAL REEDUCATION TREATMENT FOR ADOLESCENTS BODY DEVELOPMENT

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INTRODUCTION

The adolescence is highlighted by a change from childhood to adulthood, going through various physical, cognitive and psychosocial changes. The beginning of this phase is also known as puberty, for it is a phase in which the growth process is intensified and the maturity is established (PAPALIA, OLDS, 2000, PIKUNAS, 1979). There is reorganization in the body scheme, where there is a bone system growth, on human heights, offal, heart, lung, sex organs and on the so-called secondary sexual characters. And due to this fact, this phase of development may be convenient to a discrepancy of psychomotor factors, that is, the efficiency and motor coordination may sporadically cause some dyspraxia and mimic and gesture incapability, space dysmetrias, temporal dyssynchronies and posture instabilities, in which for Pikunas (1979), the latter happens due to a weak posture (FONSECA, 2008).

This body disproportion causes in adolescences shame and shyness, due to a feeling of self-esteem lack in relation big or small breasts, big or small human height, among others (FONSECA, 2008, MILLER, 1981). Due to this modifications, Oliver (1999) comments on "normal" everyday body postures that begin to make structural alterations on the skeleton and soft tissues. E Rebolho (2005) concludes by saying that the majority of body posture and pathological alterations may increase during this period.

Based on this fact, in order to reeducate a body posture, there needs to be a treatment that stimulates the motor learning. Therefore, according to Cohen et al (1993), Donoghue (1995), the combination between sensor stimulation and execution of motor gesture brings a new order in the neural configuration, in special, during motor task learning process. This inner representation may increase the efficiency of synaptic force of neurons, in cortical and sub-cortical areas, causing the sensor system, responsible for getting information from the internal and external environment, to improve the internal reference or the body posture perception.

According to Lo et al. (2009), Nadeau et al (2003), Silvia et al. (2008), since the posture control is considered a complex motor ability, derived from the interaction of the neural and skeletal muscle systems, the reeducation of an adolescence, in this sense, must contemplate a reconfiguration of the neural components that embrace the motor processing, the sensory processing, the internal representation and the high levels of processing, essential to the adaptive and anticipated aspects of the posture control. Therefore, it is considered for the cerebral stimulus with binaural beats, a possible medium option of this control.

So, for Cardoso (2007), Fonseca et al. (2008), Gendirier (1995), Nadeau et al (2003), the brain stimulation thanks to binaural beats, has a goal of producing changes on the cortical patterns or on the rhythms of the brain, creating opportunities for an improvement over its profit.

Taking into consideration what has been talked about earlier, this research had a goal of evaluating the efficiency of a physical therapy treatment program, by means of the Reeducation body posture technique combined with the cerebral potentiality applied to 12 adolescents of both genders, between 11 and 15 years old, who show alteration on the sensor motor system and struggle in keeping an adequate body posture.

METHODOLOGY

RESEARCH TYPOLOGY

The actual research was developed through a sketching or experimental format, considering that an experimental research consists in determining a research object, select the variables capable of influencing it, define the forms of control and observation of the effects that the independent variable produce directly on the dependent variable, this being applied in an evaluation before (pre-test) and in an evaluation after (post-test) the intervention application.

UNIVERSE

This research was applied after medic request, on 12 adolescents of both genders and between 11 and 15 years old, held at the Vallinoto Consultório Médico Clinic, in the city of Belém, for application of physical therapy, as they showed struggle in keeping their postures in the right position, and according to the Formulaic Sampling Theory, have formed a census-denominated group, seen that it is about all of the adolescents from this place, who presented this characteristics (COCHRAN, 1956).

RESEARCH ETHICS

The project of this research was submitted to the Committee of Ethics in Research, involving Human Beings from the Castelo Branco University (UCB/RJ/Brazil) and approved under the protocol of nº 0154/2008. Under these conditions, the collection of data had gone according to the resolution of 196/96. Therefore, initially, it was requested the authorization from parents or people responsible so that this research could be developed, through a Free and Clarified Consent Term, explaining the nature of this research.

