

## 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

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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