Oral alpha lipoic acid as a prophylactic agent to prevent canine diabetic cataract: preliminary results of a placebo-controlled study

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We have previously shown that the aldose reductase inhibitor alpha lipoic acid (ALA) together with a number of plant antioxidants in a oral formulation (OcuGLO™, Animal Necessities, Jupiter Florida USA) is effective at preventing diabetic cataract in the dog. Other workers have reported that a different aldose reductase inhibitor in a topical drop formulation, Kinostat, given three times daily, similarly prevents the formation of canine diabetic cataract. Here we aim to evaluate alpha lipoic acid alone as an oral prophylactic treatment to prevent diabetic cataract in a randomised placebo controlled study.

Diabetic dogs were examined with direct and indirect ophthalmoscopy and slit lamp biomicroscopy. Those with lenses which had not progressed to blinding cataract were randomised into treatment and placebo groups and given either oral ALA at 2.5 mg/kg daily or a placebo. The end point was determined to be a change in degree of lens opacity at which time the treatment would be deemed to have failed.

20 dogs were included in the study, 10 on the ALA arm of the trial and 10 on the placebo. The time to development of lens opacification in the dogs given placebo was 129±31 days while the time to development of cataract in the ALA-treated animals was 225±46 days, this difference in time to lens opacification between the two arms of the study being significant at $p<0.001$. 4 of the 10 dogs on the ALA arm of the trial developed significant cataract, while 7 of the 10 dogs on the placebo arm developed significant cataract.

This study shows that oral ALA alone can retard cataract formation in diabetic dogs, although it is unable to stop lens opacification completely in all dogs. While it is difficult to compare the results of this study with those of the OcuGLO and Kinostat trials already completed, it would appear that while cheaper and more readily available in the UK than either OcuGLO or Kinostat, ALA alone does not appear to be as effective in preventing diabetic cataract formation, since not all animals on the treatment remained cataract-free. The trial is ongoing to provide further information on the longer-term effects of ALA in diabetic canine eyes.

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Topical and systemic steroid medications increase intraocular pressure in dogs

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It is widely accepted in human patients that corticosteroids, administered topically or systemically can increase intraocular pressure (iop) to the point of eliciting glaucoma. This has been demonstrated in a number of animal species but research into the influence of steroid on iop in the dog is currently very limited. Here we measured the iop in dogs given topical or systemic steroid and compared the values to those in a group of normal dogs.

All dogs underwent a full ophthalmic examination to exclude ophthalmic conditions that could alter iop. Dogs with systemic disease such as lymphoma, which could cause ocular disease and alter iop, were also excluded from the study. IOP was measured using a Tonovet rebound tonometer. To compare the average iop between the individual groups the Mann Whitney U test was used with the Bonferroni correction applied to correct for multiple comparisons. Within the systemic steroid group, Spearmans rank correlation coefficient test was used to identify correlation between intraocular pressure, dose of steroid treatment, duration of steroid treatment, and cumulative steroid dose.

A total of 59 dogs were included in the study: 21 dogs received no treatment, 21 dogs were on systemic steroids, and 17 dogs on topical steroids. There was no significant difference in age between the 3 groups (P=0.721). Comparison of the median intraocular pressure and the 25th and 75th percentiles was made between the 3 groups (Table 1).

Average iop percentiles	25	50	75
Control group	15.0	16.0	16.5
Systemic group	16.0	17.5	18.25
Topical group	17.5	19.0	19.75

Table 1: Median and interquartile range of iop (mmHg) for the 3 groups

There was a significant difference between groups (Kruskal-Wallis test $P<0.001$) with both steroid groups having significantly higher iop than the control group. There was a tendency towards a weak positive correlation between iop and duration of treatment ($r_s=0.477$, n=17; $p=0.053$) in the topical group but not in the systemic group ($r_s=-0.219$, n=21; $p=0.169$).

The results of this study show that dogs on both topical and oral corticosteroids have a significantly higher iop than in control dogs. While no animal showed glaucoma, steroid use should be cautioned in dogs predisposed to the condition.