EVALUATION PROCEEDINGS

As methodological strategy of evaluation, it was used posture evaluation software (SAPO). Specific points were analyzed in the anterior view: left and right drafts, left and right acromions, left and right anterior superior iliac spine. The evaluation of the anterior view is part of a research, where there other points have been analyzed, as superior and side views, however, for this article, it was used only the anterior one. For image capturing and evaluation, the default pattern of SAPO was followed, available on http://sapo.incubadora.fapesp.br/portal.

INTERVENTION PROCEEDINGS

The operation of the physical therapy intervention program was applied using a sensor motor stimulation on cortical

level with application of postural reeducation, being applied in 20 sessions, split in two phases: the first phase belongs to the 10 first sessions and the second phase belongs to the 10 final sessions, with 90 minutes length-duration each, of which 30 minutes being used for sensor motor stimulation in cortical level and 60 remaining minutes destined to the application of postural reeducation.

SENSOR MOTOR CEREBRAL STIMULATION ON CORTICAL LEVEL

For the execution of the referred stimulation, each adolescent received a CD player of Brithania brand with stereo earphones, as well as a CD with the whole adequate schedule composed of binaural pulse beats on alpha frequencies between 8 and 13 HZ, which corresponds to the right stimulation for learning with 30 minutes length-duration (CARDOSO, 2007).

During the application of the sensor motor stimulation on cortical level, the adolescents were oriented to stay on a comfortable position, in a ventilated room of 9 m² wide, and to pay attention to hanged posters that demonstrated right situations of posture control, following the principle of imagination of the movement or neurofeedback, therefore, it was always applied before the application of postural reeducation.

POSTURAL REEDUCATION

The application of the postural reeducation sessions began from the methodology of the treatment recommended by Philippe Souchard (Global Postural Reeducation - GPR), through execution of "true frog on the floor", "true frog in the air" and "feet in the middle" postures. The first two postures were chosen because, according to Souchard (2003), they are more integral and offer greater handling to the physical therapist in relation to the zones that will be treated. The last one, on the other hand, was chosen because it has greater influence on gravity, is the most physiologic, which brings the corrections to the equilibrium for having the feet in support position during the corrections. These postures proportionate a larger activation of the neural mechanisms responsible for controlling the muscles that perform maintenance of a correct posture.

The 60 minutes of the intervention session were based on reorganizing, operationally and functionally, the fundamental movements for the execution of a control posture. This kind of treatment makes possible for the adolescent to take consciousness of the motor actions that constitute the gesture of a motor task to be accomplished, therefore, allowing, greater efficiency on the performance of both.

RESULT

The table 1 contains the evaluation for the head horizontal alignment (n=12) based on quantitative variables, applied by the Wilcoxon test for samples, comparing the pre-test evaluation with the intermediate test (p-value = 0.0022*) and showing a tendency to evolve with a major improvement of reduction of posture alteration; and when there were comparisons between the intermediate evaluation and the post-test (p-value = 0.0033*), the improvement remained significant, showing that there was a motor learning and a posture development. This fact probably occurred due to a stretching between the head aligning-muscles, that according to Kapanji (2000), occurs because of the unilateral contraction of the four occipitofrontalis muscles, mainly due to the contraction of the inferior oblique that has as a fixed spot the transverse apophysis of the atlas, which is stabilized by the external oblique and by the contraction of the larger straight muscle (which is less efficient than the internal oblique) and the minor straight (almost doesn't act); and by the unilateral contraction of the longer muscles, side straight and anterior straight of the head (CALAIS-GERMAIN, 2002).

Table 1: Evaluation of the head horizontal alignment, ANTERIOR, (n=12) based on quantitative variables.

