
EXERCÍCIO RESISTIDO, ANSIEDADE E DEPRESSÃO EM PORTADORES DE ESCLEROSE MÚLTIPLA

Resistance training, anxiety and depression in multiple sclerosis patients

Lívia Cardoso Rosinha¹, Patrícia Greve², Nilce Helena do Nascimento³,
Priscila Garcia Lopes⁴, Cesar Augusto Calonego⁵, Silvia Regina Matos da Silva Boschi⁶

¹ Especialista em Fisioterapia Neurológica - Universidade de Mogi das Cruzes - Mogi das Cruzes, SP - Brasil, e-mail: licardoso3@hotmail.com

² Mestranda em Fisioterapia pela UFSCar - Universidade Federal de São Carlos - São Carlos, SP - Brasil, e-mail: patygreve@uol.com.br

³ Mestre em Reabilitação pela UNIFESP - Professora de Neurologia da UMC - Universidade de Mogi das Cruzes - Mogi das Cruzes, SP - Brasil, e-mail: nilhnasc@uol.com.br

⁴ Professora de Estágio em Neurologia da UMC - Universidade de Mogi das Cruzes - FAEP. Mogi das Cruzes- SP - Brasil, e-mail: pripere@uol.com.br

⁵ Mestre em Fisioterapia pela UFSCar, Gestor do Curso de Fisioterapia da UMC - Universidade de Mogi das Cruzes - Mogi das Cruzes, SP - Brasil, e-mail: cesara@umc.com.br

⁶ Doutoranda em Bioengenharia pela UMC - Universidade de Mogi das Cruzes, SP - Brasil, e-mail: ninoboschi@uol.com.br

Abstract

The benefits of performing resistance exercises are long known, and the participation on this type of exercise by Multiple Sclerosis patients is not contra-indicated if properly oriented and supervised. However, participation in such exercises and in physical activity in general promotes fear and insecurity in these patients. The aim of this research was to verify the depression and anxiety level of Multiple Sclerosis patients regarding their participation on resistance exercises; to verify anxiety impact about performing resistance exercises; and to grade insecurity factor regarding participation on resistance exercises of Multiple Sclerosis patients. Thirty Multiple Sclerosis diagnosed patients were assessed and responded to the following questionnaires: Beck Depression Inventory (BDI), Spielberger State-Trait Anxiety Inventory (STAI), and also an adapted questionnaire. The results obtained with the inventories demonstrated that 66.6% of the patients did not present any type of depression, and 66% presented moderate level of anxiety in both STAI-Trait and STAI-State. Regarding their participation in physical activity, it was observed that 86.6% of these patients did not participated in any type of activity, and only 13% were engaged in physical activity. A great portion of the patients who did not participate in physical activities (46.6%) were counseled not to do so by a health professional. It was concluded that most patients presented moderate level of anxiety and no types of depression, and insecurity when performing exercises, especially resistance exercises.

Keywords: Multiple sclerosis; Physiotherapy; Depression; Resistance exercise; Anxiety.

Resumo

Há muito tempo são conhecidos os benefícios da prática de exercícios resistidos e a realização destes por portadores de Esclerose Múltipla não é contra indicado se orientado e supervisionado corretamente. Porém, a pratica destes exercícios e de atividade física de modo geral provoca uma série de medos e inseguranças nesses pacientes. O objetivo desta pesquisa foi verificar o nível de depressão e o grau de ansiedade de pacientes com Esclerose Múltipla em relação à prática de exercícios resistidos; verificar o impacto da ansiedade para a realização do exercício resistido e graduar o fator de insegurança em relação à prática de exercícios resistidos nos portadores de Esclerose Múltipla. Foram avaliados 30 pacientes com diagnóstico de Esclerose Múltipla, os quais responderam os seguintes questionários: Inventário de Depressão de Beck, Inventário de Ansiedade Traço-Estado e um Questionário adaptado para pesquisa. Os resultados obtidos por meio dos inventários demonstram que 66,6% dos pacientes não apresentam nenhum tipo de depressão, 66% um grau mediano de ansiedade tanto na A-traço quanto na A-estado. Sobre a prática de atividades físicas, observou-se que 86,6% desses pacientes não praticam qualquer tipo de atividade e apenas 13,4% as praticam. Grande parte dos pacientes que não praticam nenhuma atividade física (46,6%) é desaconselhada por um profissional da saúde a não praticarem. Conclui-se que a maioria dos pacientes apresenta grau mediano de ansiedade, nenhum tipo de depressão e insegurança em praticar exercício, principalmente exercício resistido.

