New Oral Analgesic Formulation for Control of Pain in Dogs

Published date: Oct. 16, 2017

Technology description

Description: Researchers within the College of Veterinary Medicine at Kansas State University have discovered that the repurposing of two human approved drugs if administered orally to dogs provides a long acting opioid effect that can be used for the control of mild to severe acute and chronic pain.

The options for treating moderate to severe pain in dogs on an outpatient basis are very limited. Nonsteroidal anti-inflammatory drugs have limited efficacy for mild to moderate pain and can have adverse side effects including gastrointestinal ulcerations and perforations, renal failure and death. Injectable opioids are frequently used for inpatients, but are short acting (2-6 hours duration) and are not practical for most outpatients. Additionally, sending home injectable opioids with clients presents a risk for inadvertent drug exposure, misuse, and diversion. Opioids administered orally to dogs do not work because the drugs are rapidly metabolized in the dog’ s body before analgesia can take effect. A FDA approved fentanyl transdermal solution for use in dogs was recently discontinued by the manufacturer and is no longer available.

Through several studies analyzing different drug combinations, Dr. KuKanich and his team discovered that if you combine oral methadone with a frequently used antifungal drug, fluconazole (at a very low dose), it increases oral bioavailability and opioid duration in dogs. Fluconazole acts as a drug inhibitor of a specific liver enzyme allowing methadone to remain active in the body longer. Methadone plus fluconazole administered orally produced clinical opioid effects for 12 hours in dogs and twice daily dosing will allow for excellent dosing compliance for both inpatients and outpatients.

These two drugs are relatively inexpensive and can be formulated together into a tablet, capsule or an oral suspension for ease of use. **An inexpensive opioid antagonist could be included in the formulation to avoid intentional misuse and diversion by pet owners.** This new technology could provide veterinarians and dog owners with a new option to treat acute pain after surgery or trauma and chronic pain at home. It could also provide clinics with a new option when pain relief for 12 hours is desirable, such as overnight.

Figure 1:

