

Evaluation of physical exercise habits in Brazilian patients with epilepsy

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Abstract

In this study we present data from a survey that aimed to assess the physical activity of a sample of adult outpatients with epilepsy. One hundred adult outpatients of both sexes with epilepsy answered a survey addressing exercise habits. Fifty-eight males and forty-two females participated in this study. The mean age of onset of seizures was 18.6 years and the mean duration of epilepsy was 16.1 years. Sixty patients had controlled or rare seizures, 8 infrequent seizures, 17 frequent seizures, and 11 very frequent seizures. Eighty-six had partial epilepsy and only 3 had abnormal neurological examinations. Of the total, 51 engaged in physical activity, 85 did not believe that sports precipitate seizures, and 15 were forbidden by their physicians to engage in physical activities. Moreover, 14 were cautioned against participation in sports by their relatives and friends. Eight-four patients had never experienced seizures during physical exercise, 36 believed that physical activity has a positive influence on treatment, and only 1 related injuries associated with seizures. Forty-five are afraid of having seizures during exercise because the seizures might attract the attention of others and they would make fools of themselves. Our data show that although most of our patients do not regularly engage in physical activity, they believe that it might improve medical treatment.

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1. Introduction

Many persons with epilepsy do not participate in physical exercise programs and live a sedentary life [1–3]. Overprotection, isolation, low self-esteem, depression, and anxiety [4–6] are considerable barriers to an active life. Furthermore, obstacles for some persons with epilepsy who wish to live an active life are the notion that physical activity provokes seizures and also make them prone to injuries [1].

Several studies have shown a low degree of participation in physical activities among persons with epilepsy [2,3]. Although the main concern with regard to physical exercise by persons with epilepsy has been exercise-in-

duced seizures, other factors such as lack of training facilities, problems with transportation, low motivation, and fear of qualified instructors who know how to handle such problems are noted [2]. Various studies have been designed to study this subject comparing physical and social activities among patients with epilepsy based on questionnaires and/or clinical studies [1,7]. They also assess physical fitness by using standardized tests of physical endurance [7,8] and physical training programs [9].

Epidemiological data in the literature have shown the relationship between epilepsy and physical exercise based on different populations from various countries. Bjorholt et al. [2] observed that patients with epilepsy from a Norwegian population were half as active physically as the normal population and their physical fitness corresponded to their sedentary lifestyle. Other studies have confirmed these findings showing that

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people with epilepsy have a low degree of participation in physical activities [1,10]. Despite the fact that several epidemiological studies have been performed on this subject, these patient samples may not be directly applicable to other countries. Therefore, we sought to study the degree of participation in physical activities among Brazilian (São Paulo) patients with epilepsy using a questionnaire.

2. Material and methods

Adult outpatients with epilepsy of the Federal University of São Paulo Neuroclinical Center of Epilepsy were invited to participate as study subjects during a routine visit to the outpatient clinic. A questionnaire was designed to assess physical and leisure time activities. Patients who could not read or comprehend the meaning of the questionnaire were excluded. Patients answered the 41-item questionnaire with simple closed-ended-type response scales. Questions concerned: (a) the facilities for the participation in various local community leisure time activities; (b) attitudes toward physical exercise in particular, and their degree of participation; and (c) aspects related to epilepsy. The questionnaire was answered by 100 patients (58 males and 42 females; mean age, 31 years; range 18–56 years). To compare our data, we used as control group a research study that analyzed the physical activity level of São Paulo State population [11].

The mean age of onset of seizures was 18.6 years and the mean duration of epilepsy was 16.1 years. Subjects were classified on the basis of seizure type, according to Pazzaglia et al. [12], into two groups: partial (86%) and generalized (14%). Sixty patients had controlled or rare seizures, 8 infrequent seizures, 17 frequent seizures, and 11 very frequent seizures. Only 3 patients presented abnormal neurological examination.