Palavras-chave: Esclerose múltipla; Fisioterapia; Depressão; Exercício resistido; Ansiedade.

INTRODUCTION

Multiple Sclerosis (MS) is a demyelinating disease of the Central Nervous System (CNS), considered the major cause of the young adults' neurological debilitation, leading to a great incapacitation (1). Early signs and symptoms of MS patients frequently demonstrate the involvement of motor, cerebellar, visual, vesical, intestinal, sexual, cognitive, and emotional symptoms, among others. In regards to the motor symptoms, it is observed: muscle weakness, occasional numbness, paresthesia, muscle spasms, gait alteration, balance loss and fatigue. Among the emotional symptoms, anxiety and depression are highlighted (2).

Among the emotional factors previously mentioned anxiety is a very common symptom observed in MS patients. To Spielberger (3), anxiety is a phenomenon of emotional nature, which manifests in two ways: *a) as a psychological state*, which is a transitory condition of intensity depending on its reaction form; *b) as a personality trait*, where anxiety is considered the basic predisposition of the person.

The possibility of correlation between anxiety and depression on MS is known for several years, however, literature is scarce and non-conclusive. These symptoms are estimated to involve 27 – 54% of MS patients during the disease's progress (4). The origin of depression in MS patients might be related to the psychological reaction towards the disease, to the cerebral area injured, and to the utilized treatment drugs (5). The cure for MS has not been discovered yet and to delay the disease's progression immunomodulators and immunosuppressors are the most utilized drugs. Along with drug treatment, Furtado et al. (5) stated that exercising may act as an allied towards the disease's treatment.

Therefore, this research aimed to verify the level of depression and anxiety of patients with Multiple Sclerosis regarding the execution of resistance exercises; to verify anxiety impact when performing resistance exercises and to grade the insecurity factor regarding the execution of resistance exercises in Multiple Sclerosis patients.

MATERIAL AND METHOD

Initially this research was approved by the University of Mogi das Cruzes Committee of Ethics. Thirty Multiple Sclerosis patients from the *Grupo do Alto Tietê de Esclerose Múltipla (GATEM)* (Alto Tietê Multiple Sclerosis Group) participated in this study. All subjects were residents of Mogi das Cruzes, São Paulo, Brazil. Exclusion criterion involved cognitive deficiency, based on a score 24 or lower in the Mini-Mental Exam (6). A consent term was obtained from all participants. After signing the consent term, the Beck Depression Inventory (BDI) (7) and the Spielberger State-Trait Anxiety Inventory (STAI) (3) were administered, along with an adapted questionnaire based on Arida et al. (2003) (8). According to the scoring norm of the Beck Depression Inventory, depression was classified as: normal, mild, mild to moderate, moderate to severe, and severe. Anxiety classification was as followed: low level of anxiety, moderate level of anxiety, and elevated level of anxiety.

Beck Depression Inventory (BDI) is a measuring instrument utilized to assess the depression state. The scale is composed of 21 items, which assess symptoms and attitudes that varies within a scoring scale of 0 – 3. The items that compose the inventory assess the following symptoms and attitudes: sadness, pessimism, guilt, lack of satisfaction, feeling of failure, lack of self-esteem, self-blame, suicidal ideation, crying spells, irritability, social retraction (disinterested in people), indecision, sleep disturbance, fatigability, loss of appetite, weight loss, somatic preoccupation, and loss of libido. Classification of depression scores are: 0-9 normal, 10-15 mild, 16-19 mild to moderate, 20-29 moderate to severe, and 30-63 severe.

