Evaluation of meloxicam and EMLA® for pain mitigation in piglets undergoing surgical castration

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BACKGROUND

In North America, commercial boars undergo surgical castration to prevent boar taint and to minimize aggression. While castration is known to be a painful procedure, piglets do not currently receive analgesic or anesthetic for pain management. Analgesia recommendations for boar piglet castration have been developed in the EU, but doses of drugs, such as meloxicam, have been extrapolated from sows and growing pigs and have had limited efficacy when administered to piglets.

OBJECTIVES

• To determine if piglets given an analgesic (meloxicam) prior to castration demonstrate reduced pain behaviours
• To determine if piglets given a topical anesthetic (EMLA®) prior to castration demonstrate reduced pain behaviours

METHODS

Boar piglets from 4 litters were used for this study (n=19). Boars were randomly assigned to one of five possible treatments across litters: 1. Meloxicam + EMLA® 2. Meloxicam + unmedicated cream 3. Saline + EMLA® 4. Saline + unmedicated cream 5. No treatment

Symbols were allocated to each treatment group and marked on the forehead and back of piglets. Animals were castrated (~5 days old) by an experienced animal technician.

Piglets were videotaped at 24h pre-procedure for 1h, from 0-7h post-castration and at 24h post-castration for 1h. Behavioural scoring of piglets was conducted by an individual blinded to animal treatment using a detailed ethogram (Table 1) and Observer XT software. Behaviour was scored continuously for the first 15 minutes at: -24, 0, 1, 2, 3, 4, 5, 6, 7, and 24h post-castration.

Piglet behaviours were analyzed individually for a treatment, time or litter effect and then grouped into active and inactive behaviours for further analysis.

METHODS

Evaluation of a variety of topical anesthetics for boar piglets undergoing castration and boar/gilt piglets undergoing tail docking

RESULTS

The total duration of piglet behaviours was converted into proportions prior to analysis to account for periods of time when the piglet was not in view and unable to be scored. No effect of litter was noted after analysis and data was combined across litters.

Piglets demonstrated significant behavioural changes, when compared to baseline behaviours, up to 7 hours post-castration (for most behaviours, p<0.0001). There was no difference in behaviour at -24h and 24h post castration for any treatment group. None of the analgesic or anesthetic treatments were able to significantly reduce pain behaviours (see Table 2 for summary).

RESULTS

• Castration causes significant pain to piglets, lasting up to 7h post-procedure (demonstrated by the reduction in active behaviours and increase in castration-related pain behaviours)
• Treatment of piglets with 0.4mg/kg meloxicam IM and/or topical EMLA® cream 30 minutes prior to castration does not provide sufficient analgesia or anesthesia to mitigate these effects
• Piglets may require a higher dose of meloxicam than what is currently being recommended (0.4mg/kg)

SIGNIFICANCE

FUTURE WORK

• Pharmacokinetic trial with 1mg/kg meloxicam
• Evaluation of a variety of topical anesthetics for boar piglets undergoing castration and boar/gilt piglets undergoing tail docking
• Evaluation of two analgesics (meloxicam at 1mg/kg and ketoprofen at 6mg/kg) for pain relief in piglets undergoing tail docking or castration

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LITERATURE CITED


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