All patients were treated with at least one type of antiepileptic drug (AED) at the time of participation. Carbamazepine (51%) was the most common AED followed by phenobarbital (19%). Patients reported exercise habits, such as frequency, duration, distance, and subjective intensity of physical exercise or sports activities; how often seizures occurred during exercise; during which activities seizures occurred; how long does or did the patient participate in physical activities; and the most frequent sports. Patients also answered questions about reasons for inactivity, such as fears about exercise and barriers to exercise.

3. Results

All patients reported leisure time opportunities and most of them described leisure time for enjoying cinema,

social contact with friends, walking, and night life. Eighty-eight patients were not involved in any social groups or clubs and only 12 patients participated in sports clubs and 10 in religious groups. Only 34 patients were employed and 7 of them did not answer. Most of the patients with epilepsy (66%) did not have a driver's license. Table 1 lists the leisure time activities among the patients with epilepsy.

Fifty-one participated in physical activities but not all of them regularly. Patients were classified as being active or inactive and the guidelines of the American College of Sports Medicine [13] were used: active subjects were those who exercised a minimum of 20 minutes at least three times a week at an adequate intensity. Fifteen percent of the patients were qualified as active under this condition. All patients classified as active were under supervision or orientation of an instructor during exercise. The remaining 85% were classified as inactive. Almost all of the patients who did exercise regularly (13 of 15 patients) had been engaging in physical activity for at least 1 year. Furthermore, among all subjects active or inactive who were involved in physical activities, 11 had frequent seizures (partial seizures, 9; generalized seizures, 2) and 7 of them participated in sports activities.

Patients also responded as to whether seizures ever occurred during sports or physical activities. Eight-four percent of the patients in our study had never experienced seizures during physical exercise and 36% of them believed that physical activity has a positive influence on treatment effectiveness based not only on their personal experience during the periods when they exercised but also on information reported by friends, acquaintances, and persons with epilepsy. Interestingly, only one patient related injuries associated with seizures. Among the active patients in our study ($n = 15$), 5 presented with frequent or very frequent seizures and only 2 of them reported seizures during exercise. Notably, the majority of the patients (85%) do not believe that sports precipitate seizures. Moreover, 15% were forbidden by their physicians to engage in physical activities and 14% were cautioned against participation in sports by their relatives and friends. Forty-five patients were afraid of having seizures during exercise because the seizures might attract the attention of others and they were

Table 1
Leisure time activities ($n = 100$)

Activity	Participation
Cultural activities (cinema, theatre, etc.)	23
Social contact with friends	67
Sports activities	51
Walking	46
Night life (dancing, bars, etc.)	19
Shopping	47
Driving	19
No answer	0

afraid of making fools of themselves. Table 2 lists the barriers to and fears of exercise participation in persons with epilepsy.

With respect to questions on sport habits, different sports were quoted more than once. The five most frequent sports were soccer ($n = 25$), swimming ($n = 18$), gymnastics ($n = 18$), volleyball ($n = 17$), and bicycling ($n = 5$). The questionnaire included a number of possible reasons for stopping sports activities. The two main explanations were a lack of time ($n = 19$) and health problems ($n = 8$). Questions about enjoying physical exercise were answered by all patients, independent of their involvement or their degree of participation. Eighty-two enjoyed participating in physical activities and 18 did not. Thirty-six usually participated in physical activities alone.

4. Discussion

The objective of this study was to assess the degree of participation in physical activity as well as leisure time among Brazilian patients with epilepsy with a questionnaire. The random sample of São Paulo inhabitants seems to be representative of the average Brazilian population. The excellent facilities for various leisure time activities and possibilities of being engaged in several sports activities in the place chosen provided gave similar opportunities to all subjects.