The Spielberger State-Trait Anxiety Inventory (STAI) is a self-report assessment questionnaire divided into two parts: one section assesses trait-anxiety, while the other evaluates state-anxiety. Each section is composed of 20 statements, with “*state*” meaning how the subject feels at that specific time, and “*trait*” presents how the subject usually feels on a regular basis. The scores of each part varies from 20-80 points, indicating: 0-30 low level of anxiety, 31-49 moderate level of anxiety, equal or greater than 50 represents elevated level of anxiety.

Student’s t Test was utilized to verify whether a significant difference existed between STAI-Trace and STAI-State; and to analyze the correlation between these variables, the Spearman Correlation test was utilized.

RESULTS

Thirty patients participated in this research, where 70% were female subjects with the average age of 38.6 years (± 13.8), and 30% were male subjects with the average age of 40 years (± 11.1). Regarding the general sample, 85% were white and only 15% were black.

The obtained results regarding the Beck Depression Inventory demonstrated that 66.6% of the patients did not present any type of depression; 23.3% presented mild depression; 3.3% presented mild to moderate depression; and 6.6% of the participants presented moderate to severe type of depression. Severe level of depression was not manifested by any of the participants, as shown in Figure 1.

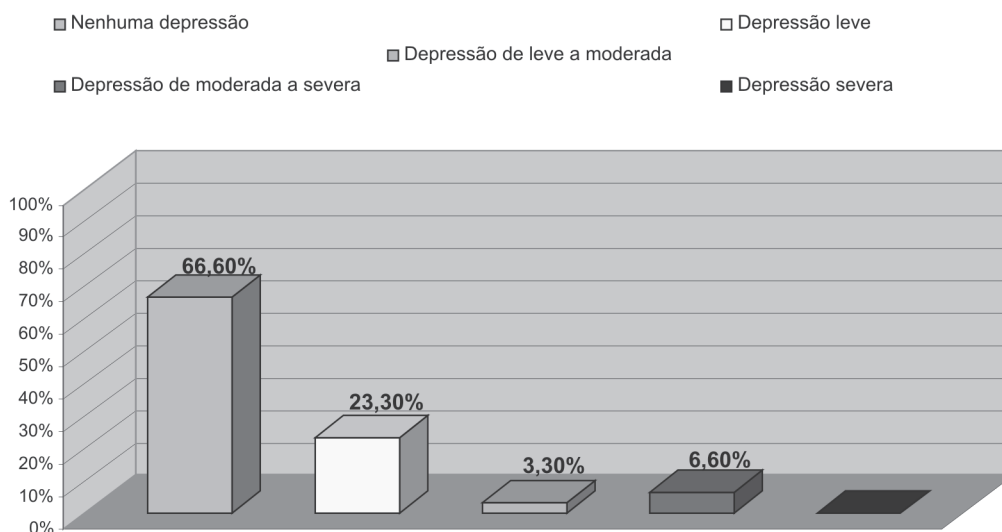


FIGURE 1 - Results from beck depression inventory in patients with multiple sclerosis

Regarding the Spielberger State-Trait Anxiety Inventory (STAI), it was observed that the average obtained in STAI-State was 36.9 ($\pm 9,7$) points, meaning a moderate anxiety level presented by the patients. Though the STAI-Trait average was greater, 38.5 (± 9.9) points, it also indicated a moderate anxiety level. To verify significant difference between STAI-State and STAI-Trait the Student's t Test was executed (level of significance = 0.05; n = 30; with $t_0 = 1.34$ and $t = 2.04$), and no significant differences were observed between the results. Regarding the correlation between STAI-State and STAI-Trait the Spearman Correlation test was applied, demonstrating $r_0 = 0,69$ ($r_c = 0,36$; level of significance = 0,05; n = 30), indicating significant correlation between STAI-State and STAI-Trait.

