Rescue Medicine for Epilepsy in Education Settings

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Children and adolescents with epilepsy may experience prolonged seizures in school-associated settings (eg, during transportation, in the classroom, or during sports activities). Prolonged seizures may evolve into status epilepticus. Administering a seizure rescue medication can abort the seizure and may obviate the need for emergency medical services and subsequent care in an emergency department. In turn, this may save patients from the morbidity of more invasive interventions and the cost of escalated care. There are significant variations in prescribing practices for seizure rescue medications, partly because of inconsistencies between jurisdictions in legislation and professional practice guidelines among potential first responders (including school staff). There also are potential liability issues for prescribers, school districts, and unlicensed assistive personnel who might administer the seizure rescue medications. This clinical report highlights issues that providers may consider when prescribing seizure rescue medications and creating school medical orders and/or action plans for students with epilepsy. Collaboration among prescribing providers, families, and schools may be useful in developing plans for the use of seizure rescue medications.

BACKGROUND

Nearly 1% of US children have a lifetime prevalence of epilepsy, making epilepsy one of the most common neurologic diagnoses.1 With the advent of the Individuals with Disabilities Education Act (Pub L No. 101-476 [1990]) and Individuals with Disabilities Improvement Act (Pub L No. 108-446 [2004]), the vast majority of children and adolescents with epilepsy attend some form of school outside the home, and thus, assurance of the safety of students with epilepsy is an important aspect of daily school life. Some patients have seizures that are well controlled by medicines, but a significant proportion will never achieve complete seizure control.2 Importantly, it is more difficult to stop a prolonged seizure than a brief seizure, and the longer the seizure, the longer the recovery period.3 Therefore, it is recommended that school
personnel be aware of emergency intervention measures that are needed in the school setting in the event of a seizure. Some students may experience prolonged seizures (ie, >5 minutes) or clusters of multiple brief, recurrent seizures that will require pharmacologic intervention. The goal of this report is to make prescribing professionals (physicians, physician assistants, or nurse practitioners who are licensed to prescribe medicine in their state) aware of some of the issues faced by school personnel who care for students with an established diagnosis of epilepsy and known responses to seizure rescue medications. A recent report from the United Kingdom recommended better integration between schools, providers, and families of students. Similar issues have been discussed regarding school-based management of asthma, diabetes, and food allergies.

**SCHOOL ACTION PLANS FOR STUDENTS WITH EPILEPSY**

All students with special health care needs, including children with epilepsy, warrant advanced thought and planning by a team of the medical home, the school home, and the family home before attending school. Seizure management can be challenging for school personnel, especially when school nurses are not available and unlicensed assistive personnel (ie, people working in the school setting who volunteer to be trained by a school nurse to assist a child or adolescent through an action plan) are available until medical help arrives. Ideally, school nurses rely on prescribing professionals for medical orders to manage children with epilepsy in the school setting. School nurses may then write effective action plans based on those medical orders in simple language, such as “If you see this …, then do this…” for use by school unlicensed assistive personnel whom the school nurse has trained to assist a child in the school nurse’s absence. However, in settings where there are no school nurses, some schools may ask prescribing professionals to provide them with an action plan instead of technical medical orders, and some may even ask prescribing professionals to provide training to unlicensed assistive personnel or other school staff. In those instances, prescribing professionals may be the ones to create a school action plan or to modify a generic one (ie, from www.epilepsyfoundation.org) and modify customizable action plan templates. An important component of these plans is communication from school personnel to the family and/or physician about the frequency of reporting seizure rescue medication use (both to make them aware of a lowered seizure threshold and to reassess the adequacy of standing medication doses). Links to other information on epilepsy in school also can be found on the American Academy of Pediatrics Council on School Health Web site (www2.aap.org/sections/schoolhealth, under “Resources”).