	AVALIAÇÕES		
	Pré-teste	Intermediário	Pós-teste
Mínimo	2.3	0.0	0.0
1Q	3.5	1.3	0.0
Mediana	3.8	1.8	0.2
Média	4.3	2.2	0.4
3Q	4.4	2.8	0.6
Máximo	8.3	6.1	1.3
Desvio Padrão	1.7	1.6	0.5
Coeficiente de Variação	40%	74%	127%

Fonte: Protocolo da pesquisa
pvalor (Pré-teste x Intemediário) = 0.0022*
pvalor (Intermediário x Pós-teste) = 0.0033*

The table 2 contains the evaluation of the acromions horizontal alignment (n=12) based on quantitative variables, applied by the Wilcoxon test for samples, comparing the evaluation of the pre-test with the evaluation of the intermediate one (p-value = 0.0022*) and showing a tendency to evolve with a significant improvement of the reduction of posture alteration; and when there were comparisons between the intermediate and post-test evaluations (p-value = 0.033*), the improvement remained significant, showing there was a motor learning and a posture development (table 2). This evolution may have occurred due to an equilibrium between the shoulders, mainly because of the stretching of the trapezium and pectoralis minor muscle and also because the posture of arm chosen was the one that caused larger numbers of compensations or symptoms in relation to posture alteration in which the adolescent presented. (CALAIS-GERMAIN, 2002, SOUCHARD, OLLIER, 2004)

Table 2: Evaluation of the acromions horizontal alignment, ANTERIOR (n=12) based on quantitative variables.

	AVALIAÇÕES		
	Pré-teste	Intermediário	Pós-teste
Mínimo	0.8	0.0	0.0
1Q	1.5	0.7	0.0
Mediana	2.4	1.3	0.2
Média	2.4	1.4	0.3
3Q	3.1	2.2	0.5
Máximo	5.1	3.2	0.8
Desvio Padrão	1.3	1.0	0.3
Coeficiente de Variação	53%	70%	120%

Fonte: Protocolo da pesquisa
p-valor (Pré-teste x Intermediário) = 0.0022*
p-valor (Intermediário x Pós-teste) = 0.0033*

The table 3 consists of the evaluation of the anterior superior iliac spine (ASIS) horizontal alignment (n=12) based on quantitative variables, applied by the Wilcoxon test, for samples, comparing the pré-test evaluation with the intermediate evaluation (p-value = 0.0022*) and showing that there was a tendency to evolve with a significant improvement on the reduction of posture alteration; and when there were comparisons between the intermediate and post-test evaluations (p-value = 0.0033*), the improvement remained significant, showing that there was a motor learning and a posture development (table 3). This episode may have been caused by an improvement on the equilibrium between the hip muscles, of which there are: the hamstring, abdomen wall, iliopsoas, pelvi-trochanteric, since the angles have become more balanced. So, according to Cailliet (2003) the hamstring are stabilizers of the pelvis in the static position and according to Souchard (2004), Tribastone (2001),

Bienfait (2000), Lewit (2000), the flaccidity of the iliopsoas causes lumbar hyperlordosis, causing the anteversion of the pelvis and the pelvi-trochanteric, like the piriformis muscle, femoral square, obturator internus muscle and the twin of the hip, does the retroversion. (CALAIS-GERMAIN, 2002)

Table 3: Evaluation of the ASIS horizontal alignment, ANTERIOR, (n=12) based on quantitative variables.

	AVALIAÇÕES		
	Pré-teste	Intermediário	Pós-teste
Mínimo	1.7	0.6	0.0
1Q	2.4	1.3	0.0
Mediana	3.0	1.5	0.6
Média	3.5	1.7	0.6
3Q	4.2	1.5	0.7
Máximo	7.8	4.3	2.4
Desvio Padrão	1.7	1.1	0.7
Coeficiente de Variação	48%	66%	112%

Fonte: Protocolo da pesquisa
p-valor (Pré-teste x Intermediário) = 0.0022*
p-valor (Intermediário x Pós-teste) = 0.0033*

Fonte: Protocolo da pesquisa
p-valor (Pré-teste x Intermediário) = 0.0022*
p-valor (Intermediário x Pós-teste) = 0.0033*

This improvement probably occurred due to the presence of an equilibrium between the muscle chains, because, according to Marques, Mendonça, Cossermelli (1994), RPG is a method that oversees the acknowledgement of one's own body through a bodily consent, thus healing, rigidity and inflexibility present in physical and psychic level, considering the body as a whole. The results might have succeeded thanks to the usage of simultaneous hearing stimulation, since this help upon motor learning (CARDOSO, 2007; MARQUES et al., 2006; SILVIA et al., 2008).