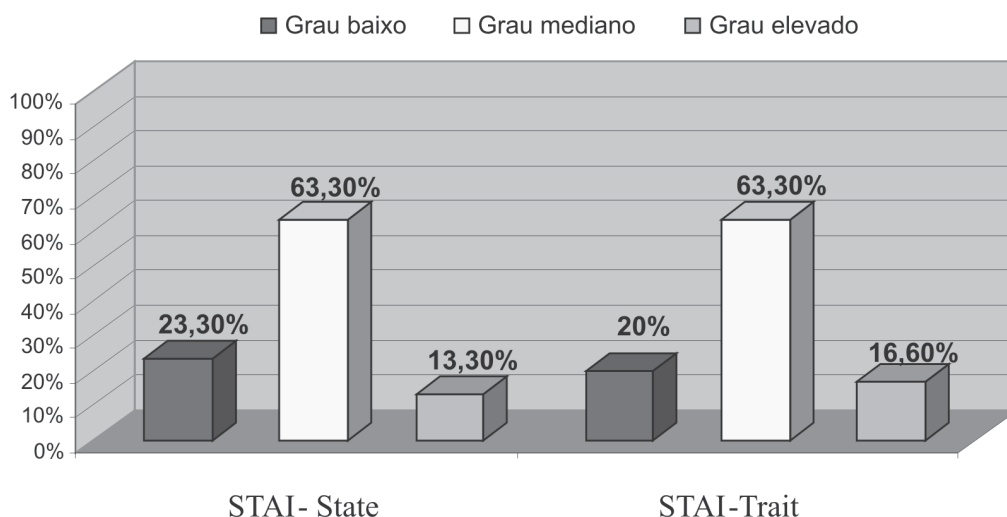


FIGURE 2 - Results from state-trait anxiety inventory in patients with multiple sclerosis

Figure 2 demonstrates the results according to the anxiety classification. It was noted that STAI-State presented 23.3% of the subjects with low level, 63.3% with moderate level, and 13.3% with elevated level of anxiety. In the STAI-Trait, 20% presented low level, 63.3% with moderate level, and 16.6% with elevated level of anxiety.

When questioned about commitment to exercises, it was observed that only five individuals (13.4%) of the patients practiced some sort of physical activity after the disease was diagnosed. A major portion of these active patients, two patients, were engaged in physical activity with a frequency of 3 to 4 times a week, one were engaged 1 to 2 times a week, and the other one were engaged more than 4 times a week. The most practiced physical activity was weight lifting, indicated by 75% of the patients, followed by walking and hydrogymnastics, each practiced by 25% of the patients respectively.

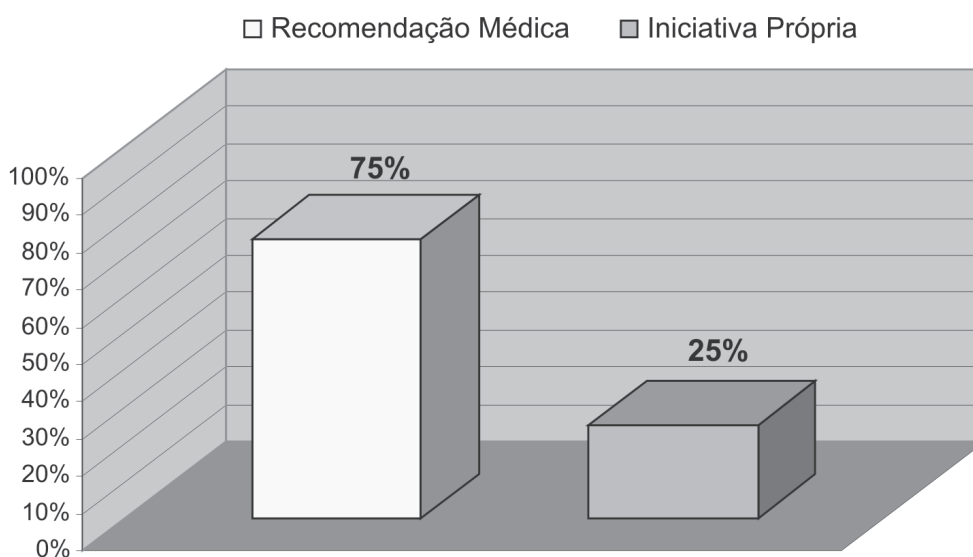


FIGURE 3 - Initiative of engaging in physical activity in patients with multiple sclerosis

It is interesting to note on Figure 3 that 75% of the patients initiated physical activity after medical recommendation, and only 25% initiated exercising by themselves. It is important to mention that all patients who practiced physical activity believed it was beneficial for their health.

