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ORIGINAL ARTICLE

Permanent Cure of Allergic Rhinitis

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ABSTRACT

Background: The allergic rhinitis is one of the most miserable disease and most of the sufferers waste a lot of time in place of earning and at home. The main treatment of this disease is avoidance of allergen. There are many different ways to avoid allergens but it is not acceptable for many patients in the long term. These are use of nasal filter and face mask, change of job, change of city etc.

Aim: To assess the effectiveness of air purifier in the management of allergic rhinitis.

Methods: As this is not possible in many cases, doctors prescribe different medical treatments. Systemic therapy includes different types of antihistamines, immunotherapy and steroids such as nasal sprays and topical decongestants. Every treatment modality has its own complications like topical decongestants cause rhinitis medicamentosa which is very difficult to manage. Steroids are prescribed in oral or injectable form. It causes hypertension, gastritis and peptic ulcers, re-distribution of body fat, Cushing's syndrome and hirsuitism. Moreover patient has lack of concentration, sleepiness and dryness of nose. In long term follow up these medical interventions are not effective as many patients are non compliant due to side effects of these treatment modalities. Now in this new era it is possible to clean our room air from allergens and other agents by different methods, which can prevent the allergic rhinitis.

Results: We are dealing with only nasal allergies and not vasomotor rhinitis, which is a completely different disease as it involves autonomic nervous system. We advised patient to purchase and use air purifier at home and during duty in the office. Patient may use special mask containing HEPA (High Frequency Particulate Air Filter) filter when they are working outside

Conclusion: Air purifier machine contains HEPA filter, which sucks the air of room and remove the particles of size up to, even viruses and bacteria are also removed. Now patients feel comfortable in this healthy environment and sleep without any symptoms like itching, rhinorrhoea, blocked nose and eye problems resulting in improved quality of life.

Keywords: Allergic rhinitis, Particulate matter, Air purifier

INTRODUCTION

How air purifier cleans air? If you add extra things in air, it feels okay but actually it isn't clean air. In a closed room, air will consists of dust, pollen and other impurities which can be harmful to your health. Some people might have problems, especially those with allergies. At places where there are high levels of pollution, air can be hazardous and so it is necessary to clean it. Also with seasonal variation load of allergens especially pollens fluctuate in our country. One of the most common ways to clean air is to use air purifier which filters the air using a special filter called HEPA filter. HEPA filters are specialized filter which does not let pollen, dust and other impurities of size 2.5 microns or greater with an accuracy of 99.97%. These filters have a usage life depending on the pollution level of air it is filtering. Sometimes you have to completely replace the filter or sometimes it can be reused by washing.

Air pollution particles consist of PM 2.5 and PM 10 meaning air particles of size 2.5 microns and 10 microns. These particles are in the form of dust. Air purifiers containing HEPA filter can clean out different types of dust, smoke, mold, smell and odors.

The objective of the study was to assess the effectiveness of air purifier in the management of allergic rhinitis.

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PATIENTS AND METHOD

A cross sectional analytic study carried out in 100 patients. They used this device at home. The age of the patient ranges from 20 to 60 years. In this study we have 70% males and 30% females. Patients were convinced to purchase air purifier and use it at night in the bed room and in the office also. In this study we included 100 patients of either gender that were diagnosed with allergic rhinitis on the basis of history and examination and lab test. Patients were followed for 4 months and their response was recorded on the basis of objective improvement in their symptoms, in a pre designed pro-forma. Permission from Ethical Committee was obtained.

They were instructed to clean filter every week with vacuum cleaner or blower. We observed that their feedback is very encouraging and their symptoms improved a lot. We instructed the patients to start the device one hour before sleep. Machine has two indicators

of allergen load present in the room, when you start machine it shows red light and when room is completely free of allergens it shows green light.

A Pro-forma was prepared and distributed to the patients and their family members before the start of study. Pro-forma included details and time of severity of their symptoms. After every 2 weeks we evaluated the patients and recorded the response. After 4 months of use of air purifier we concluded its effectiveness by recording final response of patients.

Inclusion criteria: We include the patients who have moderate to severe allergic rhinitis. Age of the patient between 20-60 years. Written consent of voluntary participants taken before start of study. The study was based on 7 parameters: Headache, Nasal Obstruction, Nasal itching, Rhinorrhea, Post nasal drip, Sneezing and Decreased sense of smell. Each symptom was scored 0-3 points as follows: 0 No symptoms, 1 Mild symptoms (Controlled by simple medication), 2 Moderate symtptoms (Difficult to control and interrupting daily activities and sleep) and 3 Severe symptoms (Difficult to control and interrupting daily activities and sleep)

Exclusion criteria: Known patient of asthma and other medical problems. Any congenital problem of the nose and facial structure potentially obstructive nasal defects such as deviated nasal septum.Patient having rhinitis (vasomotor, gustatory, drug induced and infectious). Patients were using systemic corticosteroids for a long time for any other problem. People who are working in the dusty environment in the field. Patient who have some physiological or mental problem and could not sleep without medicine. Patient who cannot co-operate fully because they are under stress most of the time. This study was carried out at home. Size of the device was selected according to the size of the room. Patients were followed for 4 months. They were not allowed to use any medication for allergic rhinitis like oral antihistamine, steroids or any type of nasal sprays. If patients have any pets they were instructed to keep them outside. The study was conducted in the month of 1st June, 2020 upto 30th September, 2020.

