CORRELATION BETWEEN HOME MITES AND HOUSE DUST ALLERGY AMONG EGYPTION ASTHMATICS

THESIS

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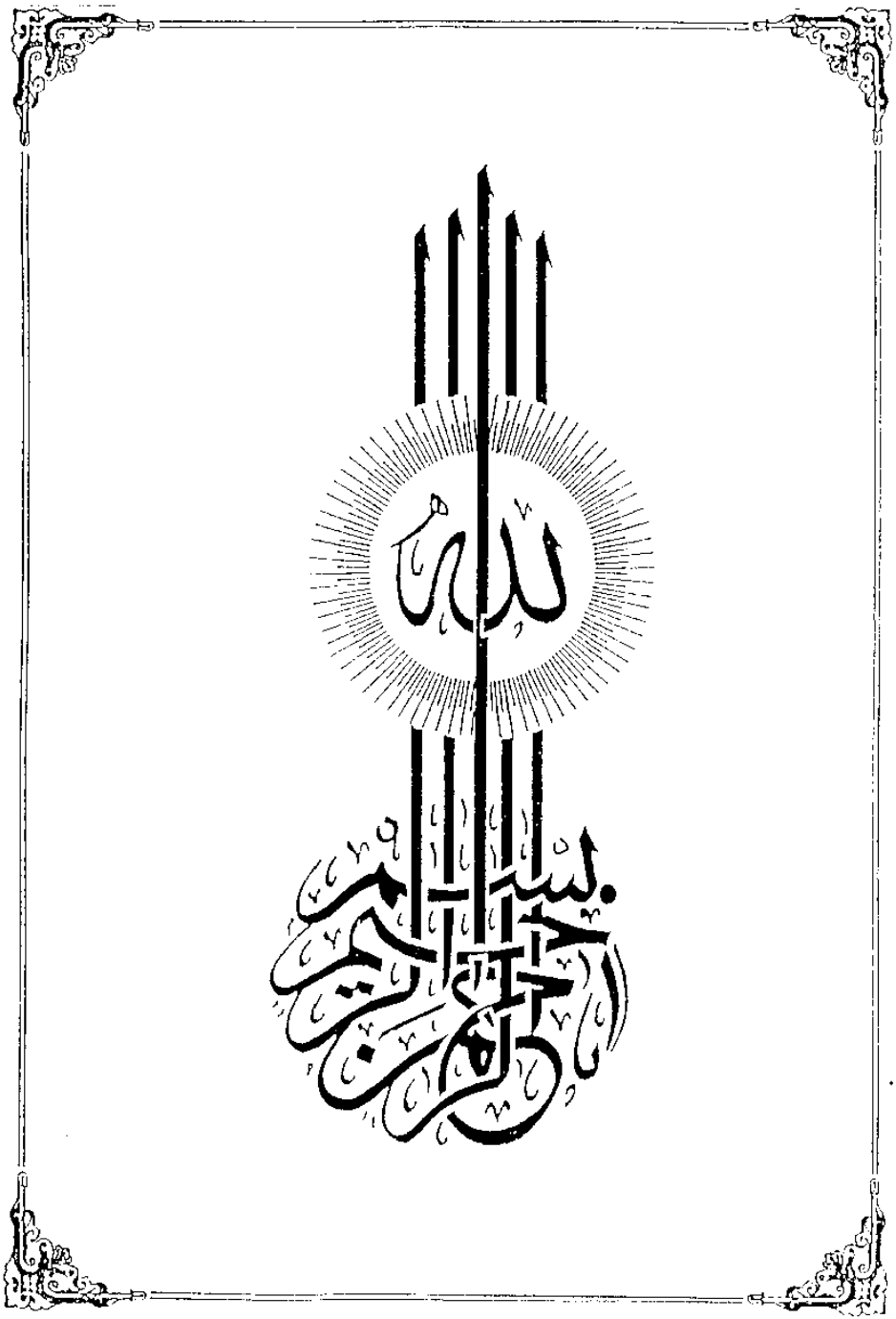

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INTRODUCTION

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More than half a century has elapsed after the demonstration that components of house dust are important etiological factors in bronchial asthma. The importance of house dust as an allergen was first recognized in 1921 by Kern, although it has been observed as early as 1898 by Sir John Flayer also by Storm Van Leeuwen, 1922; Maunsell, 1960, house dust was long been known to cause sneezing and wheezing in sensitive subjects.

