Prevalence of sensitization to animal epithelia allergens in Egyptian patients with respiratory allergy

Thesis
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Manar Farouk

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List of Abbreviations

ACE	Angiotensin converting enzyme
AERD	ASPIRIN-exacerbated airway disease
anti-IgE	Anti-immunoglobulin E
AR	Allergic rhinitis
BD	Bronchodilator
Can f2	Canis familiaris
CBC	Complete blood count
CSF	Cerebrospinal fluid
EAST	Enzyme Allergo Sorbent Test
EIB	Exercise-induced bronchospasm
Equ c1	Equus caballus
Fel d1	Felis domesticus
FENO	The fractional concentration of exhaled nitric oxide
FEV1	Forced expiratory volume in 1 second
FVC	Forced vital capacity
HEPA	High-Efficiency Particulate Air
HRCT	High resolution computed tomography
ICS	Inhaled corticosteroid
IgE	Immunoglobulin E
IgG	Immunoglobulin G
IL	Interleukin
INS	Intranasal steroids
IU/mL	International Unit/milliliter
KU/L	Kilo Unit / liter
LABA	Long acting B2 agonist
LTRA	Leukotriene receptor antagonist

List of Abbreviations (Cont.)

MHC	Major histocompatibility complex
NSAID	Non steroidal anti-inflammatory drug
Ory c 3	Oryctolagus cuniculus
PEF	Peak expiratory flow
RAST	Radio allegro sorbent tests
s IgE	Specific immunoglobulin E
SABA	Short acting B2 agonist
SIT	Allergen-specific immunotherapy
SPT	Skin prick testing
TCR	T-cell receptor
TGF-β	Tissue growth factor-β
TH2	T helper 2
TSLP	Thymic stromal lymphopoietin

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Prevalence of sensitization to animal epithelia allergens in Egyptian patients with respiratory allergy

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ABSTRACT:

Exposure to animal allergens is a major risk factor for the development of sensitization and allergic diseases such as asthma, allergic rhinitis/conjunctivitis, and atopic dermatitis. Besides mites and cockroaches, the most important animal allergens are derived from mammals .The most frequent pet allergy is allergy to cats and dogs. However, in recent years it has become more and more popular to have other animals as pets, so that the risk of exposure to new and unknown potential allergens increased. **Objectives**: To assess the prevalence of sensitization to animal epithelial allergens among Egyptian patients with respiratory allergy. **Study design** : a cross sectional study conducted on 200 newly diagnosed patients with respiratory allergy including allergic rhinitis and / or bronchial asthma attending allergy and immunology clinic in ain shams university hospitals each patient was subjected to a detailed history , spirometry , skin prick test to common aeroallergens and specific IgE to common animal allergens .**Results** :Prevalence of allergy to common animal allergens in patients with positive skin test was 44 % in comparison to 56 % positive SPT to other allergens with Positive SPT for cat allergens were the highest prevalence 30% followed with horse 28.5% then dogs for 21.5% then hamsters 13.5% then mixed feather 9.5% then rabbit 7.5% and the lowest percentage was for guinea pig 1%.**Conclusion**:allergy to common animal allergens is common among Egyptian patients with respiratory allergy .

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Introduction

Exposure to animal allergens is a major risk factor for the development of sensitization and allergic diseases such as asthma, allergic rhinitis/conjunctivitis, and atopic dermatitis **(Arshad, 2010)**. Besides mites and cockroaches, the most important animal allergens are derived from mammals. The most frequent pet allergy is allergy to cats and dogs. However, in recent years it has become more and more popular to have other animals as pets, so that the risk of exposure to new and unknown potential allergens increased **(Diaz-Perales et al., 2013).**

Animal allergens are mainly produced in the liver or secretory glands and localized in animal skin and body fluids, such as urine, saliva, blood, milk, and sweat. These proteins adhere to fur and other surfaces. The allergens can be efficiently dispersed into the environment as animals shed hair and dander, and secrete or excrete fluids **(Zahradnik and Raulf, 2014).**

Exposure to animal allergens is not limited to direct contact to animals. Based on their aerodynamic characteristics, animal allergens can be transferred to environments that were never occupied by the animals, such as public buildings, including schools, day-care centers, hospitals, and offices.Although, the concentrations of the allergens are low in these environments, they may be high enough to cause symptoms in sensitized individuals **(Ritz et al., 2002).**

Contact with animals arises via many different occupations and activities. Cats, dogs, guinea pigs, hamsters, and rabbits are all very popular pets in industrialized countries, where the percentage of pet ownership continues to increase **(Diaz-Perales et al., 2013)**.

Horses, whose use has decreased in agriculture, are today widely owned for recreational riding and show activities. Horses are considered to be one of the most important and significant sources of mammalian allergens. Horse allergy occurs in people who regularly work with horses, either professionally or for recreational purposes, and in people indirectly exposed to horses through allergens on riding clothes. Horses are able to generate large amounts of airborne allergens. Elevated levels of horse allergen were found outdoors often in the close vicinity of stables. Horse allergy occurs among people who regularly handle with horses, either professionally or for recreational purposes, and is mainly characterized by rhinitis, conjunctivitis, asthma, and occasionally by urticaria. Symptoms are highly correlated with the levels of allergen exposure **(Gawlik et al., 2009).**

Another important source of occupational animal allergies is the handling of laboratory animals **(Bush and Stave, 2003)**.

Rodents, especially mice and rats, are kept in large numbers in research facilities of universities and pharmaceutical industries. In addition to these rodents housed in laboratories or occasionally kept as pets, mice, and

rats can infest human urban and agricultural environments, where they find food supplies and have few predators (**Zahradnik and Raulf, 2014).**

Nowadays, avoidance therapy is the best measure for the prevention of any pet allergic reaction. Bimolecular characterization of allergens remains essential to the development of emerging therapeutic modalities to treat respiratory symptoms, such as attenuated allergy vaccines (**Ritz et al., 2002).**

Aim of The Work

To assess the prevalence of sensitization to animal epithelial allergens by skin prick testing using standardized allergen extracts and confirmatory specific IgE level among Egyptian patients with respiratory allergy (asthma and/or allergic rhinitis).

Chapter 1

Sensitization to animal allergens

Acute and chronic allergic diseases such as respiratory allergy, chronic urticaria and atopic dermatitis can be caused commonly by aeroallergens including: pollens, mites, molds and animals(**Refaat et al., 2010**). The most important animal allergens that are responsible for respiratory allergy are derived from mammals, principally cats, dogs, rats, mice, horses, and cows, which secrete or excrete allergens into the environment (**Chapman and Wood, 2001).**

Contact with animals emerges by means of various occupations and exercises. Cats, dogs, guinea pigs, hamsters, and rabbits are all exceptionally well known pets in industrialized nations, where the rate of pet possession keeps on expanding (**Díaz-Perales et al., 2013)**.

Horses, whose use has decreased in agriculture, are today widely owned for recreational riding and show activities. Horses are considered to be one of the most important and significant sources of mammalian allergens,as they can generate large amounts of airborne allergens. **(Gawlik et al., 2009).**

Cows are commonly used farm animals for dairy and meat production. Another important source of occupational animal allergies is the dealing with laboratory animals **(Bush and Stave, 2003).** Rodents, particularly mice and rats, are kept in extensive numbers in research facilities of colleges and pharmaceutical commercial enterprises. Not with standing