MedStar Georgetown University Hospital

IV Lidocaine Infusion Protocol

Background

Low dose IV lidocaine infusions are being used intraoperatively and postoperatively as part of a multimodal approach to decrease pain and reduce opioid requirements. Systemic lidocaine has anti-nociceptive, anti-hyperalgesia, and anti-inflammatory properties. It can also possibly lead to a decrease in postop nausea and vomiting and a faster return of bowel motility. When used appropriately, adverse effects are rare.

Indications

- Open abdominal surgery
- Laparoscopic surgery
- Multilevel spine surgery
- Thoracic surgery
- Prostatectomy
- Mastectomy
- Opioid tolerant patients and chronic pain patients
- Patients who are at higher risk for adverse effects from opioids such as respiratory depression (obesity, OSA) or constipation/ileus
- Consider when neuraxial is contraindicated (due to anticoagulation, etc.) or patient refuses neuraxial
- Consider when laparoscopic surgery coverts to open surgery

Contraindications

- Allergy to amide local anesthetics
- History of seizures
- Heart block, 2nd or 3rd degree (without pacemaker)
- Heart failure (EF <20%)
- Heart dysarrhythmia (Wolff-Parkinson-White, Adam-Stokes)
- Patient taking amiodarone or class I antiarrhythmics (quinidine, flecinide, procainamide)
- Heart failure patients (EF <20%)
- Severe liver disease
- Severe renal disease (CrCl <30mL/min or ESRD)
- Patient given liposomal bupivacaine (exparel) by surgeon
- Caution in patient taking cytochrome P450 3A4 inhibitors. Consider lower dose or no infusion.
    - –Azole Antifungals (ex. fluconazole, ketoconazole)
    - Protease Inhibitors/HAART medications (ex. atazanavir, indinavir, ritonavir)
    - Macrolide antibiotics (ex. erythromycin, clarithromycin)
    - Certain antibiotics (chloramphenicol)
    - Calcium Channel Blockers (ex. diltiazem, verapamil)
    - Hormonal agents (ex. tamoxifen, estradiol)
    - Grapefruit juice

Dosing

If Starting Lidocaine Intra-operatively:

- 1-1.5mg/kg bolus (use ideal body weight, max bolus of 100mg)
    - Patient must have continuous cardiac, blood pressure, and pulse oximetry monitoring during bolus administration and for additional 15 minutes. Airway and cardiac resuscitative equipment should be available.
- 2mg/kg/hr infusion for 4 hours
- Then 1mg/kg/hr infusion for up to 48 hours from initiation

If Starting Lidocaine Post-operatively:

- 1mg/kg/hr for up to 48 hours
- Bolus dose *not* recommended on the floor due to required monitoring

*Discuss use of local anesthetic administration with surgeon, including liposomal buipvacaine (exparel)

Notify The Acute Pain Service of planned postoperative infusion. A lidocaine infusion also requires an Acute Pain Service consult. The order for consult to pain management must be entered by the primary team in MedConnect.

Local Anesthetic Toxicity

Local anesthetic toxicity symptoms typically occur in a predictable sequence. The therapeutic drug level range for lidocaine is a blood level of 1.5-5 mcg/mL.

- **Mild to Moderate Adverse Effects** *(blood level of 3-5 mcg/mL)*
    - Peri-oral tingling
    - Metallic taste
    - Tinnitus
    - Lightheadedness

    - **Treatment of Mild Side Effects**
        - Stop the infusion
        - Draw lidocaine level (send out lab, results may take up to 3 days)
        - Call Acute Pain Service/Anesthesia to assess the patient and determine if infusion may be restarted

- **Severe Adverse Effects** *(blood level > 5 mcg/mL)*
    - Visual and auditory disturbance *(plasma level 8 mcg/mL)*
    - Muscular twitching
    - CNS effects
        - tonic-clonic seizures *(plasma level 12 mcg/mL)*
        - coma *(plasma level 16 mcg/mL)*
    - Respiratory arrest *(plasma level 20 mcg/mL)*
    - Cardiac effects *(plasma level 24 mcg/mL)*
        - sinus tachycardia, sinus arrest, cardiac arrest

- **Treatment of Severe Local Anesthetic Systemic Toxicity (LAST) (seizures and cardiac arrest)**
  - Stop the infusion
  - Call a code
  - Call Anesthesia and Acute Pain Service
  - Airway management – give 100% oxygen, intubate if indicated
  - Seizure treatment – use benzodiazepines
  - Cardiac arrest and arrhythmias – perform ACLS
  - Give lipid emulsion 20%
    - Bolus 1.5mL/kg
    - Start infusion at 0.25mL/kg/min
    - May repeat up to 2 boluses every 5 minutes for persistent cardiac arrest
    - Increase infusion to 0.5mL/kg/min if low blood pressure continues
    - Stop infusion at least 10 minutes after patient is hemodynamically stable
    - Detailed protocol on www.lipidrescue.com