The great majority of the interviewed patients (86.6%) did not practice any kind of physical activity. Regarding sporting habits previously practiced by these patients, it was observed: weight lifting (10%), swimming and soccer (6.6%), followed by volleyball, walking and hydrogymnastics (3.3% each). The three major reasons given by the patients for not practicing physical activity were: a) fear of looking stupid or clumsy (30%); b) not sure of how to start or proceed with an exercise program (30%); and c) fatigue after exercising (40%).

TABLE 1 - Fears and insecurities encountered during resistance exercise in patients with multiple sclerosis

| <i>General</i> | %* |
|---------------------------------------------------------------------------|-------|
| I don't like to practice exercises | 20% |
| I don't have the time to practice exercises | 20% |
| I am scared of looking stupid and clumsy | 30% |
| I don't have company | 23,3% |
| I am not sure how to start or how to proceed in an exercise program | 30% |
| I feel tired after exercises | 40% |
| I am scared that exercises will lead to health problems | 23,3% |
| <i>MS-Specific toward resistance training</i> | |
| I am scared that exercise might trigger seizure | 30% |
| I have had a seizure during exercise | 3,3% |
| I am scared of being embarrassed by having a seizure during the exercise | 23,3% |
| I was advised by a health care professional to avoid most exercises | 46,6% |
| My family and/or friends do not encourage me to exercise | 6,6% |
| I have heard of people with Multiple Sclerosis who seized during exercise | 6,6% |

* One patient could check more than one fear or insecurity, displaying a final percentage that exceeds 100%.

* Based on Arida et al. (2003).

Table 1 demonstrates fears and insecurities faced by MS patients who are not engaged in any type of physical activity once questioned about practicing resistance exercises. The specific queries about MS patients performing resistance exercises were responded by the ones who were not engaged in physical activities; interesting to highlight that the majority of these patients were advised by a health professional not to engage into activities (46.6%), mainly resistance exercises. Among the health professionals mentioned, physician comprised of 33.3%, and physical therapists with 13.3% of the answers. The other two fears and insecurities faced by MS patients regarding their participation in resistance exercises were the fear that exercise could cause seizures (30%), and fear of being embarrassed from having a seizure during exercise (23.3%).

DISCUSSION

Literature is rare regarding the relationship between MS patients and the symptoms depression and anxiety. Accordingly, the research in this topic is unfortunately scarce. The most frequent studies related to this topic are the studies conducted by Mendes *et al.*, who are remarkable researchers and will be extensively used in this discussion.

The obtained results about depression are similar to other studies observed in Brazil, which indicates that up to 1/3 of MS patients may present such symptoms (9). Rabins et al. (10) observed that among MS patients, the ones with cerebral injury presented higher depression scores than patients with primarily spinal cord injuries, while correlation with incapacity was not observed. The authors suggested that depression results from the association between psychological factors and the presence of cerebral injuries. It has been recently observed that MS patients who presented depression symptoms also presented injuries predominantly to their right temporal lobe; injury that was not observed on the non-depressed MS subjects (4).

The results obtained in this research demonstrated that 13.4% of the patients that did not present any type of depression practiced some sort of physical activity, with resistance exercise being practiced the most, which suggested the decreased or non-existing symptom of depression in MS patients who practiced regular physical activity. Haase et al. (9) stated that higher scores of depressive symptom are observed in medicated patients. This fact indicates that depression has been diagnosed by neurologists, however, the results point toward inefficiency of pharmacological treatment when focusing MS related depression.

Cognitive deficiency presented by MS patients may be related to the observed depression state (11). In contrast, authors who search for the explanation of MS related depression suggest that depressive symptoms do not result from the disease's progression, but because of fear and apprehension towards the diagnosis and eventual deficits that appear with the course of the disease (4). This same author mentioned above stated that although MS depression does not have a specific treatment, the assessment of this symptom is essential for the complete approach of these patients. It is difficult to define during clinical practice which one is the best assessment method. The administration of easy and comprehensible scales with items that do not merge with topics of the main disease is fundamental. Patients with MS present depression with peculiar characteristics, which may merge with sensations of fatigue and cognitive alterations (12).