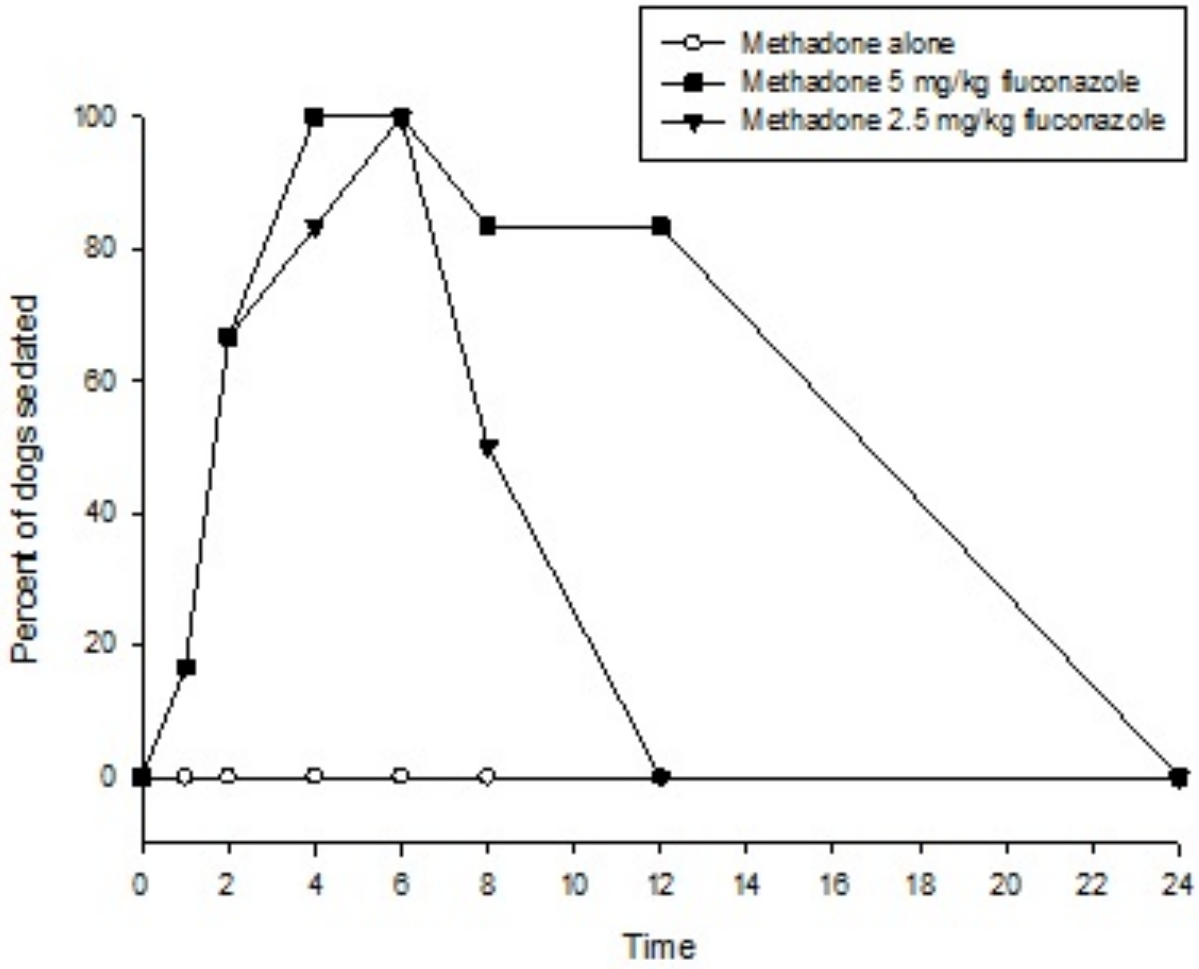
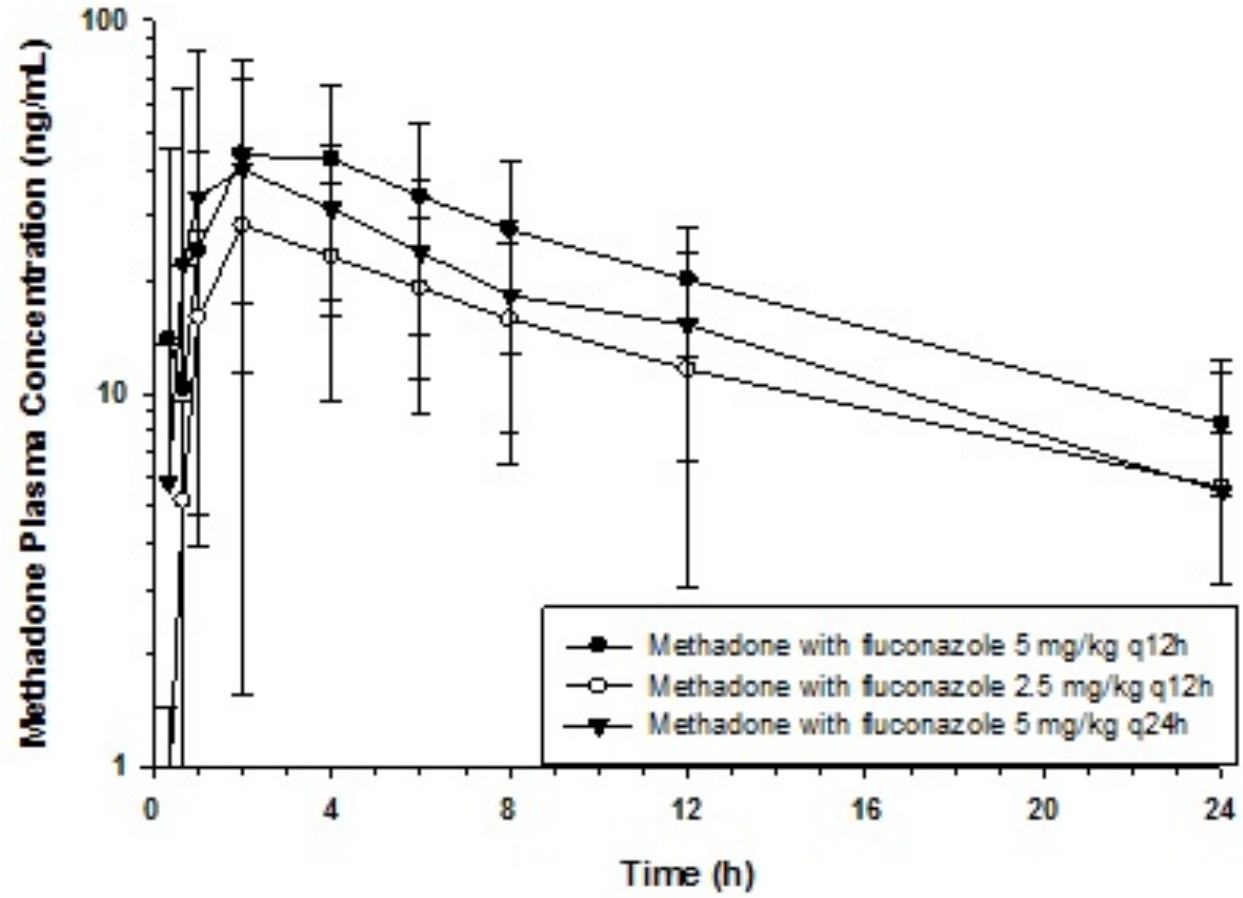


Figure 2:



Application area

New oral analgesic product for pain relief in dogs

Figure 1. Sedation after administration of methadone alone, methadone 24 hr after fluconazole 5 mg/kg PO q 12h and methadone 24 hr after fluconazole 2.5 mg/kg PO q 12h.

Figure 2. Plasma methadone concentrations (mean ± SD) in 6 dogs/treatment administered fluconazole 2.5 or 5 mg/kg PO q 12h with methadone 1 mg/kg administered 24 hours after fluconazole or fluconazole 5 mg/kg PO q24h with methadone 1 mg/kg administered 12 hours after fluconazole.

Advantages

Long-acting oral pain relief

Inexpensive

Easy to administer for dog owners

Institution

Kansas State University

Inventors

David Rankin
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Charles Locuson