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## Introduction

House dust mite avoidance is advised in dust mite sensitized patients with allergic rhinitis (AR) to decrease their risk of developing symptoms. Maintaining a stable room temperature and a relative humidity (RH) of less 50% is recommended for reducing the growth and survival rate of dust mites. This study was to investigate the effect of newly invented temperature and humidity control machine on the level of dust mite allergens and total nasal symptom scores (TNSS) of dust mite sensitized allergic rhinitis children.

## Methods

Children (8-15 years) with dust mite sensitized persistent AR were enrolled. The temperature and humidity control machine was installed in the bedroom for 6 months. TNSS were assessed before and every month after machine installation and the level of dust mite allergens (Der p1 and Der f1) from the mattress were measured before and every 2 months after machine installation using enzyme-linked immunosorbent assay (ELISA).

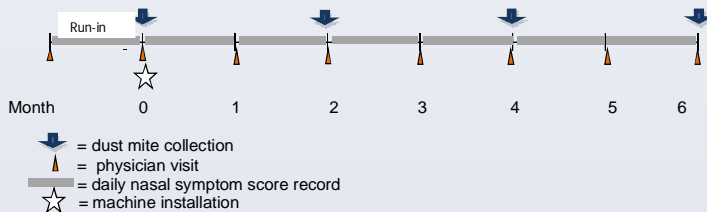


Figure 1: Study protocol

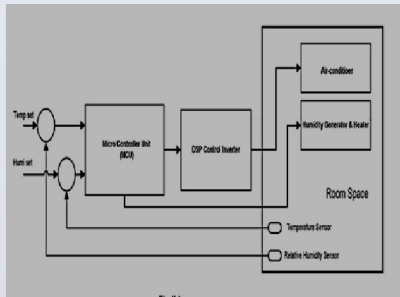


Figure 2: The newly invented temperature and humidity control machine (A). Diagram demonstrating the operation system of the machine with the air conditioner (B).

## Results

A total of 7 children with house dust mite sensitized allergic rhinitis were enrolled. Four children were male, mean age was 9.8 years, mean age of onset was 4 years and mean duration of symptom was 4 years. Three children also had asthma. Baseline characteristic of the patients was shown in table 1.

Table 1: Baseline characteristic of participating children

Age (yr)	Sex	Duration of AR (yr)	Age of onset (yr)	Other allergic diseases	Severity	Wheal size for Dp by SPT	Wheal size for Df By SPT	Baseline TNSS	
1	12	M	1	7	Drug allergy	Mild persistent	6*5	8*6 with pseudopod	3.45
2	12	F	7	4	AD, food allergy	Mild persistent	9*7	12*6 with pseudopod	1
3	8	M	2	6	No	Moderate persistent	10*5 with pseudopod	10*5 with pseudopod	6
4	8	M	6	2	Asthma	Mild persistent	7*7	10*6	1
5	11	F	4	7	Asthma	Moderate persistent	10*6	16*15	7.6
6	10	M	1	8	No	Mild persistent	10*25	10*8	3
7	8	F	7	1	Asthma	Mild persistent	17*15	23*13	1.83

AR : Allergic Rhinitis, SPT : Skin Prick Test, TNSS: Total Nasal Symptom Scores

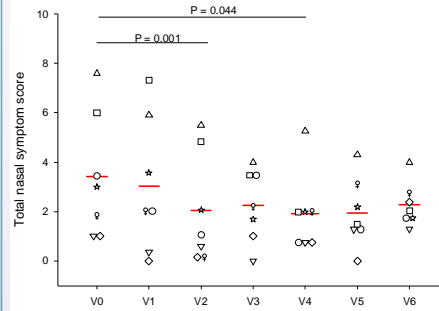


Figure 1 Clinical symptom score in each visit after machine installation. V0=before machine installation, V1,2,3,4,5, and 6 represent 1,2,3,4,5 and 6 months after installation respectively. Same symbol represents data from same subject

Five out of seven patients were able to stop using their intranasal corticosteroids.

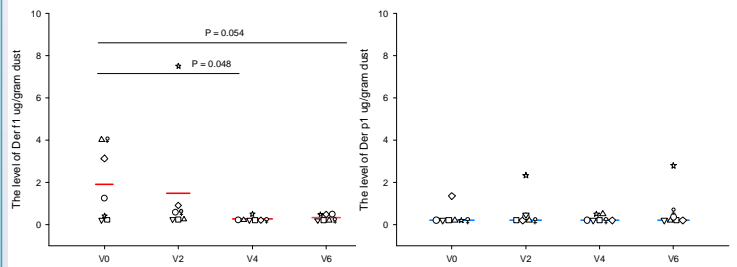


Figure 2 The level of house dust mite antigen Der f1 (A) and Der p1 (B) in each visit after machine installation. V0=before machine installation, V2, 4, 6 represent 2, 4 and 6 months after installation respectively. Same symbol represents data from same subject.

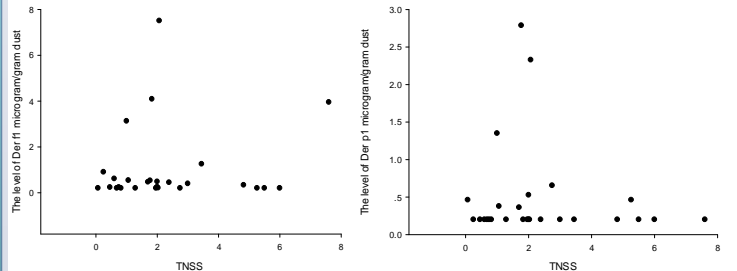


Figure 3: The level of house dust mite antigen Der f1 (A) and Der p1 (B) and total nasal symptom scores. There was no correlation between the TNSS and the level of Der f1 or Der p1

## Conclusions

The current study has demonstrated that the newly invented temperature and humidity control machine was able to decrease the level of dust mite antigen in the bedroom of dust mite sensitized allergic rhinitis children. There was also a modest improvement in clinical symptoms of allergic rhinitis. Larger and well control studies are required to confirm the efficacy of this machine.

## Acknowledgement

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## Conflict of interest

In relation to this presentation, I declare that there are no conflicts of interest.