FAST FACTS AND CONCEPTS #180 PDF

Author(s): Jay Thomas MD, PhD

Background In recent years reports have described the use of parenteral lidocaine for neuropathic pain. This Fast Fact reviews the use of parenteral lidocaine for neuropathic pain.

Mechanism Lidocaine is a local anesthetic that is a nonselective sodium channel blocker. Sodium channel blockade is thought to be responsible for analgesia. Studies in animals and humans demonstrate that injured nerves develop abnormal, spontaneously active sodium channels at sites of nerve injury, along damaged nerves, and at the dorsal root ganglia of damaged nerves. Lidocaine can suppress this ectopic, spontaneous firing of aberrant sodium channels at concentrations that do not affect normal nerve or cardiac conduction.

Clinical Trial Data

- Small controlled studies have established systemic lidocaine to be effective in the relief of diabetic neuropathy and post-herpetic neuralgia.
- A meta-analysis concluded that systemic lidocaine is superior to placebo for neuropathic pain, is as effective as other adjuvant analgesics, and is well tolerated.
- Two small controlled trials in cancer pain found no benefit of systemic lidocaine. However, other case reports and one retrospective study support its use.
- One trial indicated that an analgesic response to lidocaine is a predictor of a successful response to mexiletene, an oral congener of lidocaine. In practice, the validity of this finding has been questioned, and a high rate of side effects (predominantly gastrointestinal) from mexiletene have limited its use.

Dosing

- Multiple regimens have been described.
- Typically a bolus dose between 1-5 mg/kg is administered intravenously over 15 to 60 minutes depending on the dose.
- Time to analgesia has been reported from being between 1-45 minutes.
- If patients respond to initial bolus, ongoing IV or subcutaneous infusions can be provided over days to months depending on response.
- Serum lidocaine levels should be followed at steady state (t½ ~100 minutes, so 3-5 half-lives for steady state ~5-8 hrs) and intermittently afterwards as clinically indicated. A target level of 2-5 mg/liter is based on dose-response studies and avoidance of side effects as below.

Adverse Reactions Lidocaine has dose-related side effects that become progressively more severe at levels higher than 5 mg/liter, including myoclonus (~8 mg/l), seizures (>10 mg/l), and cardiovascular collapse (>25 mg/l). Although lidocaine after a myocardial infarction has been associated with a trend towards increased risk of arrhythmias, cardiac monitoring during studies of normal volunteers and patients has noted no cardiac risks at clinically appropriate levels. Lidocaine is rapidly and extensively metabolized by the liver. Metabolites are excreted by the kidney, thus adjustments may be needed in the case of liver and renal insufficiency, guided by monitoring steady state blood levels.
Summary There is weak, largely non-controlled evidence that systemic lidocaine can relieve neuropathic pain in selected patients. Definitive evidence to support its use in cancer pain (both neuropathic and opioid-refractory) awaits further prospective trials. Most practitioners, however, would not use it as a first line treatment and a pain or palliative care consult should precede its use.

References


Fast Facts and Concepts are edited by Drew A Rosielle MD, Palliative Care Center, Medical College of Wisconsin. For more information write to: drosiell@mcw.edu. More information, as well as the complete set of Fast Facts, are available at EPERC: www.eperc.mcw.edu.


Disclaimer: Fast Facts and Concepts provide educational information. This information is not medical advice. Health care providers should exercise their own independent clinical judgment. Some Fast Facts cite the use of a product in a dosage, for an indication, or in a manner other than that recommended in the product labeling. Accordingly, the official prescribing information should be consulted before any such product is used.

ACGME Competencies: Patient Care

Keyword(s): Pain – Non-Opioids