

## Sports and safety in epilepsy

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### Abstract

Sport is important not only in normal healthy populations, but also in persons with medical illness, physical or mental disabilities. Active participation in sports is beneficial physically and psychologically. The main concern in sports for persons with epilepsy is safety. This results in sedentary lifestyles, over-protective attitudes of caregivers and friends. Despite the benefits of sports, with the various reassuring studies showing non-significant impact of sports in seizures frequency, physiological changes, EEG, and physical injury, people with epilepsy continue to be less active in sports. This is related to various barriers in sports include epilepsy-specific fear, personal barriers, social barrier. Understanding and overcoming these barriers is the key in promoting sports among people with epilepsy.

### INTRODUCTION

Sports continue to play an important part in the daily lives of many people in 21<sup>st</sup> century, not only in healthy populations, but also in persons with medical illness, physical or mental disabilities. Active participation in sports is beneficial physically and psychologically.<sup>1</sup> Sports is one of the ways for self accomplishment, as demonstrated by the organisation of Special Olympics, which was first held in Chicago in 1968 and latest in Shanghai in 2007. However, many epilepsy patients do not participate in sports, and caregivers often discourage epilepsy patients from participating in sports. This paper briefly reviews the safety concerns in sports for people with epilepsy – risk of sport induced seizure and physical injury; attitudes of people with epilepsy, caregivers and friends towards sports; and the need to encourage sports in epilepsy care.

### SAFETY IN SPORTS

The first concern of safety is sports induced seizures. The study by Steinhoff *et al.* found that among patients with epilepsy, 41% reported a fear of seizure during sports, and 40% were concerned about seizure-related injuries.<sup>2</sup> There has been postulations that extreme fatigue, lack of sleep, dehydration, electrolyte loss, hyperthermia, hypoglycaemia during sports may provoke seizures.<sup>1</sup>

On the other hand, as early as 1941, Lennox claimed that: “Physical and mental activity seems to be the antagonist of seizures. Enemy Epilepsy prefers to attack when the patient is off-guard, sleeping, resting, or idling.” Clinical study by

Nakken showed that sport provoked seizures is uncommon. Exercise either leads to fewer seizures or does not change seizure control. In the case-control study, only 2% found to have genuine exercise induced seizure, defined as having seizures in >50% of the training sessions.<sup>3</sup> Electroencephalography (EEG) studies showed that EEG discharges reduced during sports. During exercise, there are reduced voltage production, desynchronisation of the spontaneous resting background, and disappearance of epileptiform discharges.<sup>4-6</sup> The mechanism of seizure reduction during sports is unknown, but postulations include hypercapnia, increased GABA activity and endorphins production during exercise, stress reduction with regular exercise and concentration during sports.

Exercise induced seizure, though rare, do occur in certain individual. Among those prone to have exercise-related seizures, there was a predominance of patients with symptomatic localization-related epilepsy and a tendency to occur during strenuous activity.<sup>3</sup> Epileptiform discharges were found to increase in recovery phase of exercise in a few reports.<sup>7-8</sup>

The second concern of safety is physical injury during sports. In our own survey of sports related seizures, of the 24 patients who exercised regularly, 3 (12.5%) had seizures related injury during sports, but the injuries were mild. (Unpublished observation) There is no evidence that repetitive contacts in body contact sport increases seizures frequency, or increased risk of seizures following sport related head injuries.<sup>9</sup> However, the risk of drowning or serious injury in water sports is four times that of the general

population, though the absolute risk remains small, mostly occurring when unsupervised and without precaution.<sup>10</sup>

### **BARRIERS IN SPORTS**

Thus, the fear of involvement in sports among people with epilepsy appears to be unfounded. Studies showed that people with epilepsy continue to be less active in sports participation.<sup>3</sup> Steinhoff *et al.* found that only 25% of people with epilepsy exercised regularly, 44% occasionally and 31% never as compared with 42%, 43% and 15% respectively in patients without epilepsy.<sup>2</sup>

Roth *et al.* reported that general and epilepsy-specific fears are the main barriers in sports.<sup>11</sup> Epilepsy-specific barriers and fears include previous experience of seizure during sports (17% in epilepsy patients who were inactive in sports vs. 3% in those active in sports), fear of seizure aggravation (23 vs. 8%), and fear of embarrassment (38 vs. 18%).

