Sleepiness and Lack of Sleep

There are a number of topics about sleep that are of particular concern to people with epilepsy. Several studies have confirmed that sleepiness and sleep disorders are common in persons with epilepsy.

Patients with partial epilepsy have twice the incidence of drowsiness as people who do not have epilepsy, and this significantly worsens quality of life. Much of this may be related to sleep apnea that is frequently undiagnosed. Children with epilepsy have higher scores for poor quality sleep, anxiety about sleep, and disordered breathing. Children with epilepsy show more sleep problems than did controls -- associated with seizure frequency, age, paroxysmal activity on EEG, duration of illness, and behavioral problems.

Patients taking anticonvulsants known to disrupt sleep (phenobarbital, phenytoin, carbamazepine, or valproic acid) have increased drowsiness compared to epilepsy patients who are not taking anticonvulsants. Other possible reasons for disrupted sleep fall into several categories, including the effects of seizures, insufficient sleep, inadequate sleep hygiene, and coincident sleep disorders. (See Sleep and AEDs)

Insufficient sleep syndrome

One of the more common reasons for inadequate sleep is perhaps the most obvious- failing to spend enough time asleep! This is common in the general population, and is largely a cultural phenomenon. The demands of modern society, including work, family, and leisure time often cause people to limit their sleep time. Although most believe this to be benign, chronic sleep deprivation can clearly result in problems with memory and concentration. Persons with epilepsy are certainly not immune from this, although the magnitude of this problem is unknown.

Sleep Disruption and Epilepsy

First, sleep disruption from any cause can be a reason for an increase in seizure frequency or severity. Second, sleep disruption can also have a negative effect on short-term memory, concentration, and mood. Seizures during the night can disrupt sleep, possibly resulting in further problems with memory and concentration the following day. Finally, various anticonvulsant drugs can affect sleep in both positive and negative ways.

The amount of rhythmic electrical activity normally occurring in the brain differs considerably between states of sleep and wakefulness. It is therefore not surprising that seizures (defined as sudden, abnormally rhythmic brain activity) can be affected by normal sleep states. Studies have shown that, overall, about 20% of seizures occur during sleep. Most sleep seizures begin during stage 2, with few beginning during slow wave sleep. These are times during which the electrical activity of the brain is more synchronized (rhythmic), which is why scientists believe that seizures are more likely to begin during these states. By contrast, few or no seizures begin during REM sleep, though it is not known why the state of REM sleep (occupying roughly one quarter of sleep time) appears to be protective against seizures.

The way seizures spread through the brain also seems to differ depending on sleep state. Interestingly, frontal lobe seizures begin during sleep more often than temporal lobe seizures. However, temporal lobe seizures are more likely to spread and result in a convulsion when beginning during sleep, while frontal lobe seizures are not. This intriguing finding could have implications for treatment if better understood.

Sleep Deprivation

Sleep deprivation, whether due to sleep disorders, nocturnal seizures, or simply not sleeping enough, has long been thought to increase the risk of seizures. In specific syndromes, such as juvenile myoclonic epilepsy, this relationship can be quite dramatic to the point where seizures rarely or never happen when sufficient sleep is obtained. Sleep deprivation also increases the risk of partial seizures in many patients particularly when occurring frequently. This can be due to sleep disorders from outside influences like poor sleep hygiene, or because patients are busy and simply do

not get enough sleep. Any of these influences can result in increased seizures, further disrupting the already limited sleep time, and leading to a vicious cycle of sleep disruption and intractable seizures. In this scenario, seizures are not likely to be controlled unless the sleep disruption is also resolved.

Finally, certain circadian rhythms may influence seizures independently of sleep. Patients with intractable temporal lobe epilepsy show abnormal secretion of melatonin, a sleep related hormone with a characteristic circadian pattern. Taking supplemental melatonin has been shown to help control seizures in a few small studies, raising the possibility that it may be useful in the treatment of some patients. However, further research is needed to know which patients are most likely to benefit.

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