LIDOCAINE (LIGNOCAINE) – INTRAVENOUS INFUSION FOR HEADACHE

Dosing, Administration and Monitoring Guidelines

Guideline purpose and related documents

To provide guidance on the dosing, administration and monitoring of lidocaine (lignocaine) when administered as an intravenous infusion for chronic daily headaches.

Do not confuse with other protocols or guidelines that utilise lidocaine;

- Lidocaine (lignocaine) - subcutaneous infusion for neuropathic pain guideline
- ICU protocol - lignocaine infusion (for Ventricular Tachycardia/Ventricular Fibrillation cardiac arrest)

Dual-Naming

The Therapeutic Goods Administration has ruled that lignocaine is to be renamed as lidocaine to align with international use. Until 2023 all products will show the dual labelling “lidocaine (lignocaine)”.

Where this guideline mentions “lidocaine” it denotes “lidocaine (lignocaine)”.

Prescribing requirements and restrictions

- Patients should be admitted under the Neurology unit with an anticipated duration of stay ranging between 5 to 10 days
- Bedside cardiac monitoring is required for the duration of lidocaine therapy.
- An infusion pump is required for lidocaine administration.
- A full medical assessment should be performed prior to commencement of the lidocaine infusion.
- ALL headache medication should be ceased as the infusion commences.

Pharmacokinetics and Pharmacodynamics (1,2)

During the first 30 minutes after an intravenous injection, the blood level of lidocaine declines with a half-life of 7-10 minutes due to the rapid distribution to tissues. After this initial phase, the half-life is 90 to 120 minutes. During continuous infusion, steady state is reached after 6 to 8 hours. Lidocaine is metabolised mainly in the liver (90%) and excreted by the kidneys (less than 10% is excreted unchanged).

Indications

- To maintain pain control in patients with chronic daily headaches on maximum analgesic dosages, allowing acute withdrawal of analgesic medications.
- Chronic daily headache includes those patients with transformed migraine, chronic tension-type headache, new daily persistent headache and hemicrania continua
- For the management of analgesic-induced rebound headaches
- For the treatment of prolonged migraine resistant to other therapy

Contraindications

- Cardiac disease including heart block
- Myasthenia gravis
- Allergy/hypersensitivity to lidocaine or other anaesthetics of the amide type

Precautions

- Any form of heart block or sinus bradycardia, cardiac conduction disturbances or severe digitalis intoxication
- Epilepsy
- Renal disease
- Hepatic disease
- Congestive heart failure
- Marked hypoxia
- Severe respiratory depression
- Hypokalaemia
- Pre-existing hypotension (especially if symptomatic)
Dosage and Administration

- 2400 mg (2.4 gram) Lidoaine in 500 mL 0.9% Sodium Chloride, giving a final concentration of 4.8 mg/mL.
  - At this concentration,
    - 1 mL/hr is equivalent to 0.08 mg/minute
    - 25 mL/hr is equivalent to 2 mg/minute
- The intravenous infusion is commenced at 2 mg/minute (25mL/hr - 20 hour infusion) without a loading dose (6,7).
- The infusion should be administered via a peripheral line.
- The infusion rate should remain constant at 2 mg/minute unless otherwise specified by the Neurology unit.
- For administration via Alaris® Care Fusion pump:
  - Select the ‘Lignocaine for headache’ option (located in all the pump profiles)
  - The pump will ask if the 2.4 gram in 500 mL is the correct option: select yes and proceed
  - The pump will prompt a starting rate of 25mL/hr. You will only need to enter the VTBI = 500mL. If the rate is correct then proceed with infusion.
- The infusion should not be stopped or interrupted unless the patient is experiencing significant side effects or there is a specific direction by the Neurology unit to do so.
- Consider reducing the dose in elderly patients and in those with heart failure, liver failure or renal failure.
- IV Incompatibilities: adrenaline (contraindicated in regional anaesthesia), phenytoin (phenytoin and lidocaine have additive cardiac depressant effects), aciclovir, azathioprine, caspofungin, ganciclovir, metoprolol, phenobarbitone, thiopentone(4).

