



8 Feb, 2008

Dr. Stephen Cha  
Professional Staff  
Committee on Oversight and Government Reform  
U.S. House of Representatives  
Regarding: Injection therapies for low back pain.

Dr. Cha:

As per our telephone discussions, I will try to respond to your questions regarding the possible use of injectable lidocaine for the treatment of pain.

1. What are the types of injections used for low back pain? A variety of different types of injections may be employed for the treatment of low back pain. They include rather complicated techniques such as transforaminal steroid injections, which may include a combination of local anesthetic and corticosteroid, or facet joint injections (dorsal or medial branch nerve blocks or zygoapophysial joint injections) which are generally performed under radiographic guidance. These types of injections are commonly performed by highly trained medical or surgical physician specialists, with fluoroscopic or ultrasound guidance. Some physicians will attempt "blind" facet blocks using a large volume of local anesthetic and surface anatomical landmarks. These are of questionable value as a pain treatment, and have no benefit as a diagnostic approach. However, there are a number of other, less complicated types of injections that may be applied. These injection techniques are often less specific and require less training. Examples include trigger point injections, which usually contain a local anesthetic (such as lidocaine or bupivacaine) and occasionally a corticosteroid to reduce inflammation, and tendon sheath injections. They commonly target taut bands or very sensitive areas in the muscle (trigger point) that elicit a jump sign when the muscle is palpated. Other ingredients may be included in the injection, including vitamin B-12, the nonsteroidal antiinflammatory agent ketorolac, botulinum toxin, and iced saline. Much of the science behind these additives is lacking, but is often applied on a theoretical basis. Finally, there is a form of therapy that employs a strategy known as prolotherapy. This approach goes counter to the common approach of trying to alleviate inflammation, and instead attempts to induce inflammation to facilitate healing by introducing hypertonic or other irritating substances to produce irritation. The theory being that inflammation will induce healing and promote the production of collagen to strengthen the tendons and muscle aponeurosis. Local anesthetics may be combined with dextrose or sodium morrhuate to produce this "regenerative effect". Unfortunately, solid data to support the benefit prolotherapy or trigger point injections with these more elaborate concoctions is lacking, as simply needling or injecting saline can produce the same effect. This has been one of the big problems in demonstrating the benefits of botulinum toxin for trigger point injections for

many pain problems, since the control group often responds with evidence of improvement from the saline alone.

2. What are the risks associated with these procedures? The risk varies by location. Injections in and about the spine carry the risk of infection, bleeding, nerve injury, spinal anesthesia, and possibly intraarterial injections, that have resulted in infarct of the spinal cord. Trigger point injections can produce local bleeding (hematoma), muscle soreness, local anesthetic toxicity if a large amount or many injections are performed, and adrenal suppression if performed frequently with corticosteroids. Unrecognized injection into a vein or artery can produce seizures and possibly cardiac arrest, depending on the anesthetic amount and type. Additionally, local anesthetics have the potential to produce myotoxicity, and can actually damage the muscle tissue causing necrosis and fibrosis. Proper trigger point injections usually only involve small volumes of less than 1ml of anesthetic at each tender point, so toxicity is quite rare. Injection techniques are not necessarily difficult to learn, as many patients are quite capable of managing their own insulin injections. The key to treating pain problems, is having an adequate anatomical background and diagnostic skills to determine the appropriate treatment. I do not know whether athletic trainers are trained in injection therapies. There is the potential for harm in unskilled/untrained hands.
3. Lidocaine drugs? Lidocaine is a local anesthetic of the amide class. It is available in a variety of concentrations for topical and parenteral injections, some of which contain preservatives. Lidocaine may also be used to treat arrhythmias of the heart, and is sometimes administered intravenously to treat certain types of pain. Generally, lidocaine is injected into skin, tissues, joints, and tendon sheaths to produce local anesthesia. It may also be delivered around peripheral nerves, and the nerves of the spine to produce regional anesthesia. Lidocaine has a relatively short duration, producing local anesthesia that lasts for only 1-2 hours in most areas. Longer acting local anesthetics include ropivacaine, bupivacaine, and tetracaine can be employed to achieve more prolonged anesthesia, the duration varies with the location injected, but typically only lasts for 4-6 hours. The longer acting local anesthetics tend to be more toxic, and the amount injected should be monitored. When appropriately directed for trigger point injections, the analgesia may be long-lasting, well beyond the effect of the medication.
4. Potential dangers of local anesthetics? Considerations in using local anesthetics must include concern for the total amount injected, how frequently injected, and where it is injected. Injections near the spine must be carefully administered. A small volume of lidocaine injected into the spinal fluid of the lower back can produce a spinal anesthetic capable of causing a marked drop in blood pressure and heart rate, occasionally leading to a cardiac arrest. Accidental injection into a blood vessel may cause a general tonic clonic seizure, and potentially cardiac arrhythmias or arrest. Systemic toxicity usually involves large doses of lidocaine, exceeding 250mg (25ml of a 1% solution). Other concerns with anesthetic injections include: myotoxicity, muscle soreness, infection, hematoma, and inadvertent nerve blockade that can produce weakness in the extremities.

Additional complications may occur if other additives are combined with the anesthetic, such as epinephrine, corticosteroids, botox...

I hope this information is helpful.

Sincerely,

A handwritten signature in black ink, appearing to read 'Fred Burgess', with a long horizontal flourish extending to the right.

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