BCCA Protocol Summary for Extreme Pain Therapy Using Parenteral Lidocaine

Protocol Code

SCPAINLI

Tumour Group

Supportive Care – Pain and Symptoms Control

Contact Physician

VC - Dr Pippa Hawley

CSI - *Dr Gillian Fyles* **LIDOCAINE** is an amide local anesthetic that is a non selective sodium channel blocker given with the intent of relieving chronic neuropathic pain. Injured nerves develop abnormal, spontaneous active sodium channels at the site of nerve injury and along the nerve pathway. In low doses, Lidocaine can suppress this abnormal firing at concentrations that do not affect normal nerve or cardiac function. Lidocaine is rapidly metabolized in the liver and the metabolites are excreted by the kidneys. Dose adjustments may be required in the case of liver and/or renal insufficiency. Lidocaine can also have a negative inotropic effect and should be used with caution when there is a history of cardiac failure.

ELIGIBILITY

- Patients with diagnosis of severe pain syndrome inadequately responsive to standard therapies.
- Patients with particularly severe neuropathic pain requiring acute therapy to diminish pain with the understanding that other less invasive medications will be administered to provide ongoing pain relief.

EXCLUSIONS

- Patients must be adequately cognitively intact to report pain intensity and adverse effects.
- Prior allergy to local anaesthetics
- Liver failure (Bilirubin greater than or equal to 25 micromol/L)
- Severe cardiac failure or second/third degree heart block
- Uncontrolled seizures
- Hypertension (BP greater than 160 mm Hg systolic)
- Hypokalemia

TESTS

- For first treatment: if patient is male over 65 yrs/female over 55 yrs and/or known or suspected of having cardiac problems, EKG must be done within 14 days of procedure
- Bloodwork: Potassium, Creatinine, BUN, LFT
- During each treatment: blood pressure and heart rate and pain level every 15 minutes during infusion plus every 15 minutes x 2 post end of infusion.
- If clinically indicated: Repeat EKG, serum potassium, liver function tests, bilirubin.
- Rule out previous allergy to amide type local anesthetic.

PREMEDICATIONS

None

TREATMENT for ADULTS

Drug	Dose	BCCA Administration Guideline
Lidocaine	Intermittent Dose First dose: 5 – 10 mg/kg (maximum single dose of 900 mg)	IV in 100 ml* D5W if dose less than 250 mg or 500 ml D5W if dose greater than 250 mg over 60 to 120 min
Lidocaine	Intermittent Dose Subsequent doses**: 5 - 10 mg/kg	IV in 100 ml* D5W if dose less than 250 mg or 500 ml D5W if dose greater than 250 mg over 60 min to 120 min
Lidocaine levels:		Lidocaine blood levels are not required routinely, but may be ordered at any time if there are concerns about toxicity, for example if a client is expected to be asleep whilst on prolonged infusion. For continuous infusions, levels should be drawn 8-12 hours after initiation or any change of dosage. ⁽¹⁰⁾

* Final concentration should be 1 to 4 mg/ml

** Subsequent doses will be determined by clinical effect and evidence of toxicity

 Repeat as per patient's need (up to every 30 days). Discontinue if no response or toxicity occurs.

DOSE MODIFICATIONS

- 1. Hematological: None
- 2. **Renal dysfunction**: Titrate to effect and toxicity.
- 3. Hepatic dysfunction: Use with caution and titrate to effect and toxicity.
- 4. **Drug Interactions**: Cimetidine or beta-blockers may increase lidocaine serum concentrations. Phenytoin may stimulate the hepatic metabolism of lidocaine.

PRECAUTIONS

1. **CNS Effects**: Adverse reactions to lidocaine usually involve CNS effects, and are dose related.

Lower concentration Early warning signs include ringing in ears, metallic taste, lighheadedness, perioral numbness or tingling and headache.

Higher concentration (lidocaine level near 21 umol/L) CNS disturbances: feelings of disassociation, paresthesias, mild drowsiness, or mild agitation, nausea/vomiting.

Highest concentrations (lidocaine level greater than 21 umol/L) CNS disturbances: decreased hearing, tinnitus, disorientation, blurry vision, muscle twitching, convulsions, or respiratory arrest.

When they occur, stop the infusion and contact physician. Infusion may be restarted at lower rate after resolution of symptoms as per physician's orders. Lorazepam for seizures may be ordered.⁽¹¹⁾

Unrest, tremor and facial twitching are warning signs of impending generalized convulsions.

Perspiration, dyspnea, and short intervals of apnea are warning signs of impending respiratory arrest.

- 2. **Cardiovascular Effects**: Reactions are rare with lidocaine and are usually related to high serum levels of lidocaine; they may be the first manifestations of toxicity. Myocardial depression or bradycardia (at high therapeutic plasma levels). Physician to specify lowest heart rate (HR). Atropine for bradycardia may be ordered.⁽¹¹⁾ Although lidocaine after myocardial infarction has been associated with a trend towards increased risk of arrhythmias, cardiac monitoring during studies of normal patients have noted no major cardiovascular toxicity at clinically appropriate levels.
- 3. **Gradual Increasing Blood Pressure**If blood pressure changes over 3 consecutive readings by plus or minus 10 mmHg <u>or</u> is greater than systolic 160 mmHg stop the infusion and contact physician. Infusion may be restarted at lower rate after resolution of symptoms, as per physician's orders. At low plasma concentrations, high blood pressure may be observed, and as the plasma concentrations increase, the blood pressure may decrease. Physician to specify lowest and highest systolic blood pressure (SBP). Captopril for hypertension may be ordered. ⁽¹¹⁾
- 4. **Respiratory Toxicity** Perspiration, dyspnea, and short intervals of apnea are warning signs of impending respiratory arrest. Stop infusion, contact physician and administer oxygen.⁽¹⁰⁾ Recent studies indicate that IV lidocaine may potentate a bronchospasm and cause airway narrowing in asthmatics.⁽⁴⁾

SIDE EFFECTS

- 1. **Early signs of toxicity:** drowsiness, perioral numbness, ringing in ears, metallic taste, tingling mouth, light headedness, nausea, headache or increased blood pressure.
- 2. Later signs of toxicity: Signs of lidocaine toxicity include muscle twitching, convulsions, tinnitus, perioral numbness, drowsiness, metallic taste, somnolence, respiratory depression, dizziness, confusion, feelings of disassociation, blurred vision, double vision, visual hallucinations, bradycardia greater than 20%, hypotension greater than 20% and agitation. Hypertension can be an early warning sign of toxicity, followed by hypotension. ⁽⁸⁾

3. For questions regarding this treatment program call: VCC: Dr. Pippa Hawley (pager 604-667-1135) at (604) 877-6000 or 1-800-663-3333 CSI: Dr. Gillian Fyles (pager 250-712-1802) at 250-712-3900 or 1 888-563-7773.

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