Monitoring

Baseline Observations

- Pain score (on the Adult ORC chart SV 978), heart rate, blood pressure, respiratory rate and 12 lead ECG
- The 12 lead ECG should be repeated 60 minutes after starting the infusion and each morning the infusion is running

Cardiac Monitoring

- Cardiac monitoring should continue for the duration of therapy including during sleep. An ECG rhythm strip should be obtained every 5 minutes for the first 30 minutes of the infusion, then every 15 minutes for 3 hours, and thereafter 2 hourly, including during sleep.
- Pulse and BP should be measured every 5 minutes for the first 30 minutes, then every 15 minutes for 3 hours, and then 2 hourly thereafter while the patient is awake.

Observations

- As postural hypotension may occur in the first days of infusion, patient should rest in bed with toilet privileges and supervision when showering.

Management of Breakthrough Headache

- Pain score should be checked every 2-3hours when awake (at the same time as cardiac monitoring) and recorded on the Adult ORC chart SV 978.
- Rescue medications may include non-steroidal anti-inflammatory drugs (NSAIDs) and paracetamol. Triptans may be used in patients in whom they are not implicated in the rebound headache, and who have previously suffered episodic migraine. (No codeine, opioid or related medication should be used.)
- Consider a PPI (e.g. omeprazole) to prevent or treat NSAID-induced ulcers & GI effects
- Nausea may require treatment with metoclopramide or prochlorperazine.

Discharge strategies

- Patients should be given advice on how to avoid trigger factors and how to manage an acute headache should one develop.
- Patients will usually commence prophylactic headache therapy prior to discharge.

Adverse Effects (1,2,6)

COMMON

- Cardiovascular: bradyarrhythmia, hypotension (3%), postural hypotension
- Dermatologic: injection site pain
- Gastrointestinal: vomiting; diarrhoea (may be associated with codeine withdrawal)
- Musculoskeletal: back pain (3%)
- Neurologic: dizziness, headache (3%), lightheadedness, numbness, paraesthesia, shivering (2%), somnolence, tinnitus
- Ophthalmic: blurred vision, diplopia
- Psychiatric: apprehension, confusion, euphoria, nervousness
SERIOUS
- Cardiovascular: cardiac arrest, cardiac dysrhythmia, heart block
- Haematologic: Methaemoglobinaemia
- Neurologic: loss of consciousness, seizure, tremor

Drug Interactions and Incompatibilities
- Significant interactions: amiodarone, ampnexavir, atazanavir, adrenergic Beta-blockers (e.g. atenolol, metoprolol, propranolol may increase lidocaine serum concentrations with resultant toxicity - additive cardiac depressant effects), cimetidine, dihydroergotamine, fluvoxamine, fosamprenavir, grapefruit juice, hyaluronidase, itraconazole, lopinavir/ritonavir, phenytoin (additive cardiac depressant effects), propofol, St. John’s Wort (hypericum), suxamethonium, saquinavir, telaprevir (1,3).
- Other interactions: cisatracurium, darunavir, etravirine, nitrous oxide, nevirapine (3).

Use in pregnancy and lactation
- Lidocaine is considered safe to use in pregnancy. Maternal use does not appear to be associated with an increased risk of adverse pregnancy outcomes (5).
- Small amounts excreted into breast milk following IV infusion, but it may be used in breastfeeding mothers and is unlikely to pose a risk to the infant (5).

Presentation and Storage
- Lidocaine (Lignocaine) Hydrochloride (Xylocard 500°) 500 mg per 5 mL ampoule
- Store below 25°C at room temperature. Stable for 24 hours once diluted. Protect from light (1, 4).

References
1. Xylocard® Lignocaine hydrochloride Product Information, MIMS® Online, MIMS Australia 2015 [accessed 22/07/15]

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