



Libyan International Medical University

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Can Early Exposure to Cats and Dogs Decrease the Risk of Developing Allergies

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Date of Submission: 31/05/2017.

Report submitted to fulfil the requirements of the respiratory block in the 2nd year of Basic Medical Sciences in the Libyan International Medical University.

Abstract:

It's commonly known that sensitization to cats and dogs is an important risk factor for developing allergic diseases such as asthma and allergic rhinitis. Interestingly, latest researches have proved that they can also decrease the risk of developing allergic disease if you were exposed to them early in your life. For the past couple of decades' researchers have been looking at the role that pets, especially dogs, have to play in rates of allergies in children. Many have found that, what is being termed the hygiene hypothesis, is indeed correct, meaning that a little dirt early in life helps to stave allergic diseases. Even though researchers have agreed that dogs surely decrease the risk of developing allergies, there is a controversy about whether cats decrease them, or in fact heighten them. The objective of this review was to compare between 3 different studies that showed different findings on the topic.

1. Introduction:

1.1 Definition of Allergies: Allergies, also known as allergic diseases, are a number of conditions caused by hypersensitivity of the immune system to something in the environment that usually causes little or no problem in most people. The immune system mistakes an otherwise harmless substance as an invader, this substance is called an allergen. The immune system overreacts to the allergen by producing Immunoglobulin E (IgE) antibodies. These antibodies travel to mast cells that release histamine and other inflammatory chemicals, causing an allergic reaction.

1.2 Causes of Allergies (Allergens): Common allergens include pollen, animal dander, and certain food, particularly peanuts and milk. Metals and other substances may also cause problems. Food, insect stings, and medications are common causes of severe reactions. Their development is due to both genetic and environmental factors. ⁽¹⁾

1.3. Definition of Atopy: Atopy refers to the genetic tendency to develop allergic diseases such as allergic rhinitis, asthma, and atopic dermatitis (eczema). Atopy is typically associated with heightened immune responses to common allergens, especially inhaled allergens and food allergens.

2. Can Early Exposure to Cats and Dogs Decrease the Risk of Developing Allergies:

2.1. Pet Exposure May Reduce Allergy and Obesity:

Recent studies suggest that pet exposure, particularly in early childhood, may have beneficial effects and may actually prevent the development of atopic disorders.

A new *University of Alberta* study showed that babies from families with pets - 70 per cent of which were dogs - showed higher levels of two types of microbes associated with lower risks of allergic disease and obesity. Researchers found that having a dog seemed to have some "immunotherapy" benefit and reduced other allergies by as much as four times.

The latest findings from *Anita Kozyrskyj*, a University of Alberta pediatric epidemiologist and one of the world's leading researchers on gut microbes, and her team's work on fecal samples collected from infants registered in the Canadian Healthy Infant Longitudinal Development study build on two decades of research that show children who grow up with dogs have lower rates of asthma.

The theory is that exposure to dirt and bacteria early in life - for example, in a dog's fur and on its paws - can create early immunity, though researchers aren't sure whether the effect occurs from bacteria on the dogs or from human transfer by touching the pets.

The team explained the connection by identifying that exposure to pets in the womb or up to three months after birth increases the abundance of two bacteria, *Ruminococcus* and *Oscillospira*, which have been linked with reduced childhood allergies and obesity, respectively.

The abundance of these two bacteria were increased twofold when there was a pet in the house, in addition, pet exposure was shown to affect the gut microbiome indirectly - from dog to mother to unborn baby - during pregnancy as well as during the first three months of the baby's life. In other words, even if the dog had been given away for adoption just before the woman gave birth, the healthy microbiome exchange could still take place. ⁽²⁾

2.2. The Exposure to Both Cats and Dogs Together Decreases the Risk of Developing Allergies Further:

A longitudinal investigation by Mandhane and coworkers provides further evidence that exposure to the most common pets, cats and dogs, lowers the risk of developing allergic sensitization, not only in children but also in young adults.

The study of Mandhane et al. extends to adulthood, providing an opportunity to examine whether or not exposures to cats and/or dogs contribute to the development of atopy over time. The data comes from a large, unselected, population-based birth cohort with a length of follow-up that extended to 32 years. The study showed that living with cats and dogs was associated with a lower risk of developing atopy during childhood and young adulthood.

Interestingly, the observed protective effect of pet ownership was seen only in subjects who had had both types of animals at home. Moreover, the reduction in risk of sensitization applied to both indoor and outdoor allergens. ⁽³⁾

2.3. Pet Dogs Reduce Allergies in Children, But Cats Increase Them:

Another research carried out by the scientists at the University of Cincinnati had agreed on dogs having a beneficial impact on immunity, however, an allergic child that had a cat in the house saw a dramatic increase in their sensitivity to reactions. While they could not be sure what caused the difference, it does reignite debate between cat and dog owners.

The new study examined the relationship between pet ownership and eczema. Researchers found that dog ownership among children with dog allergies may reduce the risk of developing eczema by age 4 years; cat ownership, however, may increase the risk among children with cat allergies.

The team led by Dr. Tolly Epstein gathered data from 636 children enrolled in the Cincinnati Childhood Allergy & Air Pollution Study (CCAAPS), a long-term study examining the effects of environmental particulates on childhood respiratory health and allergy development. Children enrolled in the study are considered at high risk for developing allergies because they were born to parents with allergies.

The researchers focused on several potential risk factors for developing eczema, including dog and cat ownership. The children were tested for 17 separate allergies on a yearly basis from ages one to four years, and the parents completed yearly surveys.

The results provided interesting information regarding pet ownership. The researchers found that children who tested positive for dog allergies were less likely to develop eczema by age four years if they owned a dog before age one year. It showed that children who owned a cat before age one year and were allergic to cats based on a skin allergy test were 13 times more likely to develop eczema by age 4 years. Unlike dog ownership, cat ownership seemed to have a negative effect on children with cat allergies. ⁽⁴⁾

Conclusion:

Finally, from the previous studies it has been concluded that even though the exposure to dogs during infancy was associated with the decreased risk of developing allergies from indoor and outdoor allergens, the exposure to cats, however, remains a debatable subject. This immunity comes from the transmission of a type of bacterium found in dogs' fur that is associated with decreasing the risk of developing allergies when exposed to in the mother's womb or before one year of age. More researches are being made on the topic, and pharmaceutical companies are considering to inject this type of bacterium in pregnant women as a vaccine to help prevent atopic disorders in the next generation.

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