There are certain factors for prescribing professionals to consider when writing a seizure action plan. In general, seizure rescue medications are given once a seizure has lasted 5 minutes to prevent progression to status epilepticus, but this can be modified on the basis of observations made by those caring for the patient at home and school. For example, some patients have short seizures that, if allowed to continue for longer than 1 minute, will result in status epilepticus. In this case, the provider may prescribe seizure rescue medications to be given as soon as the seizure begins. In considering what to include in medical orders or an action plan, the prescribing professional typically will account for concomitant medications and past reactions to different medicines. Other factors to consider include an understanding of when a child is safe to remain in school after a seizure or when further medical care outside of the school setting is indicated.

**SEIZURE RESCUE MEDICATION OPTIONS**

Prescribing professionals have a number of medication options, each with distinct properties. Standard medication references are available for further information on each drug.

**Rectal Diazepam Gel**

One of the most widely used seizure rescue medications, rectal diazepam gel is particularly useful for patients when oral administration of a seizure rescue medication may be contraindicated. However, it requires a patient to be partially undressed, which can be viewed as problematic for the patient, school staff, and other students, especially in partially conscious students when there is no ready means of privacy to preserve the patient’s dignity. Families may appreciate consultation about these issues before formulation and implementation of an action plan. Furthermore, school nurses may not always be available to administer the medication, such as on the school bus or athletic field, leaving the medication administration to other personnel who may be unwilling or uncomfortable with engaging in an activity that could be viewed as an intimate or invasive interaction with a child.

**Midazolam**

Midazolam is increasingly being used by emergency medical services because of its short elimination half-life (2.5 hours), allowing patients to be more awake when they arrive in the emergency department. An oral syrup (2 mg/mL) is also available and can be used for buccal administration, with the patient lying on his or her side, provided...
the patient does not have copious secretions or emesis during the seizure. Some pharmacies have also adapted the use of syringes to deliver the intravenous form of midazolam intranasally (eg, via an atomizer), and this has been demonstrated to be effective when administered by family caregivers. One attractive feature of midazolam is that it avoids the inconveniences and emotional discomfort associated with rectal diazepam gel. Premade syringes may improve the safety of this medication in school settings (ie, similar to rectal diazepam gel). Unlicensed assistive personnel typically are not asked to administer this medicine if it has not been dispensed in a premeasured syringe (similar to rectal diazepam gel). If the intranasal formulation is prescribed, then additional training of school personnel may be considered because this is a relatively new route of administration.

**Lorazepam**

Lorazepam is another benzodiazepine available as an oral solution (2 mg/mL) and can be used for oral administration, provided the patient does not have copious secretions or emesis during the seizure. However, it is recommended that lorazepam be refrigerated, making it less practical for settings outside of school. Similar to midazolam, premeasured syringes may improve the safety of this medication in school settings. Unlicensed assistive personnel typically are not asked to administer this medicine if it has not been dispensed in a premeasured syringe (similar to rectal diazepam gel).

**Clonazepam Orally Disintegrating Tablet**

Available as an orally disintegrating tablet in different doses, clonazepam is another option. Prescribers may include specific instructions about positioning a child on his or her side to drain secretions, as well as how to safely position the medication into the buccal mucosa to avoid injury by a patient’s clenched teeth.

**PRACTICAL ISSUES IN EDUCATIONAL SETTINGS**

Initial considerations of both the type and timing of seizure rescue medication administration include the cognitive awareness of the student and other students in that setting, as discussed previously. Medical intervention does not stop with the initial administration of the seizure rescue medication. Adverse effects of all seizure rescue medications include decreased respirations, oversedation, and cardiopulmonary instability, which may vary in severity depending on the duration of the seizure, dose of the seizure rescue medication, and interactions with other medicines.

Schools generally appreciate guidance from the prescribing professional about management of potential adverse effects of seizure rescue medications, either outlined in medical orders to a school nurse or in simple language of an action plan for unlicensed assistive personnel. As with any medical emergency, the availability of cardiopulmonary resuscitation–trained personnel is suggested. With seizure rescue medications, prescribing professionals may provide guidance about the types of situations in which school personnel should seek further medical assistance if the student’s seizure does not stop or if there is a concern for further seizure- or treatment-related complications. On one hand, this is particularly important for a child who is not responding to treatment. On the other hand, specific guidance may be helpful for a child with frequent seizure activity where recurrent transportation to an emergency department is neither feasible nor desirable or even when school nurses are not the ones attending to the child. The recommended duration of basic observation after administering a seizure rescue medication can account for practical circumstances (eg, staffing availability in the school or classroom) and ultimately may determine whether administration of a seizure rescue medication in the school setting is indeed both safe and realistic.

