

IMPROPER WINDOW AIR- CONDITIONING OF HOME AND OCCURRENCE OF HOUSE DUST MITE ALLERGEN INFESTATION IN MUMBAI CITY WOMEN

Sir,

The incidence and severity of allergic diseases is on the rise worldwide. Sensitization to indoor allergens, especially, domestic mites, is a well-known etiologic factor for these diseases. In India, mite sensitivity is common in the coastal areas, like Mumbai. Mumbai being the business capital of India, socioeconomic status of citizens is high and air-conditioning is becoming increasingly popular. Those who are in general practice are well aware of air-conditioning related complaints from patients such as rhinitis, perennial cold, difficulty in breathing, etc.

The present study was carried out to assess the effect of window air-conditioning at home on occurrence of house dust allergy and

house dust mite infestation in serum of Mumbai city women. House dust mite (HDM) levels are directly related to air exchange rate and indoor humidity.^[1,2] A total of 950 women were screened and 100 of them were randomly recruited for the study. The ladies were briefed about the research project and consent was obtained from them to participate in the study. Detailed history was obtained about their residential conditions and allergic status. Venous blood sample of these women was collected and the serum was analyzed by monoclonal enzyme-linked immunosorbent assay to detect the presence of domestic mite allergens Der p1 and Blo t5. Methods used for the statistical analysis of the obtained results were descriptive statistics, Chi-square test, Fisher exact test and Mann-Whitney U test. Two-tailed probability was reported for significance.

Air-conditioned habitat was found to be a significant risk ($P < 0.001$) for house dust allergy (OR = 9.9, 95% CI 3.7-26.6). Seventy-eight percent (39/50) women from air-conditioned habitats versus only 26.3% (10/38) women from non-air-conditioned habitat were suffering from house dust allergy. Allergy status in study subjects was evaluated based on detailed allergic history. The kind of allergic diseases presented by study subjects were asthma, allergic rhinitis, urticaria and atopic dermatitis. Air-conditioned habitat was found to be a significant risk ($P < 0.001$) also for serum HDM allergen infestation (OR = 5.0, 95% CI 2.0-12.5). Sixty-four percent women from air-conditioned habitats had domestic mite allergens present in the serum [(Der p1 1.78 ± 2.07 ng/ml) and (Blo t5 1.69 ± 1.86 ng/ml)], which were significantly elevated

($P < 0.001$) as compared to 26.32% women from non-air-conditioned habitats [(Der p1 0.59 ± 1.29 ng/ml) and (Blo t5 0.48 ± 1.09 ng/ml)]. The women could be categorized into five groups [Figure 1].

Thirty-six percent women were having house dust allergy and serum Der p1 and/or Blo t5 infestation versus 32% women living in non-air-conditioned homes having neither house dust allergy nor serum Der p1 and Blo t5 infestation. The occurrence and concentration of serum HDM allergen infestation was found in 64% women residing in air-conditioned habitats [(Der p1 1.78 ± 2.07 ng/ml) and (Blo t5 1.69 ± 1.86 ng/ml)], which was significantly elevated ($P < 0.001$) as compared to that in 26.32% women from non-air-conditioned habitats [(Der p1 0.59 ± 1.29 ng/ml) and (Blo t5 0.48 ± 1.09 ng/ml)]. Eight percent of women staying in air-conditioned homes had house dust allergy but were not having serum Der p1 and Blo t5 infestation, which probably indicates that they might be allergic to the component of house dust other than HDM allergens Der p1 and Blo t5, such as cockroach or, most likely, mold allergens.^[3] Our results are not in accordance

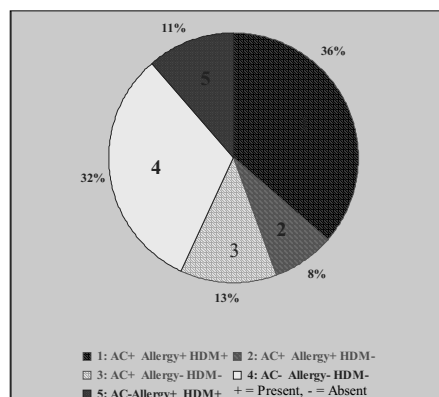


Figure 1: Air-conditioned habitat, detection of HDM allergen and occurrence of allergy in women

Table 1: World allergy organization guidelines versus practices in Mumbai air-conditioned homes

WAO guidelines for HDM control	Practices in Mumbai air-conditioned homes
Constant maintenance of low level humidity	Fluctuation in humidity: Air-conditioner improper size Frequent switching off for energy savings Poor maintenance of AC filters
Adequate ventilation	Air-tight rooms Compromised ventilation
Adequate sun-light exposure of the indoors	Shading Compromised sun-light exposure of the indoors
High water activity areas like bath-rooms, wash areas, indoor-plants away from bed room	High water activity areas like bath-rooms, wash areas, indoor-plants attached to bed-room

WAO - World allergy organization, HDM - House dust mite

with the study of Lintner and Brame,^[4] who have reported that air-conditioning can provide effective humidity control to reduce mite population. Though it is difficult to directly compare our study results with others due to the difference in climatic conditions, study populations, residential characteristics and socioeconomic status of the subjects; 13% of our study subjects living in air-conditioned habitats had neither house dust allergy nor serum Der p1 nor Blo t5 infestation. So, the culprit may not be the air-conditioning itself, but it may be the practices contraindicated to the World Allergy Organization (WAO) guidelines for prevention of allergy and allergic asthma,^[5] which are present in Mumbai air-conditioned homes [Table 1].

In conclusion, there is a trend for higher occurrence of house dust allergy and serum HDM infestation in Mumbai residents having air-conditioned indoors. Such information may alarm the house-dust-allergic and HDM-sensitive patients, especially those who have installed or have decided to install air-conditioning with a view to improve the internal air quality and reduce the allergen exposure. Treating clinicians also must give a thought to the 'improper air-conditioning' related possible continued exposure to significant concentrations

of HDM allergens being responsible, if their dust-mite-sensitized patients do not improve symptomatically even after taking all the other recommended avoidance measures.

REFERENCES

- Harving H, Korsgaard J, Dahl R. House-dust mite exposure reduction in specially designed, mechanically ventilated "healthy" homes. *Allergy* 1994;49:713-8.
- Arlan LG. Water balance and humidity requirements of house dust mites. *Exp Appl Acarol* 1992;16:15-35.
- Jaakkola JJ, Jaakkola N, Ruotsalainen R. Home dampness and molds as determinant of respiratory symptoms and asthma in pre-school children. *J Exp Anal Environ Epidemiol* 1993;3:129-42.
- Lintner TJ, Brame KA. The effects of season, climate and air conditioning on the prevalence *Dermatophagoides* mite allergens in household dust. *J Allergy Clin Immunol* 1993;91:862-7.
- Johansson SG, Haahtela T. World Allergy Organization Guidelines for Prevention of Allergy and Allergic Asthma. Condensed Version. *Int Arch Allergy Immunol* 2004;135:83-92.

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