Sports on Quality of Life of Individuals With Spinal Cord Injury: A Case Series

ORIGINAL ARTICLE

Fausto Orsi Medola[1]
Rosangela Marques Busto[1]
Ângela Farah Marçal[1]
Abdalla Achour Junior[1]
Antonio Carlos Dourado[1]

1. State University of Londrina
Londrina, PR

Mailing address:
Rua Piedade, 996 – Centro
18682-045 – Lençóis Paulista, SP
E-mail: fmedola@yahoo.com.br

ABSTRACT

Introduction and objective: The spinal cord injury is a trauma of physical and social impact to the individual, which causes profound changes in the lives of those affected by the resultant paraplegia or quadriplegia. The aim of this study was to evaluate the perception of quality of life of individuals with spinal cord injury before and after a period of sport training. Methods: The study included 16 people with paraplegia by spinal cord injury, who underwent sports training of basketball in wheelchairs, with a frequency of 2 times per week for a period of 1 year. To assess the quality of life before and after the training period, we used the SF-36. Results: There was overall improvement in quality of life ($p = 0.006$) when considering the mean of all areas of the questionnaire PRE (605.7) and POST (651.9) training combined scores. Additionally, the analysis of the results showed statistically significant improvement in functional capacity ($p = 0.004$), general health ($p = 0.001$) and emotional aspects ($p = 0.02$). Conclusion: Sports can promote improvement in quality of life for people who need a wheelchair for mobility, and represent new goals and challenges in continuing the process of rehabilitation.

Keywords: paraplegia, wheelchairs, basketball.

INTRODUCTION

Spinal cord injury (SCI) is a trauma of physical and social impact to the individual, being considered one of the most severe and devastating incapacitating syndromes which can affect human beings, since it causes failure of a series of functions, among these locomotion[1]. The main cause for SCI is trauma, which leads to sequelae and deep alterations in the lives of its subjects by resulting paraplegia or tetraplegia[2]. It is estimated that in Brazil approximately 11,300 individuals become paraplegic or tetraplegic every year[3]. The debilitating consequences of SCI frequently lead to compromising of ability to perform daily tasks and limit the mobility and participation in the community functions[4]. Improvement in the medical treatment as well as care with the individuals with medullary injury in the recent decades have prolonged the life expectancy of these individuals[5]. However, SCI still generates high costs for the government and causes important alterations in the life style of the patient[6].

According to the World Health Organization (WHO), quality of life is the perception the individual has about his/her life position, in the context and culture as well as the values system he/she lives in and regarding his/her goals, expectations, patterns and concerns[7]. Compromising with quality of life and wellness in individuals with SCI are also related[8,9].

Sport and leisure begin to become part of the medical treatment due to their crucial role in the process of facing the "disadvantage" by disabled individuals. The benefits of sports practice to individuals with SCI are: improvement of oxygen maximum uptake ($\dot{V}O_2$ maximum), gain in aerobic capacity, reduction of the risk of cardiovascular diseases and of respiratory infections, decrease in the incidence of medical complications (urinary infections, eschars and renal infections), reduction of hospitalizations, increase of life expectancy, increase of the levels of community integration, assistance in the facing of the disability, favoring of independence, self-image, self-esteem and life satisfaction improvement besides decrease in the probability of psychological disorders[10].

The aim of this study was to assess the quality of life perception before and after a sports training period in individuals with spinal cord injury.

METHODS

The present study was performed as part of the activities of the project "Sports in health and quality of life of the individual with medullary injury", developed from the year of 2007 in the Center of Physical Education and Sports (CEFE) premises of the State University of Londrina (UEL), which promotes sports initiation of paraplegic and tetraplegic individuals due to SCI, wheelchair users, through training of the adapted modalities: athletics, basketball in wheelchairs, table tennis and weight lifting.

The study had the participation of paraplegic individuals by SCI, who performed basketball on wheelchair training with duration of two hours, frequency of two times per week, for a one-year period, between the months of January and December, 2009. During the activities, the participants used adapted wheelchairs appropriate for basketball practice on wheelchair, belonging to the project mentioned above, and stored at the CEFE-UEL. The training of a day was composed of physical training (mean time of 25 minutes) with the aim to improve the physical capacities, technical and tactical training (mean time of 45 minutes) based on the basketball on wheelchair fundamentals and collective at the end (mean time of 30 minutes), besides two 10-minute intervals for rest and hydration. The participants were assessed concerning quality of life in the beginning and end of the training period through the application of the questionnaire SF-36 as an interview, a generic instrument for assessment of quality of life related to health, widely used in many health conditions, multidimensional, translated, culturally adapted

and validated for the Portuguese language[11]. This questionnaire is composed of eight domains referring to many aspects of quality of life: general health status; functional capacity; body pain; physical aspects; vitality; emotional aspects; mental health and social aspects. The values of each item range from 0 to 100 points, corresponding respectively to the worst general status of quality of life. All participants were informed about the study's aims and signed the Free and Clarified Consent Form approved by the Ethics Committee of the Institution through the legal decision # 159/07.

