By Steven Karceski, MD

Reducing Anxiety During Medical Procedures in People with Epilepsy

Surgical procedures are always anxiety inducing, but for epilepsy patients the concerns are even greater. Here's a look at what to consider.

Epilepsy is a common neurological illness, affecting one to three percent of the general population—including Chief Justice of the Supreme Court John Roberts, as was just revealed last month. Since it's a chronic condition, people with epilepsy may be on a medication regimen for many years, if not lifelong. At some point, it's inevitable that a person with seizures may require tooth extraction, cosmetic surgery or a lifesaving surgical procedure. Often, this situation creates anxiety for the patient and physician alike.

Will a seizure occur during the procedure? If a seizure did happen, could the person be seriously injured? What kind of anesthetic should be used? At the time of a procedure, the person may need to refrain from taking their AED—how should seizure medications be taken, if at all? What kind of postoperative care is needed? These are just a few questions that contribute to increased anxiety regarding medical procedures in people with epilepsy.

Seizures at the Time of the Medical Procedure

One of the first concerns to overcome is: will a seizure occur during the procedure? The answer depends on the patient, and partly on seizure frequency. On one end of the spectrum is the person who has had no seizures for many years. He or she may be on antiseizure medication, and the likelihood that a seizure would occur at the time of a procedure is very small.

On the other end of the spectrum is the 30 to 40 percent of people who have seizures that do not respond completely to medications. It has been estimated that 25 to 30 percent of people with seizures will experience a seizure more than once a month.[1] Much less often, a person may experience seizures several times per day. In this rare instance, the likelihood that a seizure may accompany a medical procedure is much higher.

The kind of seizure may be an important factor to consider. Partial seizures can become secondarily generalized. Also called convulsions, generalized tonic-clonic seizures (GTCs) are the most clinically obvious, consisting of generalized stiffening followed by rhythmic clonic movements in all four extremities. Complex partial seizures may cause stiffening of one arm or leg, or may be accompanied by more subtle motor manifestations such as lip smacking or lip pursing (also known as oral automatisms). Simple partial seizures, which by definition cause no alteration or loss of awareness, may not manifest any motor signs.

There is a longer list of possible generalized seizures. Generalized from onset tonic-clonic seizures are, for the most part, clinically identical partial-onset GTCs. Absence seizures are brief, and manifest as staring and unresponsiveness. Absence seizures usually go unnoticed as they rarely are accompanied by obvious clinical signs. Myoclonic seizures are very brief, lasting only a fraction of a second, causing "jerking" of the extremities or the body. Often, myoclonic seizures occur in the early morning, shortly after awakening. If a person experienced this type of seizure, and it occurred often, the procedure might be best performed later in the day to minimize potential problems.

If a seizure were to occur at the time of the procedure, intravenous medications such as lorazepam may be administered. Unless contraindicated by the procedure itself, lorazepam is a rapidly effective seizure-suppressing medication for many people. A medical decision would need to occur: should the procedure be stopped? For routine medical testing, the procedure might be rescheduled. In a surgical procedure, the benefit of discontinuing the surgery may need to be weighed against the risk of continuing the procedure.

Seizure Meds at the Time of a Procedure

Knowing about the person's seizure type (and epilepsy syndrome) is only one factor that can minimize seizures during a medical procedure. The other is to know the list of seizure medications, the dosing schedule and the time of dosing. For many procedures, a person will be asked to refrain from eating or drinking ("nothing by mouth" or NPO). Often, the anesthesiologist will ask the person to stop eating at midnight on the evening prior to the procedure. This assures that the person will have an empty stomach at the time of the planned procedure, minimizing nausea and vomiting, a common response to anesthetic agents.

For people who are taking chronic medications, exceptions may be made. Medications taken with "sips" of water on the day of the procedure may be allowed. The patient should ask their anesthetist what is most appropriate. If there is con-

fusion, a doctor-to-doctor conversation should occur, clarify what is most appropriate. In virtually all patients, taking medications "as usual" is ideal, and minimizes the risk of seizures during the procedure itself.

One infrequent exception occurs in the setting of surgery on the gastrointestinal system. For a variable period of time after the procedure, the person may experience an *ileus*, or temporarily decreased peristalsis of the intestines. Oral medications do not move through the intestines, and therefore may not be absorbed. In these instances, an intravenous formulation may be temporarily needed. If no IV form of the person's usual antiseizure medication is available, an alternative agent will be needed. Before a planned procedure, the patient, Neurologist and Surgeon should have a discussion as to which IV medication may be most appropriate in that situation. IV phenytoin does not cover all seizures equally well, and should not be considered the "default" medication in these situations.

In other circumstances, it might be possible to administer the antiseizure medication rectally.[2] Many AEDs are rapidly absorbed through the rectal mucosa. For instance, carbamazepine and valproate can be given *per rectum* (the accepted abbreviation is PR) as a maintenance dose. Valproate is now rarely given in this form as it is available in an IV formulation under the trade name of Depacon. If a PR medication is needed, the physician will need to talk with the inpatient pharmacy to determine the best way to prepare and administer the medication. Because of how infrequently these medications are administered PR, nursing may need to be involved in this conversation as well.

Anesthetic Agents

Anesthetics can be anticonvulsant or proconvulsant.[1,2] This property has been attributed both to general anesthetics as well as local ones. Why an anesthetic might have both is poorly understood, however. For some antiseizure agents, the effect on the central nervous system is a concentration effect.[2] For others, the effect is less predictable. Volatile agents are often used for general anesthesia. Methoxyflurane and halothane are the least seizure-producing; enflurane is the most.[2] Enflurane is a commonly used inhalation anesthetic. It lowers the seizure threshold. Higher doses cause greater CNS excitability, as has been measured in some studies using EEG during the procedure. In people with seizures, the choice of anesthetic(s) may need to be modified. As with the choices of seizure medications or medication formulation, this decision should occur before the planned procedure.

Local anesthetics also have either anticonvulsant or proconvulsant effects. Lidocaine is the most commonly used local anesthetic agent. Low doses can stop status epilepticus. High serum concentrations of lidocaine cause seizures.[2] When used as a local anesthetic, however, the absorption is very low. Unless the medication is accidentally administered intravenously, the risk that this will occur is similarly very low.

Conclusions

People with seizures often need medical procedures at some point in their lives. There are concerns that a seizure might occur at or around the time of the procedure itself. Often, these concerns can be addressed before the procedure occurs. A discussion between the neurologist, surgeon and anesthesiologist should cover these concerns. In addition, a decision should be made as to how to optimize AED administration around the time of the procedure. Addressing these concerns will not avert all peri-procedural seizures, of course. However, a discussion with the treating team may allay any fears while simultaneously minimizing seizure occurrence. **PN**

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