RESULTS

One hundred patients were included in the study with the symptoms of headache, nasal obstruction, itching of the nose, rhinorrhea, post nasal drip, sneezing and decreased sense of smell. These symptoms were graded as mild, moderate and severe. Patients were given pro-forma to fill it and verbal consent was taken to include in this study. Patients were asked weekly to explain the symptoms how much clinically improved. The analysis of the symptoms at the start of the study was:

Symptoms	Percentage
Headache	30%
Nasal Obstruction	70%
Itching of nose	70%
Rhinorrhea	60%
Post nasal drip	75%
Sneezing	45%
Decreased sense of smell	20%

As patient agreed to use air purifier in bedroom and in the office daytime, in this way patients were spending 20 hours in allergen free area. The purifier was kept on the bedside table during sleep. The machine should be started one hour before sleep. Patients were called to attend the clinic after 2 weeks. We questioned the patients about improvement of their symptoms and recorded in pro-forma. The results were noted every 2 weeks on the mentioned sheet. In our study patients gave feedback that 96 % of their symptoms were improved but the degree of relief varied among individuals.

Symptoms	%age	Grade of improvement in first 2 weeks
Headache	30	20%
Nasal Obstruction	70	60%
Itching of nose	70	60%
Rhinorrhea	60	55%
Post nasal drip	75	60%
Sneezing	45	40%
Decreased sense of smell	20	10%

After this patient used to come every 2 weeks and we are recording that their systems are improved and sometimes we have to discuss with those patients which do not have any improvement. During discussion we found that sometimes pets and flowers are present in the house. The cleaning methods of bed sheets were not accurate. 5% patients develop symptoms of sneezing and rhinorrhea due to uncontrolled room temperature. We observed almost all patients are improving upto their satisfaction.

DISCUSSION

Allergic rhinitis is one of the most common chronic atopic diseases. It affects 10% to 40% of the population worldwide. Prevalence of allergic rhinitis is increasing day by day[1]. It is defined as IgE mediated Type 1 hypersensitivity immune response to specific allergens. When allergens come in contact with mast cells which are present in lining mucosa of nose and upper respiratory tract, degranulation takes place which release chemical mediators. Clinically these mediators cause nasal congestion, rhinorrhea (nasal drainage), sneezing, and/or nasal itching[2,3].

Increased environmental pollutants over the past few decades resulted in increased airway sensitivity[4]. Pollution is a mixture of various particulate matters (PM) which are of various sizes and composition. The smallest PM are of the size of 2.5 µm about 30 times smaller than human hair. The largest ones are of the diameter of 10 µm. These PM are composed of acids, metals, soil, dust, allergens, pollens and molds; which are injurious for health when inhaled. In Lahore the air quality index is labeled as “severe” (151-200) as determined by Aslam et al in his study in 2019[5].

Non-exhaust emissions from traffic arising from abrasion of brake, tire, and road surface material, as well as from re-suspension of PM by passing traffic, in addition to exhaust emissions have adverse affects on asthma, rhinitis, allergic sensitization and lung function[6]. In addition to these outdoor pollutants indoor pollutants also add to hypersensitivity and allergic response of airways. These

indoor pollutants include house dust mites, animal dander, fiber particles, insect's body parts and molds[7].

There are many different pharmacological interventions aimed to control allergic rhinitis. Every modality has its adverse affects. The best way to control allergic rhinitis is to avoid allergens. In fact early allergen avoidance may prevent the development of allergic rhinitis and asthma. Various studies have shown that physical interventions aimed at lowering or eliminating indoor PM is very effective[8,9].

There are many devices that are designed to clean air in the sleeping vicinity of and individual. One of the most common ways to clean indoor air is to use air purifier containing HEPA filter. Air purifiers relieves symptoms of asthma, eliminates harmful chemicals, neutralizes unpleasant odors, reduces the chance of air borne diseases and improves sleep[11]. HEPA filters are specialized filter which filters all types of allergens with an accuracy of 99.97%[10].

A study done by Jia-Ying et al studied the affect of air purifier and showed that after the air purifier was used, the PM 1.0, PM 2.5, and PM 10 all decreased[12]. One of the most common indoor allergen is house dust mite. Huang et al studied that due to early exposure of children to house dust mite, sensitization occurs and specific serum IgE levels are high in atopic children[13]. In one study by Wang et al, they concluded that house dust mite exposure is positively related to nasal itching but it has no association with total serum IgE levels[14].

There are many studies which concluded decreased burden of indoor PM after use of air purifier but none have studied about reduction in symptom score of allergic rhinitits. In our study after 6 months 46 patients had improved quality of life, 4 patients have little improvement.

As per study 96% of patients were improved. They never used any medication or nasal spray. It proves that the treatment of allergic rhinitis is avoidance.

Conflict of interest: None

CONCLUSION

After this study we understand it is a unique method to treat allergic rhinitis. Not only it abolishes the nasal systems but also improve the nasal breathing. This improvement in air flow give relief from symptoms of headache, body ache and mental irritability. Air purifiers one of the best methods in the treatment of allergic rhinitis as the main stay of treatment of allergy is avoidance. This is very simple, safe and non-invasive method.

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