Besides fear, there are other personal barriers in sports, i.e. no time to exercise, no one to exercise with, soreness and tiredness after exercising, trouble with health problems such as muscle strains or cardiovascular symptoms, unsure how to begin and proceed with an exercise program, don't like to exercise, lack of transportation, lack of access to exercise facilities etc.<sup>11</sup>

Social barriers are under estimated for sports in epilepsy. In the survey conducted by the author on Malaysian general public in Kuala Lumpur, only 67% of the respondents were willing to exercise together with someone with epilepsy and only 42% knew what to do when encountering somebody having a seizure. (Unpublished observation) Parents and even physicians may tend to be overprotective and the restriction in activity may be disproportionate to the risk of seizures.<sup>12</sup> As reported by Roth, in people with epilepsy inactive in sports, as high as 15% of their physicians and caregivers advised against sports.<sup>11</sup> In many Asian countries where stigma associated with epilepsy is prevalent, fear of embarrassment from seizures in the public places may also contribute to restriction in sports, especially for outdoor sports.

In the survey by the author on Malaysians with epilepsy, "no time to exercise" and "no one to exercise with", were the commonly expressed reasons for not engaging in sports activity. (Unpublished observation) Instead, most people spend long hours watching television and surfing internet. Some respondents regarded shopping and housework as adequate physical

exercises, thus no need for sports. These pastimes are often solitary pursuits without the risk of embarrassment from seizures in the public place. Ironically television, internet, and shopping in malls have become modern alternatives and "barriers" to sports.

### **PROMOTING SPORTS IN EPILEPSY**

Since sports are beneficial for physical health, social interactions, nurturing of self-confidence and self-esteem, it is injudicious to over emphasize the risk in sports, thus placing undue restrictions on sports in people with epilepsy. As recommended by American Academy of Pediatrics Committee (1983), "Epilepsy *per se* should not exclude a child from hockey, baseball, football, basketball and wrestling".<sup>13</sup> Decision on sports participation should be based on individual basis, depends on the types and control of the seizures, presence of aura, the nature of the sports activities and whether there is supervision. Appropriate safety precautions and avoidance of triggers can minimize the risk of injury. Based on present evidences, sports should generally be actively encouraged in people with epilepsy.

Stepwise approach can be an effective strategy in overcoming barriers in sports. Home based and low risk sports can be encouraged as initial activities. These are for example slow breathing exercise such as Yoga and Qigong, which is commonly practiced in parts of Asia. In the author's survey on the Malaysian (epilepsy?) population, 21% of the respondents practice qigong. In addition, 68% of the Malaysian respondents believed that yoga or qigong improved seizures. It is thus also culturally advantageous in these communities. Study by Nakken showed that the patients in Norway exercised more often in fitness centers and together with friends, as compared to activities practices in the public places, e.g. walking, hiking, skiing and swimming.<sup>3</sup> Instead of exercises in fitness centers, ping-pong is a moderate form of exercise, which is an inexpensive sport that can be practiced at home among family members or close friends. It can be the culturally appropriate initial or next level of activity. Outdoor and group sports can be encouraged once people with epilepsy have overcome their fear in sports. Advise to supervisors or partners how to response in case of seizures will enhance the confidence of the group as well as the patients themselves.

In conclusion, promoting sports among people with epilepsy in Asia is a long journey. There is

personal barrier, as well barriers from caregivers, family and society. It is important for the health care professionals to be aware of the many benefits of sports, and be sensitive to their local culture as they promote sports among their patients.

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