Although only 15% percent of patients were qualified as active, that is, exercised regularly, more than half of the patients participated in physical activities once or twice per week or on the weekends. Similar results were obtained by Bjorholt et al. [2], who reported that only 10

of 44 patients participated regularly in sports activities. Roth et al. [1] noted in their study that active subjects tended to have fewer seizures than inactive subjects. Our results are in agreement with previous studies [1,2] showing that the subjects rarely reported seizures during exercise. In our study, we considered as a control group the results of Matsudo et al. [11], who studied 2001 subjects of the São Paulo State population (14 to 77 years old; 953 males, 1048 females) and showed that 53.6% were considered active.

In general, seizures during physical exercise seem to be rare [15]. Only a few studies have reported exercise-induced seizures [9,15–17]. Seizure during exercise occurred in 6 of 21 patients in the study by Bjorholt et al. [2] and in 4 of 15 patients in another study [18]. Nakken [10] suggested in his study the use of the term *exercise-induced seizures* only for patients who experienced seizures in >50% of training sessions. In our study, 16% of the patients presented with seizures during exercise. We cannot correlate this variable because we did not investigate the number of seizures during exercise but only whether they experienced seizures, while engaging in exercise. In addition, among the 11 patients who had frequent seizures and were involved in physical activities, 9 presented with partial seizures. Complex partial seizures with or without secondary generalization have been reported to be the seizure type most susceptible to activation during exercise [10,14]. Among the active patients in our study ($n = 15$), 5 presented with frequent seizures and only 2 of them reported seizures during exercise. Interestingly, all the subjects in our study do not believe that exercise is a seizure-inducing component.

Although the beneficial effect of physical exercise on seizure frequency is still a matter of controversy [19], several clinical [3,9,18] and experimental [20,21] studies have shown a remarkable decrease in seizures after a physical training program or regular sports.

The most common explanations for not being involved in sports activities were lack of time and health problems. Of course other factors, including fear of seizures and of attracting attention, discouraged them from engaging in sports activities. Limitations on social life such as lack of a driver's license and overprotection based on inadequate fears of relatives [2] may be additional factors that contribute to the lack of physical activity. In our study, advice not to participate in sports activities was given by family members and doctors in six cases.

Another interesting aspect in this study is the type of sport or physical activity chosen by patients with epilepsy. They usually prefer activities in which they do not have to join a team or a group of people [2]. Swimming was the most popular physical activity among the persons with epilepsy in the Steinhoff study [7]. On the other hand, Nakken [10] observed swimming less often and a preference to exercise with friends due to safety

Table 2
Barriers and fears to exercise participation

<i>General</i>	
Do not like to exercise	18%
Do not have time to exercise	25%
Afraid of looking stupid or unattractive	15%
No one to exercise with	37%
Unsure how to begin and proceed with an exercise program	59%
Tiredness after exercising	38%
Afraid that exercise may lead to health problems	12%
<i>Epilepsy-specific</i>	
Fear that exercise will cause seizures	15%
Previously experienced a seizure while exercising	16%
Fear of being embarrassed by a seizure while exercising	45%
Advised to avoid most types of exercise by a physician	15%
Discouraged from exercising by family and/or friends	14%
Know of other persons with epilepsy who have had seizures while exercising	16%

considerations. In our opinion, although the tendency for patients with epilepsy was to choose individual sports or physical activities that do not involve a great number of people, soccer was the most popular sport among the patients, probably because of the Brazilian tradition in this sport.

Campaigns promoting greater physical activity have been launched in the Brazilian mass media, which have reached control subjects and patients with epilepsy. Specific campaigns to inform and stimulate patients to become more active are necessary. Unfortunately, because of a lack of understanding of epilepsy, many people have been unnecessarily cautioned against participation in some activities. However, with informed, qualified supervision and the necessary safety precautions, there is little that the person with epilepsy should avoid. We believe that physicians alone may not be effective enough in dealing with these matters, but it may be reasonable for them to have the support of health authorities, social workers, and sports instructors to achieve these goals. In conclusion, our work confirms data from previous studies suggesting that although those with epilepsy believe that physical exercise has a positive influence on treatment, most are still afraid of having seizures during exercise and attracting the attention of others.

