An analysis of systemic glucocorticoid use in cats and dogs

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Introduction

Glucocorticoids are among the most widely used (and misused) class of drugs in veterinary medicine (1) yet there is little information on prescribing patterns in general practice. Therapeutic protocols often result from clinical experience, common sense and information from human medicine. However, the adverse metabolic effects are difficult to separate pharmacologically from the therapeutic benefits, making glucocorticoids potent yet potentially dangerous compounds.

The Bateson Independent Inquiry into Dog Breeding (2) recommended that high priority should be given to the creation of a computer-based system for the collection of anonymised diagnoses from veterinary surgeries in order to provide statistically significant prevalence data for each breed. This should build upon the work already started by the Royal Veterinary College.

Description of prescribing practices and analysis of risk factors for treatment with glucocorticoids using computerised clinical records from primary practices could facilitate the benefits while minimising the adverse effects of this important drug category.

Aims and objectives

1. To describe and compare **prescribing practices** for systemic glucocorticoid pharmacotherapy in **cats and dogs**
2. To evaluate **predictors** for systemic glucocorticoid treatment in primary UK veterinary practice
3. To evaluate **VEctAR Animal Surveillance** (3) as a data collecting system for scientific study analyses

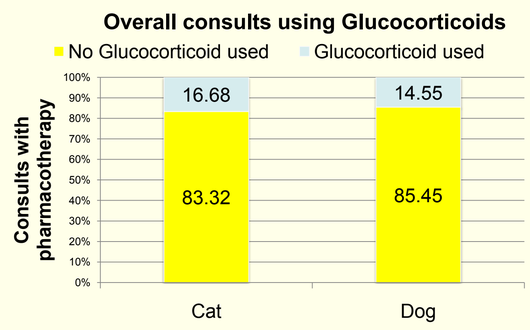
Materials and Methods

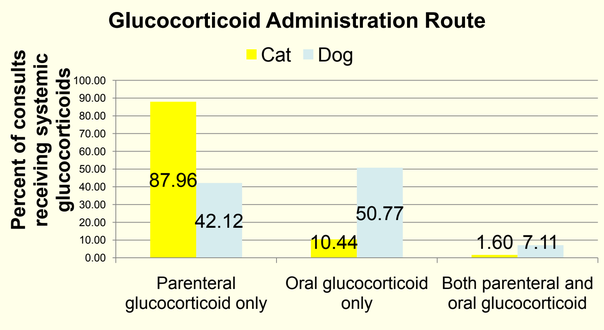
Data collection: Three UK small animal practices comprising 7 veterinary clinics were recruited to the **VEctAR Animal Surveillance** pilot project. Practice selection was based on use of a specified computerised Practice Management System (PMS) (RXWorks) as well as a willingness to participate. Vets were asked to assign diagnoses to consults selected from the **VeNom Codes** (4) embedded into their PMS. Data in specified fields on all clinical records from 2007-2009 were captured. The RVC Ethics and Welfare Committee granted ethical approval.

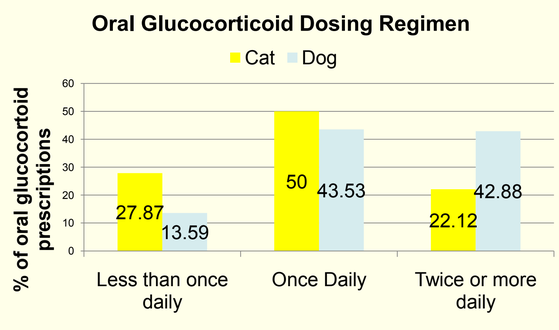
Analysis: Extracted data were entered into Microsoft Office Excel 2007 before checking and cleaning. All non-veterinarian and non-cat/non-dog observations were dropped. Summary diagnoses were classified into broad pathophysiological categories as well as on a dermatological basis. Variables assessed included clinic ID, age category, sex, neuter status, purebreed status, month, season, dermatological condition, pathophysiological condition, dog-breed size and cat-coat type. Treatment data were searched for systemic glucocorticoid generic and brand names and doses (mg/kg) were calculated using recorded pet weights.

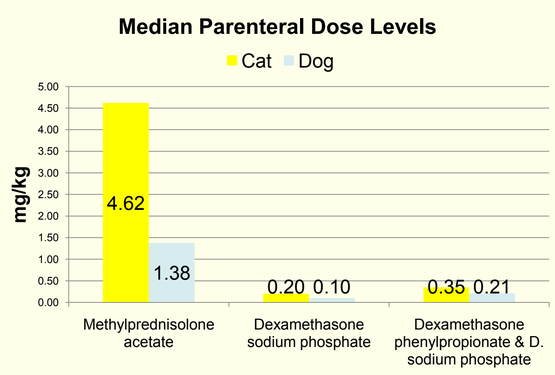
The data were exported to Stata Version 11 for analysis separately by cat and dog based on consultation outcome: whether a systemic glucocorticoid was used or not. Descriptive statistics were generated. Risk factors were analysed using mixed-effects logistic regression. Including 'animal ID' as a random effect took account of clustering of consultations within patients.

