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Guest Editorial

Feline allergic asthma and experimental models: The sky is the limit

In a review published in this issue of *The Veterinary Journal*, Dr. Carol Reinero gives an extensive overview of the pathogenesis, diagnosis and therapy of feline asthma (Reinero, 2011). As a leader in the field of respiratory immunology in feline medicine, Dr. Reinero summarises the evidence supporting the view that asthma is an allergic reaction in cats.

The first part of the article indicates the potential value of feline asthma for respiratory research in humans. Indeed, there is evidence that allergic diseases in humans and pet animals occur concomitantly and similar environmental allergens seem to be implicated in both human and feline asthma (Schafer et al., 2008). Moreover, asthmatic cats share the most important features of human asthma, namely, recurrent and variable symptoms of chronic airway disease, including airflow restriction, bronchial hyperresponsiveness and airway inflammation (Busse, 2007).

An important issue in respiratory feline medicine is the need to distinguish between allergic asthma and chronic bronchitis. Reinero (2011) addresses this point by considering the clinical features, the cytological changes in bronchoalveolar lavage fluid (BALF) and pulmonary function tests. If it is relatively easy to investigate experimental models of feline asthma from a functional, inflammatory and even morphological point of view (Padrid et al., 1995; Norris Reinero et al., 2004; Kirschvink et al., 2007), the same investigations remain difficult in clinical conditions where pulmonary function is almost never assessed and where BALF cytology alone appears to be a poor discriminating criterion.

In human respiratory medicine, pulmonary function testing remains an indispensable tool for confirming the diagnosis of asthma and in differentiating it from chronic obstructive pulmonary disease. The accuracy of differential diagnosis between spontaneous asthma and chronic bronchitis in cats can only be improved if non-invasive and/or easily applicable pulmonary function tests are performed in combination with analysis of BALF cytology. Our experimental models of asthma (providing rather clear-cut features of allergic asthma) can serve as excellent indicators, but we must be aware of their intrinsic limitations, in that only one condition (asthma) is modelled and not the other (bronchitis).

The gap between clinical and experimentally-induced disease even becomes greater when considering therapeutics, and although placebo-controlled studies have only been performed in experimental cats, those therapeutic approaches considered as the gold standard in human medicine (i.e. inhaled glucocorticoids and bronchodilators) have been tested. Data about efficacy and

guidelines regarding dose regimens are available and should improve the (often) empirical use of various treatments in practice.

Novel therapeutic approaches based on nutraceuticals (omega-3 polyunsaturated fatty acids plus luteolin), the salivary immunomodulatory peptide feG-COOH, leukotriene antagonists, antiserotonergic drugs or rush immunotherapy provide interesting and sometimes promising experimental results (for details, see Reinero, 2011) but are far from 'clinical reality'. Clinical studies are needed to further explore the potential value of inhaled medications, immunotherapy or other treatments in feline asthma patients.

At a time where issues of animal welfare are increasingly important (and sometimes limiting) in research, one might ask whether publishing data on experimentally-induced asthma in cats makes sense. Two feline asthma models investigated by two research groups within the last 10 years have generated more than 25 peer-reviewed publications. The majority of these publications are considered by Reinero (2011) as well as in a recent clinical review by Venema and Patterson (2010). The conclusion from reading these articles is yes.

Despite the difficulty of translating results from research to practice and the absolute need for clinical research to validate experimental results, it would be short-sighted to believe that these experimental models have reached their limit and are of no more use for the future. The feline model could well be used for the investigation of airway remodelling, which remains challenging in human asthma. The model offers the unique possibility of a repeated follow-up of clinical features, lung function, airway inflammation and immunology based on well-established methods (Kirschvink and Reinhold, 2008). Remodelling could be assessed in cats by use of bronchial brushings, bronchial biopsies and efficiently complemented by modern thoracic imaging using computerised tomography scans, scintigraphy and magnetic resonance imaging. If the experimental models can evolve in this direction, the sky would be the limit.

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