In order to assess the results, descriptive analysis composed of mean and standard deviation and Student's t test were used for comparison of the PRE and POST training. The SPSS for Windows® package, version 13.0 was used for statistical analysis.

RESULTS

The sample was composed of 16 male paraplegic individuals with SCI, mean age of 30.4 ± 6 years, and injury level between T1 and L2. Automobilistic accidents (50%) were the main cause for SCI among the participants, which presented mean time of injury of 4.6 ± 4.2 years. The participants presented general improvement in quality of life (p = 0.006) after the training period, when the means of all domains summed up were considered (figure 1).

When the results of each domain are considered independently, improvement with statistical significance in functional capacity (p = 0.004); general health status (p = 0.001) and emotional aspects (p = 0.02) (figure 2) was observed. The results also showed improvement with no statistical significance in the physical aspects; vitality and social aspects domains and negative results concerning pain and mental health again with no statistical significance.

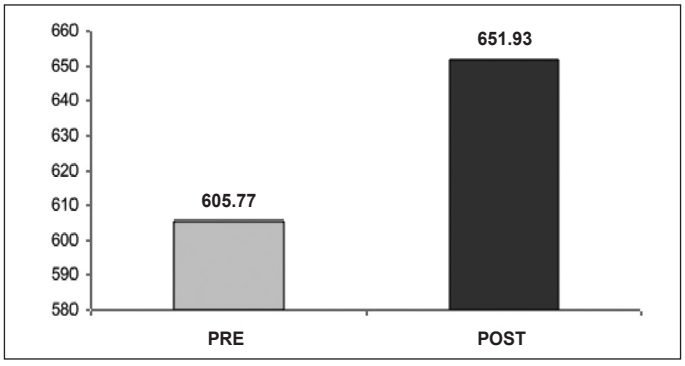

Figure 1. Mean of all participants concerning the total score of the SF-36 questionnaire. PRE: evaluation prior to the training (SD: 112.64); POST: evaluation after the training (SD: 103.63).

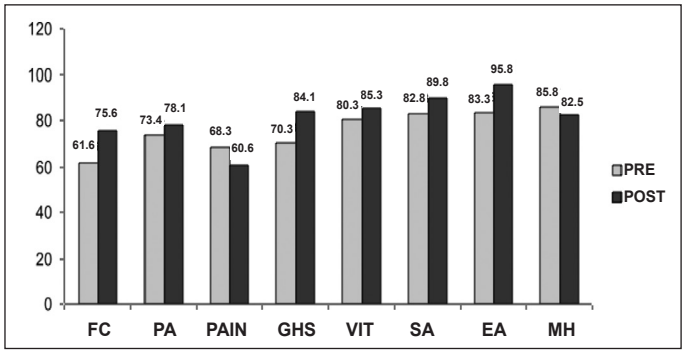

Figure 2. Mean of the scores of the participants in the domains of the SF-26 PRE and POST training. FC: functional capacity; PA: physical aspects; GHS: general health status; VIT: vitality; SA: social aspects; EA: emotional aspects; MH: mental health.

DISCUSSION

The negative impact in quality of life of individuals who suffered SCI has been reported in the literature. Vall et al.[6] carried out a study assessing the quality of life of individuals with SCI and verified that the patients present great compromising of their quality of life in all domains, especially concerning the social aspects. Thus, it becomes evident that complementary initiative which promotes rehabilitation with the aim to offer better quality of life to these individuals and which provide new possibilities and opportunities are necessary, and sports represent an interesting alternative in this context.

Several investigations[12-14] have shown that physical activity promotes physical, psychological and social benefits to the individuals with disabilities. Sports play a crucial role in rehabilitation: they complement and broaden the alternatives; stimulate and develop the physical, psychological and social aspects; and favor independence[10].

In our study we could observe improvement in quality of life in six out of eight domains used in the questionnaire as well as general improvement of the mean in all participants before and after the sports training period. Aspects such as functional capacity, perception of the general health status and the emotional ones presented significant improvement among the participants, which could be interpreted as a direct result of the physical and sports training, since they provide improvement of physical condition, social interaction as well as onset of new goals for life. In a similar study[15], the effect of the sports training was assessed in the physical, psychological and social aspects, and improvement in the two last aspects was found, with the participants presenting high vigor, low depression and improvement in social relationships, which corroborates our findings; however, there was no improvement in the physical aspects.

