

EFFECTS OF PREGNANCY ON COMPLETE BLOOD CELL COUNTS AND SERUM BIOCHEMICAL PROFILES IN DOGS

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In humans, the hematological and biochemical changes occurring during pregnancy have been well studied with the most notable changes being anemia and a two-to-three-fold increase in serum alkaline phosphatase, exceeding normal concentrations. Canine gestational changes have not been well documented, precluding proper interpretation of blood parameters in illness that may arise during pregnancy. Weekly blood samples were obtained from 10 pregnant bitches from the first day of breeding until parturition. Complete blood cell counts, including reticulocyte counts, and serum biochemical parameters, including serum iron concentrations, were performed and the data statistically evaluated using the Student's *t*-test. Trends were similar to those of humans but less dramatic. In humans, the average increase in blood volume is 45–50%, while in the dog the increase was estimated to be only 25–30%. The mean red blood cell count and packed cell volume dropped slightly below normal adult values during the last 1–2 weeks of pregnancy. Platelets doubled during the second half of pregnancy significantly exceeding the upper normal limits by up to 43% during the last 2 weeks. All other hematological parameters remained within normal limits. While never exceeding normal, there was an increase in white blood cell counts attributable to increased neutrophils. Despite decreases in most serum biochemical parameters, all remained within normal ranges. Serum biochemical concentrations remained within normal limits even when adjusted to account for hemodilution. In summary, hematological and serum biochemical profiles in pregnant bitches do not differ significantly from those found in normal adult dogs. Therefore, pregnant bitches presenting with abnormal parameters should be examined for other, concurrent disease.

Keywords: Pregnancy; Canine; Hematology; Serum biochemistry

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SPERMATOCRIT AS A MEASURE OF CONCENTRATION OF SPERMATOZOA IN THE CANINE EJACULATE

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Semen was collected from 44 dogs by manual ejaculation. Aliquots were created containing known concentrations of spermatozoa, determined using a standard hemacytometer technique. Spermatocrits were performed by filling hematocrit tubes with internal diameter (i.d.) 0.53 or 1.1–1.2 mm, centrifuging for 1 min, and assessing percentage of solids. A standard scale was created, described by the equation [concentration (millions/ml) = (51.69)(% solids) – 47.43] for tubes with i.d. 0.53 mm, and [concentration (millions/ml) = (113.1)(% solids) – 262.6] for tubes with i.d. 1.1–1.2 mm. Concentration of spermatozoa in 33 samples was evaluated by a standard hemacytometer technique. Spermatocrits were performed and concentrations determined mathematically. Values determined by spermatocrit were compared with those determined with the hemacytometer by ANOVA and determined to be significantly different, with $p < 0.001$ for both sizes of hematocrit tube. Correlation coefficient comparing concentrations determined with a hemacytometer and spermatocrit using tubes with i.d. 0.53 mm was 0.75; correlation coefficient comparing concentrations determined with a hemacytometer and spermatocrit using tubes with i.d. 1.1–1.2 mm was 0.43. Spermatocrit is not an accurate measure of concentration of spermatozoa for dogs.

Keywords: Spermatozoa; Concentration; Semen evaluation; Canine

LONG TERM (>2 YEARS), REVERSIBLE, AND SIDE EFFECT-FREE CONTRACEPTION WITH A CO-EXTRUDED SILASTIC-BASED PROGESTIN IMPLANT IN DOGS AND CATS: AN EFFICIENT ALTERNATIVE TO IMMUNOCONTRACEPTION

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Many technologies have been explored and proposed for development of a long acting, non-surgical contraceptive for dogs and cats. This approach should not be expensive to allow the widest use possible. It should be

easy to administer, reversible to allow the owner to change his or her mind or to better organize and control reproduction of his or her pet. Particularly important was that it should be devoid of significant side effects. Our goal was to develop a device responding to these requirements and by using available technologies to reduce development costs.

The development of these implants was realized in four different phases:

(1) *in vivo* determination of the minimum effective progestin dose (MED) to control estrus cycles in dogs and cats; (2) definition of a prototype formulation—*in vitro* and *in vivo* releases; (3) clinical validation trials; (4) *in vitro* optimization of the implant and *in vivo* efficacy and tolerance studies.

After 4 years of development, we produced a 2 years contraceptive implant, effective both in dogs and cats and devoid of significant side effects during a 4 years follow-up study. Its contraceptive effects were reversible. The cat implant is ± 2 cm long and 0.24 cm of diameter; the implants for dogs are ± 4 cm long and 0.32 cm diameter. The implant is not associated with any local or general reactions, and, it is easily detected by radiography, allowing its removal when reversibility is needed.

Based on these results, we conclude that progestins administered consistently at low dose still are a viable option for contraception in dogs and cats. This approach also helps to better understand the mode of action of progestins and certainly lead to a new perspective for the use of these agents in pets. This allows us to reconsider the use of older drugs with new perspectives.

Keywords: Dog; Cat; Contraceptive implant; Clinical trial

EVALUATION OF THE “MINITUBE SPERMVISION COMPUTER-BASED AUTOMATED SYSTEM” FOR DOG SEMEN ANALYSIS

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An objective evaluation of semen is required to assess the canine fertility and to select appropriate techniques for semen preservation. With conventional microscopic evaluation, the subjectivity of the analysis results in significant variability. In the present study, we validated the Minitube SpermVision Computer Based-Automated System for objective assessment of canine semen. A description of the fertile canine motility parameters using this analyzer is reported. The repeatability

between fields is automatically controlled by the system, which does not allow a variation of more than 20% in the evaluation of any single sample to allow for reliability of the results. The SpermVision is effective over a large range of concentration without major significant differences; however, based on the concentration studies realized, it clearly appears that the ideal range for measurement is probably between 50 and 100 million sperm cells/ml. Highly concentrated semen should then be diluted to fit in this optimum range, if the concentration is lower, variability per field can be too important, if the concentration is too high the effects of sperm cells superposition and sperm collision decrease the reliability of the analyses. The setting up of the system is easy and can rapidly be adapted to any species of interest. The major factor impacting the sperm cell recognition is the light intensity which should ideally check and set up before every analysis. The validity of the measurement over time has been determined with semen preserved at two temperature 20 and 38 °C before analyses at 38 °C. Semen analysis at 20 °C appears to allow for better and longer preservation of non-diluted semen during viability studies reducing significantly semen agglutination observed over time. The makler chamber gave similar results as the leja cell which both were adapted to dog semen evaluation whereas the cell-vu which induced a decrease of all sperm motility parameter was considered as inadapted. Generated from the analysis of six mature fertile Anatolian Shepherd Dogs and pools of semen, the SpermVision analyzer represents a useful tool for andrological studies in dogs.

Keywords: Canine semen; CASA; motility parameters

Equine

UTERINE INFLAMMATORY RESPONSE TO FROZEN SEMEN, *STREPTOCOCCUS EQUI* SUBSPECIES *ZOOEPIDEMICUS*, OR BOTH AT 72 h POST-TREATMENT IN YOUNG, REPRODUCTIVELY SOUND MARES

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In vivo, bacteria and spermatozoa are simultaneously present or introduced into the mare's uterus at breeding, however there is little information on the combined