Subcutaneous Lidocaine Infusion for Chronic Pain: The LIDO-CHRON Study
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Introduction
Lidocaine is a local anesthetic that blocks peripheral and central sodium channels including those in the spinal dorsal horn. Lidocaine is considered a therapeutic option for neuropathic pain unresponsive to usual therapies; IV lidocaine has been shown to be superior to placebo for treating predominantly neuropathic pain.

The Vancouver Island Health Authority Regional Pain Program has a number of patients with difficult to treat chronic pain who receive intermittent subcutaneous infusions of lidocaine. No studies have been published on the use of intermittent subcutaneous lidocaine for the treatment of chronic pain.

We set out to estimate the extent and duration of pain relief in patients receiving subcutaneous lidocaine in our Nanaimo pain clinic.

Objectives
Primary Objective:
- Estimate the extent and duration of benefit for pain intensity that chronic pain patients experience from intermittent subcutaneous infusions of lidocaine using a numerical rating scale (NRS) from 0 – 10

Secondary Objectives:
- Estimate the extent and duration of benefit that chronic pain patients experience from intermittent subcutaneous infusions of lidocaine using:
  - Patient’s impression of change in pain
  - Breakthrough medication (PRN) use as a marker of increasing pain
  - Self-reports of global change in function
  - Describe the occurrence and rate of adverse effects from subcutaneous lidocaine infusion

Methods
Design: Single center
- Observational
- Chart review and prospective survey
  - At baseline and daily for the dosing interval of 14 or 21 days
  - Either online or paper-based

Inclusion Criteria
- All patients ≥18 years of age receiving intermittent subcutaneous infusions of lidocaine for chronic pain
  - Dose of 15 mg/kg lidocaine 2% solution
  - Administered at 2 or 5 mL/hour using elastomeric infusion pump (Baxter Infuser)
  - Infused into the subcutaneous tissue of the abdomen or upper arm
  - Infusion started by nursing staff at an ambulatory pain clinic
  - Infusion removed at home by patient once complete (approximately 6 to 18 hours)

- Received lidocaine between Jan 7 2011 and Feb 11 2011 at the Vancouver Island Health Authority Regional Pain Program at the Nanaimo Regional General Hospital

Exclusion Criteria
- Receiving subcutaneous lidocaine infusions for an indication other than chronic pain
  - Not able to read/write in English
  - Does not have computer access/computer skills necessary to complete an online survey and does not wish to complete a paper survey
  - Unwilling/unable to provide written informed consent

Results

Discussion
Mean Pain Intensity (Numerical Rating Scale 0–10)
- Prior to lidocaine: 6.4 (standard deviation 2.1)
- On day 1: reduced by 1.6 (95% confidence interval 0.8–2.2)
- Greatest reduction on day 8 (2.2; 95% confidence interval 1.2–2.9)

Clinically Meaningful Pain Reduction
- May require a change of 30% or approximately 2 points
- Day 1: 72% of patients reported an improvement in pain
  - Between days 7 and 13 this was reduced from 70% to 29% of patients

Use of Breakthrough Medication for Pain
- Number of patients using breakthrough mediation increases after day 8
- Reduction in the number of pills used per patient was no longer statistically significant after day 12

Activity
- The percentage of patients reporting “better than normal” ability to perform activities increased from 23% to 55% after receiving lidocaine
- By day 11 levels were similar to baseline

Adverse Effects
- Common; reported by 66% of patients 24 hours after receiving lidocaine
- Most were resolved by day 4

Study Limitations
- Small sample size
- Open label
- No control group
- Responses on paper-based survey may be completed on the wrong date
- Responses may be influenced by history of concern for withdrawal of funding for lidocaine therapy

Conclusions
Subcutaneous infusions of lidocaine appear to provide a mean reduction of pain intensity of up to 2.2 points (NRS from 0–10) in patients with chronic pain (predominantly neuropathic in origin).

Initial improvements in pain intensity, use of breakthrough pain medications and the ability to perform activities start to diminish for many patients between days 8 and 14.

Subcutaneous lidocaine for chronic pain merits further investigation. Future studies should aim to control for placebo effects, compare lidocaine doses and intervals and determine which pain conditions are most likely to benefit from lidocaine therapy.

References available on request - Kyle.Grieve@viha.ca