Noce et al.[16] evaluated the perception of quality of life in individuals with physical disability of many causes, divided in two groups: sedentary and basketball in wheelchair athletes, and observed that the active group presented higher scores in all domains (physical, psychological, social and environmental). Nevertheless, although the results of this study support conclusions similar to our study, it is important to consider that they represent the difference in quality of life amongst practitioners and non-practitioners of physical activity who belong to heterogeneous groups of physically disabled individuals. Therefore, in our study we could verify the impact of one year of sports training in the quality of life of a group of physically disabled individuals with the same etiology (SCI), paraplegic, who were previously sedentary.

It is worth mentioning that the basketball in wheelchair team participated in two state competitions and strong engagement with training was observed in the group with the goal to gain expressive results. We believe that the negative results found in the pain and mental health aspects may be interpreted as precise findings and may represent alterations at the moment of the final evaluation. More specifically, the pain aspect raises the possibility that the used training, for being collective, have generated excessive training load for some individuals, which would justify these results. Thus, the present study suggests benefits of the sports practice in the quality of life of individuals with medullary injury. However, the

presence of a control group could offer more complete explanations concerning the physical and sports training effect in this population and hence ground more concrete conclusions.

As a conclusion, it can be observed that the sports training provided significant improvement of quality of life in individuals with spinal cord injury. The adapted sports activity complements the rehabilitation process of individuals who suffered spinal cord injury and need a wheelchair for mobility, and represents new goals and challenges in life. Nevertheless, further studies with stricter methodology are needed in order to promote better understanding on the sports training effects in individuals with spinal cord injury as well as to understand how the many training variables influence on their final result so that it can develop with better chances of success.

All authors have declared there is not any potential conflict of interests concerning this article.

REFERENCES

1. Greve JMDA, Casallis MEP, Barros TEPF. Avaliação clínica e funcional da lesão medular: indices motores e sensitivos e funcionais utilizados. Diagnóstico e tratamento da Lesão da Medula Espinhal. São Paulo: Roca, 2001.
2. Mutti CG. Avaliação das diferenças funcionais entre pacientes paraplégicos por trauma raquimedular que freqüentaram e que não freqüentaram um centro de reabilitação [Dissertação]. São Paulo: Universidade de São Paulo; 2008.
3. Mansini M. Estimativa da incidência e prevalência de lesão medular no Brasil. J Bras Neurcirurg 2001;12:97-100.
4. Chan SC, Chan AP. User satisfaction, community participation and quality of life among Chinese wheelchair users with spinal cord injury: a preliminary study. Occup Ther Int 2007;14:123-43.
5. Budh CN, Österaker AL. Life Satisfaction in individuals with spinal cord injury and pain. Clin Rehab 2007;21:89-96.
6. Vall J, Braga VAB, Almeida PC. Study of the quality of life in people with traumatic spinal cord injury. Arq Neuropsiquiatr 2006;64:451-5.
7. Dantas RAS, Sawada NO, Malerbo MB. Pesquisas sobre qualidade de vida: revisão da produção científica das universidades públicas do estado de São Paulo. Rev Lat Am Enfermagem 2003;11:532-8.
8. Charlifue SW, Weitzenkamp DA, Whiteneck GG. Longitudinal outcomes in spinal cord injury: aging, secondary, conditions, and well-being. Arch Phys Med Rehabil 1999;80:1429-34.
9. Leduc B, Lepage Y. Health-related quality of life after spinal cord injury. Disabil Rehabil 2002;24:196-202.
10. Silva MCR, Oliveira RJ, Conceição MIG. Efeitos da natação sobre a independência funcional de pacientes com lesão medular. Rev Bras Med Esporte 2005;11:4:251-4.
11. Ciconelli RM, Ferraz MB, Santos W, Meinão I, Quaresma, MR. Tradução para a língua portuguesa e validação do questionário genérico de avaliação de qualidade de vida SF-36 (Brasil SF-36). Rev Bras Reumatol 1999;3:143-50.
12. Zuchetto A, Castro R. As contribuições das atividades físicas para a qualidade de vida dos deficientes físicos. Kinesis 2002;26:52-68.
13. Souza P. O Esporte na Paraplegia e Tetraplegia. Rio de Janeiro: Guanabara Koogan, 1994.
14. Mello MT, Natal CL, Cunha JM, Tufik S. Epidemiologia do padrão de sono em adultos desportistas portadores de lesão medular. Rev Port Med Desp 1995;13:89-100.
15. Labronici RHDD, Cunha MCB, Oliveira ASB, Gabbai AA. Esporte como fator de integração do deficiente físico na sociedade. Arq Neuropsiquiatr 2000;58:1092-9.
16. Noce F, Simim MAM, Mello MT. A percepção de qualidade de vida de pessoas portadoras de deficiência física pode ser influenciada pela prática de atividade física? Rev Bras Med Esporte 2009;15:174-8.