ABSTRACTS

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Effects of two intratesticular injections of a zinc gluconate-dimethyl sulfoxide solution for chemical sterilization of dogs

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OBJECTIVES AND METHODS: Canine population control is an important issue for public health and animal welfare. Chemical neutering is an option to orchectomy for practical reasons and low cost. The aim of this study was to evaluate the andrological and clinical effects of a double intratesticular injection of a zinc gluconate solution. For that purpose, intact male dogs aged from 1 to 6 years, body weight ranging from 10 to 20 kg, were selected through a sequential four breeding soundness exams and two testicular ultrasound analysis. Dogs were randomly allocated into two groups: Control (C; n=7) and Treatment (T; n=15), submitted to two intratesticular injections on a monthly basis of 1.0 mL isotonic saline (NaCl 0.9%), or zinc gluconate (26.2 mg/mL) – dimethyl sulfoxide solution (Infertile®-Brazil), respectively. Every two weeks during 5 months general and specific clinical exams were proceeded: semen collection and evaluation (volume, sperm motility, forward progressive velocity, sperm concentration, sperm morphology through Spermac® stain and buffered formol saline technique, sperm membrane status by Eosin–Nigrosin staining) and libido evaluation (arbitrary scale from 0 to 3). Once a month, males were subjected to testicular and epididymal ultrasound (Piemedical 200, 7.5 MHz) and blood collection for testosterone immunoassay (Coat-A-Count®). After the experimental period, testicles were surgically removed and fixed in 10% formalin. Testicular fragments were stained with haematoxylin and eosine and histologically evaluated for tissue lesions (scale from 0 to 3). Data were analyzed using ANOVA and Tukey’s Test at p < 0.05. The study was approved by the Bioethics Committee of the Faculty of Veterinary Medicine - USP.

RESULTS: All physical exam variables were within normal limits throughout the experimental period. After injections, there were no signs of discomfort or testicular pain. Concerning testicular palpation, 87% of treated animals showed consistency alterations and 41% had an increase in volume after first injection, followed by a significant reduction on testicular dimension by the end of the experiment. Testicular ultrasound revealed significantly more severe echotexture, architecture and echogenicity changes in T group. A significant reduction in libido was verified in 60% of treated animals, especially after second injection. Only 26.7% of T group dogs presented azoospermia or aspermia, whereas the totality of males subjected to treatment showed statistical reduction in volume (C:81.94mL ± 0.12; T: 1.56mL ± 0.), sperm concentration (C:451 million/mL ± 51; T:169 million/mL ± 19), forward progressive velocity (C:3.35 ± 0.122; T:0.2 ± 0.1), sperm motility (C:75.2% ± 1.99; T:48.88% ± 2.22), membrane integrity (C:85.9% ± 1.77; T:66.65% ± 2.57), as well as increase in sperm defects (C:14.41% ± 1.42; T:24.05% ± 1.4) until the last week trial. Histopathological analysis indicated grade 2 lesions in a major proportion of the T group, represented by partial to total damage of testicular parenchyma and areas of dystrophic calcification. There were also histopathological signs of general testicular degeneration and tubular macrophage infiltration (chronic inflammation) in males submitted to treatment. Regarding serum testosterone assay, no statistical difference was verified between groups during the experimental period. It was verified a positive correlation between libido and sperm analysis variables, except for spermatozoa defects, as well as with testicular biometry.

CONCLUSION: The proposed treatment promoted a significant decrease in sperm quality, promoting asthenospermia, oligospermia and teratospermia, but it was not able to completely sterilize all animals within 5 months after the first injection. These results are similar to those obtained previously with a single injection of the same zinc gluconate solution (1). Nevertheless, it induced irreversible testicular parenchyma damage with a continuous inflammation process occurring over time. On the other hand, testicular steroidogenesis was maintained, despite the decreased sexual interest and libido verified in treated males.