Burns from foul play? No – previously unsuspected epilepsy

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SUMMARY

Introduction. Injuries such as burns may occur from unwitnessed and unsuspected new onset epilepsy with forensic implications.

Case report. A young woman was found with >25% 2nd and 3rd degree body burns after an unwitnessed morning event in a shower.

Discussion. The onset of tonic-clonic seizures and limb jerks in adolescence with a typical EEG recording of 3–4/second spike/polyspike-and-waves are diagnostic of Juvenile Myoclonic Epilepsy (JME). Worldwide there is a significant morbidity and mortality in epilepsy from burns. The treatment of JME and of burns was discussed.

Key words: JME • tonic-clonic seizure • burns

INTRODUCTION

Unsuspected epilepsy can occasionally present with injury following a seizure. On such occasions, the seizure itself may not have been witnessed. This may lead to "mysterious" injury or death from unheralded and unsuspected epilepsy onset. The forensic aspect is resolved when an EEG shows classic patterns of genetic epilepsy or when further seizures supervene.

CASE REPORT

A 17-year-old woman was found scalded with 26% total body surface second and third degree burns on the dependent parts of the back, neck and scalp. She had been lying in a shower with the hot water on, and her fall had not been heard. She had been up late the night before, and relatives suspected foul play for unclear reasons. Her mother remembers staring spells as a child, occasional limb jerks in the morning and some febrile seizures, but no diagnosis was made.

In the Burns-ICU she received skin-grafts, acute management of electrolytes and infection, and remained sedated and unable to provide a history. Eighteen days into her stay there was a witnessed tonic-clonic seizure. Neurological examination was without focality in a mildly sedated patient. Head CT was normal and EEG revealed the typical generalized runs of spike-wave discharges at 3 to 4 Hz, lasting up to 10 seconds. She was treated with valproate, then lamotrigine and finally with levetiracetam with sporadic seizures over the next three years.

DISCUSSION

The clinical history of staring spells, occasional limb jerks and a tonic-clonic seizure with generalized spike waves are diagnostic of Juvenile Myoclonic Epilepsy (Kaplan et al., 2002). This common childhood epilepsy may not be diagnosed for many years after the appearance of morning jerks and childhood staring spells, until a convolution brings appropriate attention and investigation. Absence seizures usually appear in early childhood, while jerks occurring several years later are
often overlooked. Tonic-clonic seizures may be the last seizure type to appear. In adolescence, sleep deprivation may precede the heralding convulsion. EEG is usually positive and diagnostic. Although valproate is probably the most effective anti-seizure medication, it is not desirable in young women because of potential weight gain, hair loss and teratogenicity, and lamotrigine is often selected because of relative safety in pregnancy and absence of cosmetic adverse effects. Occasionally myoclonic jerks may be worsened. Levetiracetam is easily instituted, but with fewer data on teratogenicity, and can produce behavioral problems. The lack of a prior epilepsy diagnosis and sudden injury in a healthy adolescent triggered concerns for foul play.

The major cause of morbidity and mortality in epilepsy is from injury sustained during a seizure. Worldwide, burns account for a significant number of these injuries. The largest category of burns occurs from scalding hot fluids, but may arise from kettles and heating appliances; and from cigarettes or hot water bottles (Hampton et al., 1988). In a domestic setting, 62/111 injuries were from scalds, with 72 in all requiring surgery (Josty et al., 2000); reburn rate was 12%. Hampton and colleagues note that patients with epilepsy are usually warned of the risks and dangers of driving, of working at heights, with machinery, or swimming alone, but are not warned of the possibility of burns, and only 5% recalled having been warned of this risk (Spitz, 1998). A survey from a burns unit showed that seizures were the cause of burns in 38% of patients (Spitz, 1998); 5–10% needed admission and 4% had surgery (Hampton et al., 1988; Spitz, 1998).

More recently, fewer patients with epilepsy are appearing in burn units along with a reduction in burn size from 15 to 2% of the body surface (Hampton and Richards, 1968). The decreasing risk of burns is attributed to a domestic change from open flames to central heating. In burns units, as a group, epilepsy patients are older and have a greater length of stay, than groups sustaining burns units because of alcoholism, drugs, learning disability or smoking (without epilepsy) (Othman, 2011).

In developing nations, most burns arose from open fires. Reports on burns have ranged from those in patients wearing grass skirts (Barss and Wallace, 1983) to stoves, cigarettes and scalds. In South Africa, about 50% of 247 burned adults had epilepsy being burned during a seizure (Allorto et al., 2001); 40% had previously had burns. A typical history was of a seizure leading to a fall onto open flames or knocking over a heating or cooking apparatus causing fire in the dwelling.

Figure 1. In this 17-year-old, the middle of this 10-second EEG segment shows a burst of high-voltage, generalized spike wave discharges appearing during wakefulness. These brief bursts may be asymptomatic but when longer may cause inattention and staring. Some bursts are associated with myoclonus or tonic-clonic seizures.
Some of these risks are avoidable since insulated kettles and hot-water bottles are available. A companion in the kitchen or switching roles may help avoid cooking burns, and to avoid burns from house-heating radiators, guards or covers can be installed. Clearly, in our patient, the diagnosis of epilepsy leading to burns, was unrecognized, and had triggered unnecessary concern for foul play.

**DISCLOSURE**
The authors have reported no conflicts of interest.

**REFERENCES**


Othman D.: Burns patients with epilepsy or a learning disability have a greater length of stay in hospital than those patients with a history of drug or alcohol abuse. Burns, 2011, 37: 541–542.