Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Federal Department of Home Affairs FDHA

**Federal Food Safety and
Veterinary Office FSVO**
Research Management

Tierschutz   **Betäubung**

Optimierung der Injektions- bzw der Inhalationsanästhesie zur Kastration von Ferkeln

Regula Bettschart-Wolfensberger[1], Iwan Nussbaumer[2]
[1]Section Anaesthesiology, Equine Department, Vetsuisse Faculty, University of Zurich, CH-8057 Zürich, [2]Vital AG, CH-5036 Oberentfelden

Key words
Piglet castration, anaesthesia, isoflurane, local anaesthesia

Aim of the study
This study was divided in two parts.
Part 1 aimed at testing if perioperative analgesia for castration of piglets under inhalation anaesthesia can be improved with preoperative butorphanol or intratesticular lidocaine.
Part 2 aimed at establishing injectable anaesthesia for piglets (age 3-4 or 5-6 weeks) resulting in no reaction to surgical stimulation during castration and smooth, complete recoveries within 2 hours of its administration.

Material and methods
Part 1: 66 piglets were castrated under 1.8% endtidal isoflurane and randomly received 0.2 mg/kg butorphanol and/or 0.4 mg/kg ~~Metacam~~ Meloxicam IM ~~or~~ both 20 min before castration, or during anaesthesia 0.4 mg/kg meloxicam IM together with 4 or 8 mg/kg lidocaine 2% intratesticularly (group ML4 and ML8). Intraoperative depth of anaesthesia was scored (blinded) and cardiopulmonary function assessed.
Part 2: By means of a previously established dose rate decision tree, various dose rate combinations of ketamine, azaperone and romifidine were tested first in 3-4 and then in 5-6 week old piglets. Onset, depth and duration of anaesthesia were scored as well as recovery.

Results and significance
In part 1 it was discovered that butorphanol led to excitations. Its use was discontinued and the remaining piglets were castrated with local anaesthesia or meloxicam only. With only meloxicam a higher incidence of movements (11/17) than in group ML4 (3/18) and ML8 (4/17) was recorded. The number and the intensity of movements with meloxicam only were also significantly higher. No differences in cardiopulmonary function between the groups occurred.
In part 2 in both age groups with doses rates of 10-20 mg/kg ketamine, 3-4 mg/kg azaperone and 0.15-0.20 mg/kg romifidine either depth of anaesthesia was insufficient and/or recovery was stormy or prolonged.

Publications, posters and presentations
Cap, V.H.; Hug, P.J.; Echtermann, T.; Von Ah, S.; Nussbaumer, I.; Bettschart-Wolfensberger R. Evaluation of different dose rate combinations of ketamine, romifidine and azaperone for castration of 3-4 and 5-6 weeks old piglets (Submitted to SAT)
Cap, V.H.; Abass Mossa, M.; Hug, P.J.; Kümmerlen, D.; Hug, C.; Bettschart-Wolfensberger, R. Butorphanol induces anxiety-like behaviour and distress in piglets (In preparation)
Hug, P.J.; Cap, V.; Honegger, J.; Schüpbach-Regula, G.; Schwarz, A.; Bettschart-Wolfensberger, R. Optimization of castration under inhalation anaesthesia with isoflurane using parenteral butorphanol, meloxicam or intratesticular lidocaine in 7-14 days old piglets (In preparation)

Cap, V.H; Hug, P.J.; Echtermann, T.; Von Ah, S.; Nussbaumer, I.; Bettschart-Wolfensberger, R. Evaluation of different dose rate combinations of ketamine, romifidine and azaperone for castration of 3-4 and 5-6 weeks old piglets (accepted to be presented at the 9th European Symposium of porcine health management, 3.-5. May 2017, Prag)

Cap, V.H.; Abass Mossa, M.; Hug, P.J.; Kümmerlen, D.; Hug, C.; Bettschart-Wolfensberger, R. Butorphanol induces anxiety-like behaviour and distress in piglets (Poster) (accepted to be presented at the 9th European Symposium of porcine health management, 3.-5. May 2017, Prag)

Hug, P.J.; Cap, V.; Honegger, J.; Schüpbach-Regula, G; Schwarz, A.; Bettschart-Wolfensberger, R. Optimization of castration under inhalation anaesthesia with isoflurane using parenteral butorphanol, meloxicam or intratesticular lidocaine in 7-14 days old piglets (oral presentation) (accepted to be presented at the 9th European Symposium of porcine health management, 3.-5. May 2017, Prag)

Project 2.16.08

Project duration February 2016 – February 2017