The association between GPR and cerebral potentiality made possible the opportunity to treat postural alteration, with both physical practice and mental practice, and, according to Oliveira, Salina, Annunciato (2001) mental practice of a physical ability have been used to help upon the development of a routine already learned and on obtaining a motor ability. And the inner reproduction of a motor act (mental simulation) may be repeated extensively with the intent of provide learning or improvement of a motor ability (HAMZEI et al., 2006; VIEL, VAUGOYEAU, ASSAIANTE, 2009).

In regards of these facts, it's important to notice that the motor learning corresponds to the acquisition of new knowledge and consequent modification of behavior, as long as the memory may be interpreted as the retention of this knowledge. Therefore, with the sensor motor stimulation in cortical level, both processes connect themselves through specific neural mechanisms, that makes possible the combination between sensor memory (sensor stimulation), short-term memory (working memory) and long-term memory, represented in the nervous system through consolidation and execution of motor gesture, leading to a new sequence in the neural configuration (CARDOSO, 2007).

CONCLUSION

It may be said that operating the intervention through postural reeducation combined with sensor motor stimulation on cortical level, it was created a scenario propitious to the maturity of cortical motor areas. This event may be proved with the improvement on the first phase and on the second phase, confirming the values or the positive effects of this kind of intervention.

Because of what can be understood about value is a structural quality of metaphysical nature that corresponds to all that (in the case, the referred physical therapy intervention) fills positively a complex state of loneliness, privation or gap (improving the alterations of sensor motor mechanisms responsible for the posture system) of a human being (in this case, adolescents between 11 and 15 years old).

Lastly, the comparison between the two phases of intervention served to demonstrate that even if the adolescent obtained success in the first phase, he/she had a better improvement on the second phase. This episode shows that there needs to be an attendance of the adolescent's development, due to the fact that adolescence is a period full of transformation, causing posture instabilities. Thus, there must always be evaluations to attend the evolution of the posture, so that the treatment may last, attending growth in order to avoid future articulation, bone and muscle diseases. Souchard (2003) says that the total duration of the treatment of an adolescence that has got an evolving scoliosis, may be applied in some series of consultation, between 12 and 15, distributed in years.

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THE VALUE BETWEEN TWO PHASES OF POSTURAL REEDUCATION TREATMENT FOR ADOLESCENTS BODY DEVELOPMENT

ABSTRACT:

The goal of this research was to evaluate the efficiency of a physical therapy treatment program, under the postural reeducation technique combined with the cerebral potentiality, applied to 12 adolescents of both genders, between 11 and 15 years old, who showed alteration in the sensor motor system and struggle in keeping an adequate body posture, evaluated before and after intervention, under the SAPO technique. The intervention in question took 20 sessions, the first phase being the 10 first sessions and the second phase, the 10 final sessions, with medium length of 90 minutes each, 30 minutes for cerebral potentiality, under the binaural heart beats on the alpha frequencies between 8 and 13 HZ and 60 minutes of postural reeducation, using the Philippe Souchard method, on the positions of ''true frog in the air'', ''true frog on the ground'' and ''feet in the center''. The obtained results on the post-intervention of the two phases showed, through resources of descriptive statistic, an improvement in the head alignment, acromions, anterior superior iliac spines, angle of the scapula and the T3 vertebra, with consequent improvement on the body posture.

KEYWORDS: Postural Reeducation, adolescents, cerebral potentiality.