Salem (1957) using skin testing found that 61.9% of asthmatic patient in Egypt were sensitive to house dust. In Birmingham, house dust appears to be the most common allergen precipitating asthma in children as judged by clinical pattern and skin tests with crude dust extracts (Smith 1960). As the reaction, to house dust extract, in these children, show a degree of correlation with a history of dust sensitivity and with the commonest form of perennial asthma in children, which is usually worse at night and is often relieved by admission to hospital or to a residential open air school.

Allergy plays a more important role in children and young people. El-Hefny, 1966 in a study done on Egyptian asthmatic children reported that 80.1% of the cases studied were allergic to house dust. El-Mehairy and El-Tarabishi (1967) reported that of 213 patients with positive skin test, 110 (51 %) were found to be sensitive to house dust alone , 42 (21%) were sensitive to house dust together with other allergens and 61 (28%) were sensitive to other allergens than house dust. Aas.K.(1969) found that 85% of 809 children with bronchial asthma were sensitive to house dust when skin tested. He tried at 1970 to support this results by inhalation provocation test in 1035 childrens, he found that 63% of them showed positive results. Khalifa et al. (1979) using skin testing found that children sensitive to house dust comprised 60.20% of 28 patients studied. Nevertheless, there is still much confusion about the nature and source of allergens present in house dust and house dust extracts.

REVIEW OF LITERATURE

ALLERGENIC COMPONENTS IN HOUSE DUST

The house dust may be composed of large particles and microscopic fragements of textile fibres, hairs and skin detritus from human individuals and animals as cat and dog dander to this organic or non-organic contaminants such as pollen, mould spores and minerals are added from the outdoor atmosphere dependent on geographic situation, season, wheather and wind factors.

All or most of these materials is found in different stages of denaturation and may provide nutritive sources for numerous microorganism such as virus, bacteria, moulds, as well as, many species of insects and mites. Thus it is no wonder that susceptible individual become allergenic to one or several of these components which are inhaled regularly through several hours every day.

Patients having allergy to these components may react to the inhaled dust and a number of them are not necessarily allergic to the gennine house dust allergen (Aas. K. 1976). So patients allergenic to certain moulds may also be exposed to an abundance of the particular mould allergens when inhaling the house dust (Fre et al., 1962). Therefore a few patients appear to be sensitive to the more obvious constituents of house dust-for example wool, feathers,

moulds but in the past the main source of the house dust allergen has not been detected.

The identity of the principal allergen in house dust has eluded allergists for many years, until 1964, when Voorhorst , Spieksma-Boezeman and Spieksma in Holland and Oshima in Japan Published their first results, mites have long been associated with allergic disorders of the respiratory tract.

In earlier accounts of suspected mite allergy the species alleged to cause respiratory symptoms had been those associated with the infestation of stored grain, hay and other form products and the patients affected chiefly farmers, farm workers or those whose occupations had involved them in handling or contact with infested materials. In 1923 Ancona attributed out breaks of dermatitis and asthma among grain workers in southern Italy to the grain itch mite pyemates (pediculoides rentricosus). A year later, a case of sever asthma in a Dutch farmers was reported by storm Van Leeuwen, Bien and Varekamp to have been caused by inhalation of grain dust from oats heavily infested by Acarus Siro and Glyeyphagus sp. In a later study, Storm Van Leeuwen (1925) wrote that the frequent and sever asthma

suffered by Dutch farmers in the Van Zeeland island was caused by exposure to heavily mite infested grain.

In Ceylon, Carter, Wedd and D'Abrera (1944) were the first to detect mites (Acarina) in the sputum of asthmatic patient with high eosinophilia. This discovery was confirmed by Soysa and Jayavardena (1945), who also suspected that the syndrome might result after exposure to inhalation of airborne mites. Carter et al. (1944) have recovered from the sputum of patients suffering from respiratory complaints various types of mites, including species of genera Tyroglyphid, Tarsonemus, Carpaglyphus, Glyciphagus and Cheyletus. These mites were species commonly present in stored products, dust and debris of houses, shapes and stores. Further investigation in Ceylon by Carter and D'Abrera (1946) have verified the previous finding.

