



## ROLE OF DIETHYL CARBAMAZINE IN ALLERGIC RHINITIS: A COMPARATIVE STUDY

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**ABSTRACT** Allergic rhinitis is a common condition affecting 5-40% of general population and its prevalence is ever increasing. It is characterised by an IgE mediated inflammatory response of nasal mucosa to allergens and it has a close association with asthma. Not just environmental factors but genetic factors also play a role in its inheritance. Allergic rhinitis is associated with eosinophilia either in blood or tissues or both. In India tropical eosinophilia is very common. Diethylcarbamazine is proven to be efficient in treating tropical eosinophilia. This is a comparative study to evaluate whether or not there is an advantage of adding DEC 300mg for a period of 21 days to the standard treatment regime of allergic rhinitis. The standard regime comprises of antihistaminics, mast cell stabilisers, oral or topical steroids or both depending on the severity of symptoms. This study aims to know the efficacy of DEC in controlling the symptoms of AR along with its role in giving a longer redemption period to the patient.

**KEYWORDS :** Allergic rhinitis, asthma, diethylcarbamazine, eosinophilia, bronchial hyper responsiveness

### INTRODUCTION

Allergic rhinitis is a very common problem that we come across in daily practice in otorhinolaryngology. A very close association between allergic rhinitis and asthma has been demonstrated by several studies<sup>1,2,3,4</sup>. Childhood allergic rhinitis is strongly associated with adult onset asthma.

Allergic rhinitis is defined as symptoms of sneezing, nasal pruritus, airflow obstruction and mostly clear nasal discharge caused by IgE mediated reactions against inhaled allergens and involving mucosal inflammation driven by type 2 helper T(Th2) cells.<sup>5</sup> Allergens of importance includes seasonal pollens and molds as well as perennial indoor allergen such as dust, mites, pets, pests and some molds. The pattern of dominant allergen depends on the geographic region and degree of urbanisation. Sensitization to inhaled allergen begins during the first year of life, sensitisation to indoor allergens precedes sensitisation to pollens. Since viral respiratory infections occur frequently in young children and produce similar symptoms it is very difficult to diagnose allergic rhinitis in the first 2 or 3 years of life. The prevalence of allergic rhinitis peaks in second to fourth decades of life.<sup>6,7</sup> Having a parent with allergic rhinitis doubles the risk<sup>8</sup>. When persons are exposed to an allergen against which they are sensitised, cross linking by the allergen of IgE bound to mucosal mast cells results in nasal symptoms within minutes. This is due to release of neuroactive and vasoactive substances such as histamine, prostaglandin D2 and cysteinyl leukotrienes.<sup>9</sup> During the next hours through a complex interaction of mast cells, epithelial cells, dendritic cells, T cells etc inflammation develops in the nasal mucosa with the participation of wide array of chemo and cytokines.<sup>7,10</sup> As a consequence of mucosal inflammation, nasal symptoms can persist for hours after allergen exposure and mucosa becomes more reactive to the precipitating allergen as well as to other non allergogenic stimuli such as strong odour and irritants. Allergic rhinitis should be viewed as a constellation of these mechanism and not as a simple acute reaction to allergen exposure.

### METHODS

The present study is a comparative study carried out on 30 patients of allergic rhinitis in our clinical setup between August 2016 to August 2017. Out of the 30 cases, 15 cases are in the study group and 15 in the control group. In each case, the clinical diagnosis of nasal allergy is made on the basis of characteristic history and corroborative clinical findings after complete examination.

### INCLUSION CRITERIA

Patients with nasal allergy (history atleast of one year) in the age group 11 to 45 years

### EXCLUSION CRITERIA

- Vasomotor rhinitis

- Atrophic rhinitis
- HIV, pregnancy
- Hypersensitivity to DEC

A detailed clinical history and a complete physical examination including allergy evaluation is done and blood levels of eosinophils ie absolute eosinophil count is determined in each case. Out of the 30 diagnosed cases of allergic rhinitis, 15 were given diethylcarbamazine 300mg for a full duration of 21 days along with the standard treatment for allergic rhinitis and 15 were given just the standard treatment as per protocol.

### RESULTS

In present study, 60% are males and 40% are females, M:F 1.5:1 (Table 1). The age ranges from 11 to 45 years. Majority of cases 40% are in the age group 21-30 years followed by 30% cases in the group of 31-40 years, 20% cases in group of 11-20 years and 10% in the age group of 41-50 years.