VALEUR ENTRE DEUX PHASES DE TRAITEMENT DE RÉÉDUCATION POSTURALE POUR LE DÉVELOPPEMENT DU CORPS DES ADOLESCENTS

RÉSUMÉ:

Le but de cette étude était d'évaluer l'efficacité d'un programme de thérapie physique, en utilisant la technique de rééducation posturale combinée avec une amélioration des cerveaux sur 12 adolescents les deux sexes, âgés de 11 à 15 ans qui ont des changements dans le système sensori-moteur, et la difficulté à maintenir une posture adéquate, mesurée avant et après l'intervention, à travers la SAPO technique. L'aide en question a été documentée dans 20 sessions, avec la première phase a été les 10 premières sessions et la deuxième phase au cours des 10 dernières séances, d'une durée moyenne de 90 minutes chacune, et 30 minutes de mise en valeur du cerveau, par l'intermédiaire pouls bat binaural fréquences alpha entre 8 et 13 Hz, et 60 minutes de rééducation posturale, en utilisant la méthode Philippe Souchard dans des positions "grenouille dans l'air", "grenouille sur le plancher" et " pied au milieu". Les résultats obtenus dans l'après-intervention a montré les deux phases, par des produits de la statistique descriptive, un meilleur alignement de la tête, acromions, épines iliaques antéro-supérieure de l'omoplate et la vertèbre 13 traduisent par une posture améliorée.

MOTS-CLÉS: rééducation posturale, les adolescents, amelioration des cerveaux .

EL VALOR ENTRE DOS FASES DE TRATAMIENTO DE REDUCCIÓN POSTURAL PARA EL DESENVOLVIMIENTO CORPORAL DE ADOLSCENTES

RESUMEN:

El objetivo de este estudio fue evaluar la eficacia de un programa de tratamiento fisioterapéutico por medio de de la técnica de Reducción Postural combinada con la potencialización cerebral realizada en 12 adolescentes de ambos sexos, con edades entre 11 y 15 años, que presentan alteración del sistema sensorio-motor y dificultad en mantener una adecuada postura corporal, evaluada anterior y posteriormente a la intervención, por medio de la técnica SAPO. La intervención mencionada se desenvolvió en 20 sesiones, siendo que la primera fase fue en las 10 sesiones iniciales y la segunda fase en 10 sesiones finales,

con duración media de 90 minutos cada una, siendo 30 minutos de potencialización cerebral por medio de batimientos de pulsos binaural en las frecuencias de alfa entre 8 y 12 HZ, y 60 minutos de reducción postural utilizándose el método Phillippe Saouchard, en las posiciones de “rana en el aire” , “rana en el suelo” y ” pié en el centro” . Los resultados obtenidos en la pos intervención de las dos fases mostraron por medio de recursos originados en la estadística descriptiva una mejora en la nivelación de la cabeza, acromios y espinas ilíacas antero-superiores, ángulo del omóplato y de la vértebra T3, con consecuente mejora en la postura corporal.

PALABRAS LLAVES: re-educación postural, adolescentes, potencialización cerebral.

O VALOR ENTRE DUAS FASES DE TRATAMENTO DE REEDUCAÇÃO POSTURAL PARA O DESENVOLVIMENTO CORPORAL DE ADOLESCENTES

RESUMO:

O objetivo deste estudo foi avaliar a eficácia de um programa de tratamento fisioterapêutico, por meio da técnica da Reeducação Postural combinada com a potencialização cerebral realizada em 12 adolescentes de ambos os sexos, com idade de 11 a 15 anos, que apresentam alteração no sistema sensório-motor, e dificuldade em manter uma adequada postura corporal, avaliada anterior e posteriormente à intervenção, por intermédio da técnica SAPO. A intervenção em questão se desenvolveu em 20 sessões, sendo que a primeira fase foi nas 10 sessões iniciais e a segunda fase nas 10 sessões finais, com duração média de 90 minutos cada, sendo 30 minutos de potencialização cerebral, por meio das batidas de pulso binaural nas freqüências de alfa entre 8 e 13 HZ, e 60 minutos de reeducação postural, utilizando-se o método Philippe Souchard, nas posições “rã no ar”, “rã no chão” e “pé no centro”. Os resultados obtidos na pós-intervenção das duas fases mostraram, por meio de recursos advindo da estatística descritiva, uma melhora no alinhamento de cabeça, acrômios, espinhas ilíacas ântero-superiores, ângulo da escápula e da vértebra T3, com conseqüente melhora na postura corporal.

PALAVRAS-CHAVE: reeducação postural, adolescentes, potencialização cerebral

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