

Rectal Diazepam

Dr. Bryan E. Bledsoe

The patient who is actively seizing presents several management problems for prehospital personnel. Most seizures are self-limited and as a rule, not life threatening. Status epilepticus, on the other hand, is a life-threatening medical condition typically defined as a continuous seizure lasting at least 30 minutes or as a series of seizures in which there is not a return to consciousness in between. Prolonged seizure activity can cause severe lactic acidosis, hyperglycemia or hypoglycemia, hyperthermia and shock.

The acute treatment of seizures primarily involves maintenance of the airway, protection of the patient from injury, supplemental administration of oxygen, and administration of anticonvulsant medications. These goals are difficult to achieve in the actively seizing patient. In order to care for the patient, the seizure must be terminated with a rapidly acting anticonvulsant medication. Diazepam (Valium), a rapidly acting anticonvulsant, is routinely used in emergency medicine to suppress seizure activity. The earlier the medication is administered, the greater the chances of terminating seizure activity.¹

Obtaining intravenous (IV) access in a patient who is actively seizing is difficult. Alternate routes of anticonvulsant medication administration have been investigated and the rectal administration of diazepam has emerged as a safe, rapid, and effective way to terminate seizure activity.

Dr. Robert S. Seigler reviewed 18 studies involving 755 patients who received a total of 840 doses of rectal diazepam.² Fourteen of these studies were of children and four were of adults. The results suggest that rectal diazepam is safe and effective in terminating seizure activity when an IV cannot be established.

Knudsen studied the effectiveness of rectal diazepam in 44 children.³ Rectal diazepam terminated seizures in 96 per-

cent of patients when seizures were treated within 15 minutes of initial activity. Rectal diazepam was effective in 57 percent of treated children when seizure activity lasted longer than 15 minutes.

Rectal Administration

For the pediatric patient, a starting dose of 0.5 milligram per kilogram of body weight is typically used. Adult dosage in the studies cited by Seigler ranged from 10-30 milligrams rectally and the medication is administered in its undiluted form (5 mg/1 ml).

In a young child, the appropriate dose of diazepam should be drawn up in a one milliliter tuberculin syringe, then, the needle should be removed, and a water-based lubricant gel should be applied to the barrel of the syringe. Next the syringe is inserted four to six centimeters into the rectum, and the medication administered.

For the adult patient, the correct dosage of medication should be drawn up in a three or five milliliter syringe. Then, the plastic catheter from an 18 gauge IV catheter should be removed from its stylet and placed on the syringe. The catheter should be placed four to six centimeters into the rectum and the drug administered. The time between administration and "therapeutic" serum levels of the drug ranges from four to 11 minutes.

It is essential that the medication be administered in the portion of the rectum 4 to 6 centimeters above the anus so the medication will be adsorbed from the rectum into the inferior and middle hemorrhoidal veins which empty into the inferior vena cava. This rapidly delivers the medication to the body without it first passing through the liver. Administration of the medication lower in the rectum may result in expulsion of the medication. Placement too far into the rectum will cause the medication to be adsorbed from the superior hemorrhoidal veins which drain into the portal circulation, thus re-

quiring the medication to first pass through the liver. Some breakdown of the medication occurs as it passes through the liver which may delay achievement of therapeutic levels of the drug in the blood.

Safety of Rectal Diazepam

Rectal diazepam, although relatively safe, still shares some of the potential complications seen with IV administration. Respiratory depression, sedation, and other similar side effects are possible and therefore resuscitation equipment and supplemental oxygen should be readily available.

Summary

Acute seizures are a common reason for summoning EMS. Seizures, as a rule, are not life-threatening however, it is often prudent to attempt to stop seizure activity with appropriate anti-convulsant medications, especially if status epilepticus is suspected. Following assessment and management of the airway, breathing, and circulation, anticonvulsant medications such as diazepam can be administered. The preferred route of drug administration is IV where therapeutic blood levels are quickly achieved. However, venous access in the actively seizing patient is often difficult. In these cases, administration of diazepam into the rectum offers a safe and effective way to terminate seizure activity.

References

1. Uthman, BM and Wilder, BJ: Emergency management of seizures: An Overview. *Epilepsia* 30:S33-37 1989.
2. Seigler, RS: The administration of rectal diazepam for acute management of seizures *The Journal of Emergency Medicine* 8:156-159, 1990.
3. Knudsen, FU: Rectal administration of diazepam in solution in the acute treatment of convulsions in infants and children. *Archives of Diseases of Children* 54: 855-57, 1979.