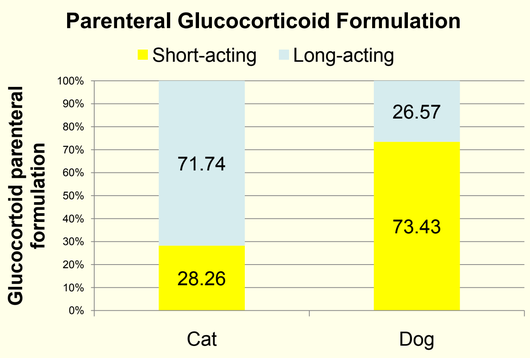
Descriptive Glucocorticoid Prescribing Practices

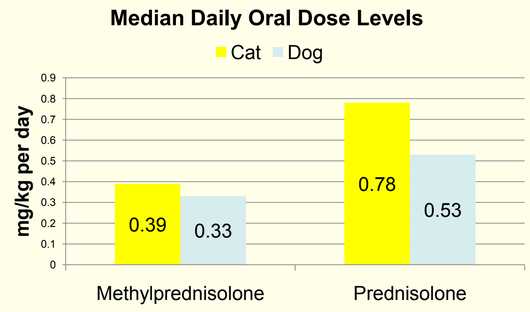












Summary: Three practices comprising 7 clinics and 24 vets contributed 31,273 consultations including pharmacotherapy (cat 11,254, dog 20,019). 67.39% of consults had a summary diagnosis recorded.

- Overall, 15.32% of consultations with pharmacotherapy included systemic glucocorticoids.
- For cats 89.56% of consults using a systemic glucocorticoid included a parenteral treatment while the figure for dogs was 49.23%.
- Cats received 71.74% of parenteral glucocorticoids as long-acting treatments while dogs had 26.57% long-acting.
- For oral glucocorticoids, 22.12% of cats had twice-daily or more frequent dose regimens compared with 42.88 of dogs.
- Median prednisolone daily doses for cats was 0.78mg/kg and for dogs was 0.53mg/kg.

Risk Factors for Glucocorticoid Therapy

Final multivariable mixed effects regression modelling included clinic ID, pathophysiological indication, skin disease, age category and sex for both cat and dog models.

Clinic variation was wide, both between clinics for the same species as well as within clinics comparing the species. One clinic had an OR 1.91 (95%CI 1.27-2.87, P<0.0001) for feline consults while having an OR 0.61 (95%CI 0.48-0.78, P<0.0001) for canine consults of glucocorticoid therapy compared with the same referent clinic. Neoplastic conditions increased the odds of treatment with glucocorticoids compared with conditions requiring anti-inflammatory (not incl. hypersensitivity conditions) treatment (cat model OR 4.28 95%CI 2.93-6.24, P<0.0001). The odds ratio for glucocorticoid treatment in skin disease cases in dogs was 6.75

	Final Model (P-value)	
Variables included	**Cat Model**	**Dog Model**
Clinic ID	P=0.0027	P<0.0001
Pathophysiological indication	P<0.0001	P<0.0001
Skin disease	P<0.0001	P<0.0001
Age category	P<0.0001	P<0.0001
Sex	P=0.0011	P=0.0650

(95%CI 5.81-7.85, P<0.0001) compared with non-dermatological cases. Cats aged between 1 and 7 years had 3.41(95%CI 2.00-5.81, P<0.0001) times the odds of treatment compared with cats under 1 year. Male cats had 0.72 (95%CI 0.57-0.90, P<0.0001) times the odds compared with female cats while male dogs had 1.16 (95%CI 0.99-1.35, P=0.0650) the odds compared with female dogs.

VEctAR Animal Surveillance

This study demonstrates that the **VEctAR Animal Surveillance** system can be used to generate meaningful data on a large scale using primary practice caseloads. This data is analysable to answer scientific questions relating to conditions and treatments where primary veterinary practitioners hold essential information. The method of assigning summary diagnoses resulted in a high coding rate and greatly aided analysis and interpretation.

What next.....

VEctAR Animal Surveillance developments since the pilot phase have included:

- ✓Extension of the pilot project to a full national surveillance system
- ✓Recruitment of practice chains, charity, OOH as well as smaller practices
- ✓Continued work with RxWorks and now additional PMS providers
- ✓Ongoing standardisation of veterinary terminology by **The VeNom Coding Group**
- ✓Four PhD studies now incorporating VEctAR Animal Surveillance data

References:
(1) Glucocorticoids, Mineralocorticoids and Adrenolytic Drugs in Veterinary Pharmacology and Therapeutics. Ferguson, D.C., Dirikolu, L., Hoenig, L.Wiley-Blackwell. 2009
(2) Independent Inquiry into Pedigree Dog Breeding. Bateson, P. Micropress Ltd, Halesworth, Suffolk. 2010
(3) VEctAR Veterinary Electronic Animal Record Animal Surveillance. www.rvc.ac.uk/VEctAR
(4) The Venom Coding Group. www.venomcoding.org

This work is supported by the RSPCA.
Thank you to RxWorks and selected RxWorks client practices for their collaboration.