Rationale: Cat dander is ubiquitous in our environment and is one of the most potent indoor allergens causing an IgE mediated Type 1 allergic response. While patients may be sensitized to several different allergens found in the dander, the major ones are Fel d 1 and Fel d 4 which are responsible for more than 80% of these individuals exhibiting IgE antibodies to these two allergens. The purpose of this preliminary work was to measure the levels of Fel d 1 and Fel d 4 found in saliva, fur and urine of male and female domestic house cats and to determine whether there are differences in allergen levels dependent on breed, gender, sterilization status and age.

Methods: Cats volunteered by owners from a local animal hospital were used for this study. Owners signed an informed consent prior to any sample collection. Twenty cats were studied, five in each of four cohorts: neutered males, neutered females, females not in estrus and males. The breed, age, weight and health status of each cat was recorded. Commercially available ELISA kits were used to measure the allergen levels and a standard curve created from the Fel d 1 and Fel d 4 standards. Triplicate samples were analyzed to allow for a sufficient sample size for analysis and comparison.

Conclusions: The information generated by this study will be used to determine the characteristics of cats to be housed in a cat allergen challenge room in order to obtain consistent levels of airborne allergen.

Introduction

Household pets produce allergens which can induce perennial allergic rhinitis and asthma in humans. By far the most important cause of allergy is sensitization to cat dander. Of the several cat allergenic compounds identified, Fel d 1, is considered to be the major allergen (1). This protein is ubiquitous and air sampling has shown it to be present even in cat-free areas. It is mainly produced by the sebaceous and salivary glands and can be demonstrated in fur (2) and skin (dander) of cats (3). Fel d 4, a lipocalin protein, is thought to be the second most potent allergen produced by cats and a proportion of cat-allergic patients have measurable serum antibodies (4). However, since there is no commercial analysis testing available for Fel d 4, these data will be reported at a later date.

Our goal is to setup a cat chamber for controlled exposure to cat dander and the purpose of this study was to determine which types of cats would be best for this purpose. Published studies indicate that male cats produce higher levels of Fel d 1 than females and that castration results in decreases in Fel d 1 (5). There is little information about the effect of breeding on Fel d 4 levels. The purpose of this study was to assess the levels of Fel d 1 in fur, saliva, and urine, of different breeds of cat and to determine whether age, gender or neutering had an effect on the levels. This information will be used to help RMT determine the best choice of cats for the cat exposure chamber.

This study was conducted in collaboration with a local cat hospital. Twenty-one cats at least 8 months of age undergoing routine procedures that required anesthesia were volunteered by the pet owners and recruited for this study. Cats were not enrolled if they had clinically significant dental, skin or other health problems. Owners signed an informed consent before any samples were collected from the cats.

The breed, age, sex, reproductive status and health status of each cat was recorded in the source notes. A fur sample was collected from the front leg of each animal by shaving close to the skin. The samples were placed in plastic bags and stored at 4°C. Approximately 120 μg of fur was weighed from this sample for Fel d 1 analysis. Once the cat was anesthetized, a clean, soft plastic pipette was placed in the cheek pouch (both sides) to withdraw fresh saliva. Lemon juice was used to stimulate saliva production and sample volumes of 0.25 to 0.5 ml were collected. Approximately 3.0 ml of fresh urine was collected by catheterization. Both saliva and urine samples were placed in sterile 1.8 ml polypropylene test tubes (BD Falcon, Franklin Lakes, NJ) and refrigerated at 4°C. Aliquots of 120 μl were removed and placed in sterile 0.5 ml cryovials and frozen at -20°C until shipped to the lab for analysis.

Samples were analyzed for Fel d 1 using a commercial Enzyme-Linked Immunosorbent Assay (ELISA) (Indoor Biotechnologies, Charlottesville, VA). Triplicate samples were analyzed and the average value reported.

Results

The cats recruited for the study came to the clinic for a variety of procedures that required anesthesia [Table 1]. The six cats who were spayed were younger than the others (0.99 ± 0.36 vs. 8.47 ± 3.17 years, p = 0.001). As a result, assessment of the relationship of spaying to Fel d 1 levels is confounded by age. No side effects or adverse events were recorded as a result of sample collection.