Studies in the literature relating anxiety and MS are also scarce. Mendes et al. (4) found, in a study with 84 patients, a prevalence of this symptom in 35.7% of the patients with MS. In another study conducted by the same authors (12), 29 out of the 95 (30.5%) patients were detected with anxiety. In the present study, it was found out of the 30 studied patients, a moderate level of anxiety in 63.3% of the patients in STAI-State and also STAI-Trait, and an elevated level of anxiety in 13.3% in STAI-State and 16.6% in STAI-Trait. Mendes et al. (12) reported that anxiety is present in a great number of patients with fatigue, 32.8% in a total of 95 patients, although studies that associate anxiety and fatigue were not found. A similar data was found in this research, once 40% of the patients belonging to this group were not engage in any physical activity due to fatigue after practicing.

The benefits of exercise for health, as well as its positive psychological effects, are well established in the literature (13). The reduction of general physical fitness may be associated with psychiatric disorders such as anxiety, depression and negative states of mood (14). In MS patient also was evidenced that worsening of symptoms is associated with lower levels of physical activity (15). MacAuley et al. (16) report that individuals with MS are more sedentary than the general population, increasing their propensity for reduces functional ability, mobility, and activities of daily living.

Studies of the 90th suggest that aerobic exercise may be more appropriate than anaerobic exercises (17, 18). Araújo et al. (13) report that there is still no consistency among the results because of methodological changes. However, Dood et al. (19) explored the perception of adults with MS about positive and negative effects of a progressive resistance strengthening program, and identified that reports about the program were very positive with physical, psychological and social benefits noted.

Recent studies (5, 19-26,) have confirmed improvement towards fatigue, impact of fatigue, and the quality of life of MS patients, because the execution of physical exercises, when well oriented and supervised, is a feasible and useful fitness option for some people with MS (27). However, 46.6% of all patients are counseled by a health professional not to exercise.

CONCLUSION

No type of depression was found in most of these patients and only a small portion expressed mild depression, according to Beck Depression Inventory. The impact of anxiety for the practice of resistance training is median and perhaps this is one of the factors that prevent these patients from practice it. The uncertainty regarding the practice of resistance training by those people with MS is large, since a significant percentage of these patients is discouraged to pursue any kind of physical activity by health professionals, therefore afraid that the resistance training increase neurological impairment.

