Oral presentations

Optimising topical ophthalmic drug delivery in the canine eye by reducing drop volume—preliminary investigations

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OBJECTIVES

The standard volume of a drop from an ophthalmic bottle is much larger than the volume of the canine tear lake. Previous studies regarding changes in heart rate and blood pressure associated with the use of topical phenylephrine show that trans-conjunctival absorption of topical drops can provoke systemic effects. Here we investigate whether drug delivery can be optimised by reducing drop volume.

METHODS

Pupils of greyhounds used for clinical teaching were dilated for fundoscopy either using 1% tropicamide from a standard minim vial or from one with a Gilson pipette tip attached to reduce the drop volume. Drop volume was measured by determining drop weight on a micro-balance. Degree of mydriasis was measured photographically and pupil size and time to full dilation were compared for the two delivery methods.

RESULTS

Volumes of drops from the two delivery devices were $31.4 \pm 15.0\mu\text{l}$ for the minim single dose dispenser vial and $10.0 \pm 3.4\mu\text{l}$ from the minim vial with attached pipette tip, these volumes being significantly different at $p < 0.0001$. Even though only one third of the volume was dispensed, the degree of maximum dilation (12.1 and 13.0 mm) and time to maximum dilation (60 minutes for both methods) was not significantly different.

STATEMENT (CONCLUSIONS)

The fact that a drop only one third the volume of one from the standard minim dispenser still gave the same mydriatic effect shows that methods to reduce drop volume should be used to minimise systemic absorption of topically administered drugs. Further work is required to investigate systemic effects of drugs at different drop volumes.

Difference in prevalence of age-related cataract in dogs in the UK and New Zealand: a consequence of differential ultraviolet light exposure?

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OBJECTIVES

Daylight exposure, and particularly ultraviolet (UV) irradiation, is accepted as an important factor in the genesis of

age-related cataract in humans. Here cataract prevalence in dogs was compared between the UK and New Zealand (NZ) two areas with substantially different levels of UV irradiance.

METHODS

Data already collected on cataract prevalence for 2000 dogs in the UK was compared with data gathered through ophthalmic examination in this study for 97 dogs in Kaitaia, NZ. The age at which 50% of the population had cataract (C50) was calculated for each population and compared with a Chi squared test.

RESULTS

The age profile of the dogs in both populations was not significantly different ($p = 0.98$) but cataracts occurred at a younger age in NZ dogs (C50 = 7.5 years) compared with those in the UK (C50 = 9.4) these values significantly different at $p = 0.0047$. All dogs in the UK population had lens opacity by the age of 13.5 while the comparable figure was 11.5 years in the NZ population.

STATEMENT (CONCLUSIONS)

Kaitaia is located at a latitude of 35.1° South and the UK at 55° North, with total annual hours of sunlight estimated at 2115 for Kaitaia and 1374 for the UK and at least twice

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the UV irradiance in Kaitaia. Given that other factors such as diet and medical treatment were not significantly different between the two populations, the substantially

earlier onset of age-related cataract in NZ dogs is highly likely to be related to high UV levels associated with depletion in the ozone layer at southern latitudes.

Survey of owner attitudes toward the application of eye drops in dogs and cats with ophthalmic disease

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OBJECTIVES

Compliance of veterinary clients in administering ophthalmic medication to their pets has received little attention compared to compliance in human medicine. This study aimed to investigate owner attitudes regarding the ease of eyedrop administration.

METHODS

This study used questionnaire-guided interviews, asking what the temperament and ease of handling of the pet was,

how often owners successfully applied drops, how easy they found it to apply medication (ease score: 1 very easy to 7 not possible), whether they needed help in providing treatment, whether the temperament of their pet had changed during treatment and if so in what manner, whether they had developed techniques to render treatment less stressful and how they felt about treating their pet. A convenience sampling method was used. All respondents gave informed consent to their opinions being evaluated.

RESULTS

Results from 15 cat owners and 33 dog owners showed an ease score for dogs was 3.3 ± 0.4 and for cats 4.5 ± 0.4 and that temperament was not a predictor of ease of treatment. More compliant owners had more success treating their pets. 64% of dog owners and 93% of cat owners reported negative behavioural changes during treatment, including avoidance, nervousness and aggression. 58% of dog owners and 80% of cat owners associated treating their pets with negative emotions such as stress, worry, nervousness and guilt.

STATEMENT (CONCLUSIONS)

This study suggests that emotional factors and the impact of the client's relationship with their pet are important factors in compliance to prescribed treatment protocols.

Evaluation of the I-PEN, a hand-held device for rapid measurement of tear osmolarity in the canine patient

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OBJECTIVES

Previous reports have documented the use of electronic devices to measure tear-film osmolarity but devices such as the TearLab osmometer are cumbersome and expensive to use. Here a handheld solid state electronic diagnostic device for the quantitative measurement of tear-film osmolarity is evaluated for use in canine patients. The disposable tip of the device is held adjacent to the conjunctiva of the lower conjunctival sac and measures the impedance of the tear film

bathing this tissue, calculating tear osmolarity within a few seconds.

METHODS

Animals assessed included twenty dogs with a normal tear film as diagnosed by ophthalmic examination and a Schirmer tear test (STT) reading over 15 mm/min, and ten dogs with keratoconjunctivitis sicca (KCS), diagnosed by finding of ocular surface pathology characteristic of dry eye and a STT reading of less than 15 mm/min.

RESULTS

The I-PEN device was easy to use and tolerated well by all animals. Osmolarity was 331.9 ± 11.4 mOsm/L in normal eyes and 348.9 ± 18.4 mOsm/L in eyes with KCS, these values being significantly different from each other ($p < 0.05$).

STATEMENT (CONCLUSIONS)

This study shows that the IPEN is a useful device to determine tear-film osmolarity in canine patients. Given that high osmolarity is thought to be a key factor in ocular surface pathology in dry eye, determination of tear osmolarity may be valuable in assessment of dogs with KCS.