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References

- [1] Roth DL, Goode KT, Williams VL, Faught E. Physical exercise, stressful life experience, and depression in adults with epilepsy. *Epilepsia* 1994;35:1248–55.
- [2] Bjorholt PG, Nakken KO, Rohme K, Hansen H. Leisure time habits and physical fitness in adults with epilepsy. *Epilepsia* 1990;31:83–7.
- [3] Denio LS, Drake ME, Pakalnis A. The effect of exercise on seizure frequency. *J Med* 1989;20:171–6.
- [4] Freeman JM. Epilepsy and swimming. *Pediatrics* 1985;76:139.
- [5] Kogeorgos J, Fonagy P, Scott DF. Psychiatric symptom patterns of chronic epileptics attending a neurological clinic: a controlled investigation. *Br J Psychiatr* 1982;140:236–43.
- [6] Gates JR, Spiegel RH. Epilepsy, sports and exercise. *Sports Med* 1993;15:1–5.
- [7] Steinhoff BJ, Neuss K, Thegeder H, Reimers CD. Leisure time activity and physical fitness in patients with epilepsy. *Epilepsia* 1996;37:1221–7.
- [8] Jalava M, Sillanpaa M. Physical activity, health-related fitness, and health experience in adults with childhood-onset epilepsy: a controlled study. *Epilepsia* 1997;38:424–9.
- [9] Nakken KO, Bjorholt PG, Johannessen SI, Loyning T, Lind E. Effect of physical training on aerobic capacity, seizure occurrence, and serum level of antiepileptic drugs in adults with epilepsy. *Epilepsia* 1990;31:88–94.
- [10] Nakken KO. Physical exercise in outpatients with epilepsy. *Epilepsia* 1999;40:643–51.
- [11] Matsudo SM, Victor Rodrigues Matsudo VR, Araújo T, Andrade D, et al. Nível de atividade física da população do Estado de São Paulo: análise de acordo com o gênero, idade, nível sócio-econômico, distribuição geográfica e de conhecimento. *Rev Bras Ciencia Mov* 2002;10:41–50.
- [12] Pazzaglia P, D'Alessandro R, Lozito A, Lugaresi E. Classification of partial epilepsies according to the symptomatology of seizures: practical value and prognostic implications. *Epilepsia* 1982;23:343–50.
- [13] American College of Sports Medicine Position Stand: the recommended quantity and quality of exercise for developing and maintaining cardiorespiratory and muscular fitness in healthy adults. *Med Sci Sports Exerc* 1990;22:265–74.
- [14] Bennett DR. Sports and epilepsy: to play or not to play. *Semin Neurol* 1981;1:345–57.
- [15] Korczyn AD. Participation of epileptic patients in sports. *J Sports Med Phys Fitness* 1979;19:195–8.
- [16] Ogunyemi AO, Gomez MR, Klass DW. Seizures induced by exercise. *Neurology* 1988;38:633–4.
- [17] Schmitt B, Thun-Hohenstein L, Vontobel H, Boltshauser E. Seizures induced by physical exercise: report of two cases. *Neuropediatrics* 1994;25:51–3.
- [18] Eriksen HR, Ellertsen B, Gronningaeter H, Nakken KO, Loyning Y, Ursin H. Physical exercise in women with intractable epilepsy. *Epilepsia* 1994;35:1256–64.
- [19] Bennett DR. Sports and epilepsy: to play or not to play. *Semin Neurol* 1981;1:345–57.
- [20] Arida RM, Vieira AJ, Cavalheiro EA. Effect of physical exercise on kindling development. *Epilepsy Res* 1998;30:127–32.
- [21] Arida RM, Scorza FA, Santos NF, Peres CA, Cavalheiro EA. Effect of physical exercise on seizure occurrence in a model of temporal lobe epilepsy in rats. *Epilepsy Res* 1999;37:45–52.