REFERÊNCIAS

1. O'Sullivan SB, Schmitz TJ. *Fisioterapia: avaliação e tratamento*. 3ª ed. São Paulo: Manole; 2003.
2. Nobrega F, Nogueira L. *Esclerose múltipla: uma abordagem fisioterapêutica – revisão de literatura*. São José dos Campos: UNESP; 2002.
3. Spielberger CD, Gorsuch RL, Lushene RE. *Manual for the state-trait anxiety inventory*. Palo Alto: Consulting Psychologist Press; 1979.
4. Mendes MF, Tilbery CD, Balsimelli S, Moreira MA, Cruz AMB. Depressão na esclerose múltipla forma remitente-recorrente. *Arq Neuropsiquiatr*. 2003;61(3-A):591-595.
5. Furtado OLP, Tavares MCG. Esclerose múltipla e exercício físico. *Acta Fisiátrica*. 2005;12(3):100-106.
6. Folstein MF, Folstein SE, McHugh PR. "Mini-Mental State." a practical method for grading the cognitive state of patients for the clinician. *J Psychiatr Res*. 1975;12(3):189-198.
7. Beck AT, Steer RA, Garbin MG. Psychometric properties of the beck depression inventory: twenty-five years of evaluation. *Clinical Psychology Review*. 1988;8(1):77-100.
8. Arida RM, Scorza FA, Albuquerque M, Cysneiros RM, Oliveira RJ, Cavalheiro EA. Evaluation of physical exercise habits in Brazilian patients with epilepsy. *Epilepsy & Behavior*. 2003;4(5):507-510.
9. Haase VG, Lacerda SS, Lima EP, Correa TD, Brito DC, Peixoto MA. Avaliação do funcionamento psicossocial na esclerose múltipla. *Arq Neuropsiquiatr*. 2004;62(2-A): 282-291.
10. Rabins PV, Brooks BR, O'Donnell P. Structural brains correlates of emotional disorder in multiple sclerosis. *Brain*. 1986;109(4):585-597.
11. Andrade VM, Bueno OFA, Oliveira MGM, Oliveira ASB, Oliveira EML, Miranda MC. Cognitive profile of patients with relapsing remitting multiple sclerosis. *Arq Neuropsiquiatr*. 1999;57(3-B):775-783.
12. Mendes MF, Tilbery CD, Balsimelli S, Moreira MA, Cruz AMB, Felipe E. Fadiga na forma remitente recorrente na esclerose múltipla. *Arq Neuropsiquiatr*. 2000;58(2-B):571-575.
13. Araújo SRC, Mello MT, Leite JR. Anxiety disorders and physical exercise. *Rev Bras Psiquiatr*. 2007;29(2):164-171.
14. Martinsen EW, Strand J, Paulsson G, Kaggstad J. Physical fitness level in patient with anxiety and depressive disorders. *Int J Sports Med*. 1989;10(1):58-61.
15. Motl RW, Arnett PA, Smith MM, Baewick FH, Ahlstrom B, Stover EJ. Worsening of symptoms is associated with lower physical activity levels in individual with multiple sclerosis. *Mult Scler*. 2008;14(1):140-142.
16. MacAuley E, Motl RW, Morris RS, Hu L, Doerksen SE, Elavsky S, et al. Enhancing physical activity adherence and well-being in multiple sclerosis: a randomized controlled trial. *Mult Scler*. 2007;13(5):652-659.
17. Petruzzello SJ, Landers DM, Hatfield BD, Kubitz KA, Salazar W. A meta-analysis on the anxiety reduction effects of acute and chronic exercise. Outcomes and mechanisms. *Sports Med*. 1991;11(3):143-182.

18. Altchiler L, Motta R. Effects of aerobic and nonaerobic exercise on anxiety, absenteeism, and job satisfaction. *J Clin Psychol.*1994;50(6):829-839.
19. Dood KJ, Taylor NF, Denisenko S, Prasad D. A qualitative analysis of a progressive resistance exercise program for people with multiple sclerosis. *Disabil Rehabil.* 2006; 28(18):1127-1134.
20. Petajan JH, Gappmaier E, White AT, Spencer MK, Mino L, Hicks RW. Impact of aerobic training on fitness and quality of life in multiple sclerosis. *Ann Neurol.* 1996;39(4):432-441.
21. White LJ, McCoy SC, Castellano V, Gutierrez G, Stevens JE. Resistance training improves strength and functional capacity in persons with multiple sclerosis. *Multiple Sclerosis.* 2004;10(6):668-674.
22. Macedo CS, Garavello JJ, Oku EC, Miyagusuku FH, Agnoll PD, Nocetti PM. Benefícios do exercício físico para qualidade de vida. *Revista Brasileira de Atividade Física.* 2004;(8):19-27.
23. Greve P, Alves BJ, Diniz FP, Braga PLG, Nascimento NH, Calonego CA. Exercícios resistidos em portadores de esclerose múltipla – relato de caso. *Rev Bras Fisioter.* 2006;10(2 supl).
24. White LJ, Castellano V. Exercise and brain-health-implications for multiple sclerosis: Part 1- neuronal growth factors. *Sports Med.* 2008;38(2):91-100.
25. Dalgas U, Stenager E, Ingeman-Hansen T. Multiple sclerosis and physical exercise: recommendations for the application of resistance, endurance- and combined training. *Mult Scler.* 2008;14(1):35-53.
26. Ayán PC, Martín SV, Souza TF de, Paz FJA de. Effects of a resistance training program in multiple sclerosis spanish patient: a pilot-study. *J Sport Rehabil.* 2007;16(2):143-153.
27. Taylor NF, Dodd KJ, Prasad D, Denisenko S. Progressive resistance exercise for people with multiple sclerosis. *Disabil Rehab.* 2006;28(18):1119-1126.

Received: 08/28/2007

Recebido: 28/08/2007

Approved: 06/19/2008

Aprovado: 19/06/2008