CEREBRAL PALSY: DRUG TREATMENTS FOR SPASTICITY IN CHILDREN AND ADOLESCENTS

This fact sheet may help you understand which drugs are the best choices for treating spasticity in children and adolescents who have cerebral palsy.

Neurologists from the American Academy of Neurology are doctors who identify and treat diseases of the brain and nervous system. The following evidence-based information* is provided by experts who carefully reviewed all available scientific studies on drugs for treating spasticity in children and adolescents with cerebral palsy.

What is cerebral palsy?

Cerebral palsy involves several brain disorders. These disorders cause problems with movement and posture. For some people, other functions are also affected. These include the ability to learn, hear, see, or think.

Cerebral palsy is caused by damage to the brain. The damage is in brain areas that control movement. The brain damage usually occurs before birth or within the first year after birth. The brain damage does not worsen, but some of its effects in the body may get worse with time. For example, increased muscle tightness (spasticity) and weakness can lead to bone and joint problems.

Cerebral palsy has many causes. Brain damage before birth is the cause in over two-thirds of the cases. The other cases are caused by a brain injury, such as a trauma or infection, sometime after birth.

There is no known cure for cerebral palsy. But treatments may ease symptoms. They can help the child move and participate in daily activities with some independence.

What is spasticity?

Spasticity is muscle tightness that interferes with movement. The affected muscle contracts or tightens. This tightening gets worse the faster the muscle is pulled or stretched. People with spasticity have problems tightening and relaxing their muscles. They often cannot move in a coordinated and effective way. A majority of children with cerebral palsy have spasticity.

Spasticity can be localized. This means it affects only one half or one part of the body, such as the calf muscles. It also can be generalized. This means it affects muscles throughout the body.

How can localized spasticity be treated effectively and safely?

Several drugs are available to treat the symptoms of localized spasticity. These drugs are injected into the affected nerve and/or muscle. Strong evidence shows that botulinum toxin type A (BoNT-A) reduces spasticity that is limited to specific body parts. But it is not known if BoNT-A improves the child's motor function (control of muscles or movements), quality of life, or participation in daily activities. As of January 2010, the US Food and Drug Administration (FDA) has not approved BoNT-A use to treat spasticity in children. However, BoNT-A is commonly used as an "off-label" medication in the United States for treating spasticity in children and adults. It has been approved for this use in several countries outside the United States.

In general, the evidence shows that BoNT-A is safe to use in children with cerebral palsy, but severe muscle weakness may occur. The FDA issued a safety alert on use of botulinum toxin (BoNT), both types A and B, in 2009. The alert warns of a possible toxic effect from BoNT injection. The FDA also has provided a guide to BoNT safety risks. For more information, visit *www.fda.gov/Drugs/DrugSafety/PostmarketDrugSafetyInformationforPatientsandProviders/DrugSafetyInformationforHeathcareProfessionals/ucm174959.htm.*

Doctors often use other therapies with BoNT-A to treat spasticity. These include use of casts or braces to support the affected body parts. They also may order physical or occupational therapy. The therapist will help to relax muscles, maintain range of motion, and improve muscle strength and mobility. The therapist also will help choose devices that aid movement. The goal is to improve quality of life and participation in daily activities.

There is not enough evidence to show if botulinum toxin type B (BoNT-B), phenol, or alcohol injections help relieve spasticity.

How can generalized spasticity be treated effectively and safely?

Several oral drugs (taken by mouth) are available to treat symptoms of generalized spasticity. Good evidence shows that diazepam likely reduces generalized spasticity. However, this drug has some risk of dependency when used long term. It also may cause side effects, including drowsiness, sleepiness, drooling, and muscle weakness. There is weak evidence that tizanidine may reduce generalized spasticity. Studies of its use in adults report side effects such as low blood pressure, sleepiness, muscle weakness, and dizziness. There is also a risk of liver damage. There is not enough evidence to show if diazepam or tizanidine improves the child's motor function, quality of life, or participation in daily activities.

Not enough evidence is available to show if dantrolene or oral baclofen reduces generalized spasticity in children with cerebral palsy. Also, there is not enough evidence to show if these drugs improve motor function, quality of life, or participation in daily activities in these children. Doctors often prescribe baclofen to treat spasticity in children with cerebral palsy. Experts recommend starting at the lowest possible dose to lessen side effects like drowsiness or sleepiness. They also warn against stopping the drug quickly, as this may lead to more severe side effects.

Another drug option is intrathecal baclofen (ITB). The drug is pumped constantly to the spinal cord through a tube. The ITB pump is implanted under the skin of the abdomen. There is not enough evidence to show if ITB use relieves generalized spasticity in children with cerebral palsy. In 1996, the FDA approved ITB use to treat spasticity linked to certain brain disorders. Risks of ITB use include infections from placement of the pump and problems from catheter use. The catheter is the tube that delivers the drug to the spinal cord.

My child has cerebral palsy and has spasticity. How can I know which treatments are right for my child's needs?

Choosing a treatment takes careful thought. Talk with your child's doctor or medical team and share your goals for the treatment. This will help you and the medical team to set specific goals that can be measured and reached in a realistic and timely way. It is a good idea to involve your child in this discussion as well, when appropriate. Important goals to aim for are independence, social participation, pain relief, and ease of movement and care. It is important to work with specialists who have experience treating children with cerebral palsy, especially in prescribing drugs.

Be sure to weigh the benefits and risks of treatment carefully. Not all children with cerebral palsy should receive treatment for spasticity. For some, this treatment may interfere with motor function. Keep in mind that spasticity is just one of many problems that children with cerebral palsy face. The types of problems vary from child to child. For example, the needs of the child who is able to walk differ from those of the child who cannot walk. Children with cerebral palsy often are helped by physical therapy and occupational therapy, orthopedic surgery, and use of braces, walkers, wheelchairs, and communication devices.

At this time, there is not much high-quality evidence for some of the treatments for cerebral palsy problems. As of January 2010, the National Institutes of Health is sponsoring a large study on oral baclofen use. It is hoped that studies such as this will provide better evidence of the effectiveness and safety of this and other treatments.

*After the experts review all of the published research studies, they describe the strength of the evidence supporting each recommendation:
Strong evidence = more than one high-quality scientific study
Good evidence = at least one high-quality scientific study or two or more studies of a lesser quality
Weak evidence = the studies, while supportive, are weak in design or strength of the findings
Not enough evidence = either different studies have come to conflicting results or there are no studies of reasonable quality

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