Table 1

Test	Patient 1	Patient 2
CBC	Normal	ND
Total serum IgE	64 IU/L	ND
Guinea pig RAST*	> 17.5 kU/L	ND
Environmental allergen RAST*	Negative	ND
Guinea pig ELISA¶	Positive at 1.08	Positive at 1.29
Percutaneous skin test		
Guinea pig	ND	Positive
Environmental allergens	ND	Positive#

* Commercial RAST
¶ In-house ELISA
ND Not done

protein assay. ELISA inhibition testing was performed as follows. 100 μl of sera (1:20) in PBS and 5% milk was incubated with 50 μl of several concentrations of guinea pig extract for one hour at room temperature and overnight at 4°C. Immulon II polystyrene microtiter plates (Fisher Scientific, Itasca, IL) were coated with the antigen by incubating for 2 hours at room temperature and overnight at 4°C with a 5 μg/ml dilution of the extract. The plates were then washed and blocked for one hour with PBS and 0.3 % Tween 20. Sera inhibition was continued for another hour at room temperature, then 50 μl of PBS and 0.3% Tween 20 was added to the sera to prepare for ELISA. Following washing of the plates, the sera were added to the wells and incubated for 3 hours at room temperature. Plates were washed and a 1:500 dilution of biotinylated-goat anti-human IgE was added for 1 hour. Following a 1-hour incubation with 1:1000 streptavidin-labeled peroxidase, *o*-phenylenediamine was added for 30 minutes, and the reaction stopped with 6N sulfuric acid. The optical density (OD) was read by spectrophotometry at 490 nm.

Results

Case One

RAST to guinea pig was strongly positive (>17.5 kU/L). All other antigens tested were negative (<35 kU/L). Complete blood count was normal. Serum IgE was 64 kU/L (<114 kU/L).

Case Two

Percutaneous skin testing was positive (equivalent to histamine control with negative saline control) to guinea pig epithelium extract. Skin reactivity was also detected to cat dander as well as ragweed, grass, and tree pollens.

Both Cases

ELISA demonstrated elevated levels of serum-specific IgE to crude extracts of guinea pig fur in both patients with net optical density of 1.08 and 1.29 for case 1 and 2, respectively. There was no serum-specific IgE identified in the control sera. ELISA inhibition with guinea pig allergen resulted in complete absorption of specific IgE antibody (Figure 1). The results indicate that there is no cross reactivity between hamster and guinea pig and that the antibody detected in the two cases are antigen-specific and therefore relevant. There also was minimal inhibition with hamster extract.

Discussion

Guinea pigs are popular household pets because of their small size and the minimal time and expense involved in their care. Two major guinea pig allergens, Cav p I and Cav p II, have been identified [7,8]. Guinea pig dust, dander, fur, urine and saliva have been found to be the more potent extracts when compared to whole pelt, feces, and serum [9]. Inhalant allergens may be derived from material shed from the guinea pig coat after contamination with saliva and urine [8]. The size of airborne particles derived from guinea pig urine and dander resulting in the most allergenic activity have been shown to be of a diameter either greater than 5 microns or less than 0.8 microns, thus small enough to penetrate the lower respiratory tract when inhaled [10]. Therefore, it is not surprising that asthma can occur when sensitized individuals are exposed to guinea pigs.

In contrast to domestic settings, laboratory animal allergy (LAA) is well documented [1-5]. Approximately one third of laboratory animal workers have occupational allergy to animal dander [3]. While rats and mice are primarily used in the laboratory setting, guinea pig use is also common [4]. In a large epidemiologic study of LAA utilizing a questionnaire, the subjects handling guinea pigs reported the highest prevalence of symptoms suggestive of LAA (31%) [5].