In Spain at 1954 Taboada had been able, in his studies of this syndrome, to verify the ideas that had been so carefully and clearly presented by Soysa, and the results of this investigation are in complete agreement with his views concerning the symptomatology, pathogeny and therapy of this syndrom. He believed

that pulmonary acariasis is a perfectly delimted pathological entity which should be seperated from allied respiratory disorders.

K. Maunsell (1952 a) noted that many patients developed signs of house dust asthma when living in old houses built in badly drained soil, often close to canals and streams. Similar observation were made in Leiden, by Varekamp and his colleagues (1966), where there are many open and concealed waterways.

A biological agents thriving under such conditions was suspected and attention was therefore given to the mould flora. Tests in allergic individuals, however, showed that reactions to moulds and to house dust were not parallel and the hypothesis that moulds were the cause of house-dust allergy had to be discarded (Manusell 1952b,Davies 1960). Evidence of the occurrence in house dust of another biological agent thriving under damp conditions came from the Netherlands (Voorhorst et al., 1964, 1969). This was a mite of the genus Dermatophagoides.

MITES AS ALLERGENS IN HOUSE DUST:

As far bach as 1928 Dekker found that mites were often present in dust samples taken from bedding and upholstered furniture from houses of patients with asthma. The mites isolated were species commonly found in stored cereals and grains but he mentioned one that he was unable to identify. Dekker's work received no attension at the time of publication but in 1964 Voorhorst et al., and Oshima reported the occurrence of species of Dermatophagoides in house dust, identified by Fain (1966) as Dermatophagoides pteromyssinus. This species vas the most abundant in house dust in Holland and skin reaction with an extract of it ran parallel to those of house dust (Voorhorst et al., 1964). They considered that, this mite was the cause of house dust allergy.
In further study done by Voorhorst et al. (1967) and Spieksma (1967 a) they claim that probably the major source of house-dust allergen is a little-known acarine mite, genus Dermatophagoides, and particularly Dermatophagoides pteronyssinus which grows best on human dander. Human dander itself is regarded as an important source of allergen (Voorhorst 1962); and Berrens et al. (1965) regarded it as a major source of house-dust allergen.

The role of the allergens of human dander in house dust allergy and their relationship to the extracts of Dermatophagoides pteronyssinus cultured on human dander which were used by Voorhorst and his colleagues has been raised by Berrens (1967) who suggested that there are two distinct allergens in house dust, one of which is derived from human dander and the other from house dust itself, presumably of the plant origin. He and his colleagues suggested that recaction of the atopic subject to both allergens may be explained by their having determinants in common (Berrens et al., 1965). Henocq et al.(1966) also reported that human dander and house dust have two different allergens inspite of the parallelism of their reactions in patients with atopic eczema and they found that the house dust extract is 200 times stronger than that of human dander.

Voorhorst and Spieksma (1967) claim that the amount of human dander allergen in their test extract of Dermatophagoides pteronyssinus far too low to give reactions. The trials done after that and their results support the hypothesis that Dermatophagoides pteronyssinus is the major source of house dust allergen.

In 1968, in London, K. Manusell examined house dust sample from 186 houses in southern England. The most common species occurring in these houses was Dermatophagoides pteronyssinus which was found in 82 % of the samples. Also common but less frequent and less numerous , was Euroglyphus maynei , those was found in Just over 40% of the samples. These two species accounted for 82% of the total mite population in house dust. Also common but far less abundant, were predator species belonging to the genus Cheyletus and the house mite C. domesticus. Dust from control houses did not differ in their mite content from those of asthmatics. The number of mites varied in samples from different sites in the houses. The mean values of the number of mites per equal weight of samples were lowest in those from the floor of living rooms, higher from the floor of bed rooms and higher still from the surface dust of bedding. Also his results support the hypothesis that D. petronyssinus is the major source of the house dust allergy. Extracts of D. pteromyssinus from culturs reared separately on skin scales and powdered biscuit meals, and prepared