In present study, family history is also an important part of observation. Out of 30 cases, 20% cases have history of single parent ie either father or mother being allergic, 10% cases have both father and mother with history of allergy, 40% cases give history of sibling being allergic while 30% do not give any significant family history (Table 2).

In present study absolute eosinophil count or AEC of all patients is tested and majority of cases ie 90% have AEC more than 300/cumm. Maximum no. of cases ie 45% are found to have AEC between 600-900/cumm followed by 35% cases with AEC between 300-600, 10% with AEC below 300/cumm and 10% more than 900/mm<sup>3</sup> (Table 3).

Diethyl carbamazine was given to the study group in full dose for a period of 21 days along with the standard treatment ie antihistaminics, steroids and mast cell stabilisers while in the control group only the standard treatment was given. Administration of DEC to the study group showed better response in terms of recurrence, long term symptom free period and overall duration.

### DISCUSSION

The incidence of nasal allergy in the present study is maximum in the age group of 21-30 years comprising 35% of total no cases which is in accordance with various studies. Ciprandi et al stated that majority of the cases in their study fell in the age group of 21-30 years.<sup>2</sup> Macmillan D in his study found maximum no. of patients between the age of 15-34 years.<sup>11</sup> Sheldon J.M had maximum number of cases between 20 and 40 years of age.<sup>12</sup>

In the present study the male : female ratio is higher ie 1.5 : 1 which is in accordance with other studies. Sertipane G.A in his case series showed 52% male and 48% female, the ratio being 1.08:1.<sup>13</sup> Wallace D.V. in his

study reported 66.3% male and 33.7% female with male : female ratio being 1.96:1

Continuous exposure is seen in farmers, field workers, students, hence increased incidence is seen in them.

In the present study ,65% cases have a positive family history. The role of genetics and family history has been well emphasised by Davila in the study on genetic aspects of allergic rhinitis.<sup>14</sup>

Woodward reported a positive family history in 48.4% patients<sup>15</sup> while Ciprandi in 60% of cases.<sup>16</sup>

In present study, majority of cases are susceptible to dust exposure. Seasonal changes and food stuff also seem to play a significant role in initiation of allergic response.

Wallace in his study found that majority of patients of allergic rhinitis were susceptible to dust, followed by wheat flour and milk<sup>17</sup>

In the present study, the AEC of all patient was done and majority of cases have more than 300/mm<sup>3</sup>. William T.K reported 74% cases of hay fever having blood eosinophilia<sup>18</sup>. Lowell F.C et al had similar results.<sup>19</sup>

The study group comprising 15 cases were given full dose of DEC 300mg for a period of 21 days had greater redemption and symptom free period, early resolution of symptom and less recurrence as compared to the control group. In young age group ie 21-30 years patient showed better response and symptom free periods as compared to other age groups. Other age groups of the study group also showed an edge as compared to the control group. India being a tropical country , tropical eosinophilia is very common and this may justify the better response in the study group. Similar findings were seen in the study conducted by KV Rao<sup>20</sup>

**CONCLUSION**

Nasal allergy and asthma are two ends of the same spectrum involving the respiratory tract and from various studies it is evident that one can lead to other.<sup>3,19</sup> Allergic rhinitis frequently presents bronchial hyperresponsiveness even in absence of asthmatic symptoms .India being a tropical country, tropical eosinophilia is very common.DEC interferes with cyclooxygenase and lipooxygenase pathways, reducing the products of inflammation such as thromboxane, prostacyclin, prostaglandin and leukotrienes.DEC in time shortens the duration of late allergic response although it has no effect on the immediate response. This may explain the better response in the study group with less relapse rate in the long run.

**Table 1 AGE AND GENDER DISTRIBUTION**

S.No	Age Group	Male	Female	Total (%)
1	11-20	3	3	20
2	21-30	8	4	40
3	31-40	6	3	30
4	41-50	1	2	10
Total		18	12	100

**TABLE 2 ASSOCIATION WITH FAMILY HISTORY**

S.No	Association with family history	No. of Cases	Total (%)
1	Single Parent	6	20
2	Both Parent	3	10
3	Siblings	12	40
4	No Family History	9	30

**TABLE 3 ABSOLUTE EOSINOPHIL COUNT**

S.No	AEC	No. of Cases	Total (%)
1	Upto 300	3	10
2	301 – 600	9	30
3	601 – 900	12	40
4	>900	6	20
Total		30	100

AEC absolute eosinophil count

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