Oral administration of an anti-inflammatory drug does not compromise the efficacy of intratesticular injection of zinc gluconate as a contraceptive for dogs

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Introduction

We have demonstrated the potential of a single intratesticular injection of a zinc gluconate solution (Testoblock; Biorelease Technologies, LLC, Birmingham, AL) as an irreversible contraceptive for male dogs. The results reported in a six-month study revealed that dogs were azoospermic 60 days after injection and histological and ultrastructural changes suggested irreversibility. Recently, we observed that some dogs presented discomfort after the procedure and others reported the same situation after using a similar drug in male dogs. In this study, an oral analgesic with anti-inflammatory action was administered for two days. One of the mechanisms of action of zinc when injected into the testis is the disruption of the Sertoli cell barrier and induction of a local immune and inflammatory response that causes cellular alteration and interruption of spermatogenesis. Therefore, the use of an anti-inflammatory drug could affect this mechanism of action of zinc gluconate and compromise the efficacy of the chemical sterilization procedure.

Aim

The aim of this study was to examine whether the efficacy of zinc gluconate as a chemical sterilant would be compromised in the presence of an anti-inflammatory/analgesic agent, sodium dipyrone.

Methods

Ten sexually-mature mongrel dogs were assigned to 2 groups, a control group (n=5) and a treated group (n=5), and into each testis a single injection of zinc gluconate solution was administered. The treated group received sodium dipyrone (25mg/kg, TID, PO) that was administered after the procedure for two days. Zinc gluconate solution was injected at six different doses (0.2 to 1.0mL) based on testicular width (10 to 27mm). General attitude, ability to walk, scrotal alteration (pain, swelling, dermatitis), rectal temperature, semen analysis, hematology, and renal and hepatic function were performed on day 0 after injection and every two months for one year.

Results and discussion

No biting/licking was recorded after the injection in all animals. Transient testicular swelling was reported in both control and treated animals during the first three days after injection. Dogs that vocalized or did not want to eat after the procedure received dipyrone for two days and normal behavior was observed following treatment. At 60 days post-injection, all animals were azoospermic and this condition was observed until the end of experiment. There were no significant differences between treated and control groups for the clinical parameters evaluated and values for the parameters were within normal ranges for domestic dogs. Sodium dipyrone is a well-known non-steroidal anti-inflammatory drug used for acute and chronic pain. Beyond its analgesic importance dipyrone has anti-inflammatory properties that are only secondary to its main action. Therefore, this secondary function may not have affected the mechanism of action of zinc gluconate.

Conclusion

The administration of an analgesic drug (sodium dipyrone) after chemical castration of dogs using an intratesticular injection of a zinc-based solution does not compromise the efficacy of the procedure and contributes to animal welfare.

Keywords: Chemical castration, dog, sodium dipyrone, testis, zinc
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