As noted previously, staffing varies between schools. School nurses are not available in every jurisdiction and, even when available, may not always be immediately available to assist in the case of a seizure. For example, in some areas, a single nurse may be assigned to a group of schools. In this situation, the nurse’s ability to respond in a timely fashion depends on factors such as distances between school buildings, nurse-to-student ratios, and available assistance within a school to leave the health office uncovered to respond to a child in need. Availability of school nurses also becomes an issue when prescribing seizure rescue medications because administration of medicine by others may be illegal in some jurisdictions. In states with strict licensure laws, for example, schools without school nurses might be required to hire a one-on-one private duty nurse (licensed practical nurse or registered nurse) for the student to deliver the seizure rescue medication. Conversely, one-on-one nursing is expensive, and furthermore, hovering over a child waiting for a seizure to occur is highly restrictive and interferes with the child’s ability to socialize and participate in normal classroom activities. Finally, the school setting encompasses not only the classroom during the school day but also bus transportation, activities before and after school, and off-campus activities, such as athletics and field trips. Aspects of the individual action plan that include transportation to and from school activities can be included in the Individualized Education Plan...
(IEP) to optimize student safety.\textsuperscript{23} In certain circumstances, safety may be greater in school-based transportation than private vehicles. Furthermore, availability of school nurses or properly trained staff may not be consistent in every situation, and the action plan may account for this factor. Questions as to whether school nurses are available to create action plans, administer seizure rescue medications, and provide training to unlicensed assistive personnel or whether prescribing professional medical orders are going to be managed only by unlicensed assistive personnel are best answered for prescribing professionals by principals or other heads of school. Information from an individual action plan may be included in an IEP or 504 accommodation.

LEGAL CONSIDERATIONS

Fears concerning potential liability are real. Thus, it is recommended that providers who care for children with epilepsy (including prescribing professionals, nurses, and school personnel) be aware of local laws regarding administration of seizure rescue medications by school personnel and their personal liability for errors. In some jurisdictions, unlicensed volunteers who assist a child during a seizure may bear legal responsibility in the case of a bad outcome, including potential tort action. In addition, if school transportation services have been contracted out to local private companies, transportation workers may not be employees of the school district. This may raise additional potential liability issues beyond those borne by school districts, with some private transportation companies prohibiting the involvement of their employees in the case of a medical emergency. In these situations, an action plan that contains instructions on seizure management for unlicensed assistive personnel (for both the school district and private agencies) may ease fears and ensure the provision of appropriate care. Furthermore, education of school administrators and Boards of Education by prescribing professionals may heighten awareness for school districts to consider matters such as the willingness to assist students with special health care needs in their selection of health office staff and contractors for student services in general.

SUMMARY

Although care for a child with epilepsy varies because of inconsistencies between jurisdictions in legislation, professional practice guidelines, and potential liability issues, children with epilepsy warrant advance planning for medical emergencies.

Key Points

1. It is important for prescribing professionals to familiarize themselves with the local and state regulations and local school limitations and resources for treating students with seizures.

2. Children with prescriptions for seizure rescue medications may benefit from an individualized action plan that is developed collaboratively among the family, the prescribing professional, and the school.

3. An individualized action plan will be most effective if it takes into consideration the possible options for the least restrictive medication choice (ie, buccal or nasal route) for the child in his or her environment while ensuring the child’s safety.

4. An individualized action plan can also include details of when to activate emergency medical services, depending on the patient and available resources.

5. Prescribing professionals can educate school personnel about seizure management or may direct them to educational programs offered by national or local organizations with appropriate expertise.

6. Details of the individual action plan and transportation can be included in the IEP or 504 accommodation.

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