

From the Department for Allergy (Head: Dr. R. Voorhorst)
Academical Hospital, Leiden, the Netherlands.

INTERRELATION OF ASTHMA AND VASOMOTOR
RHINITIS, OCCURRING IN PATIENTS
WITH HOUSE-DUST ATOPY

III. *In respect to the localization of the symptoms*

By

R. VOORHORST & J. DE VRIES

Asthma and vasomotor rhinitis come under one and the same nosological heading, yet one patient has only nasal symptoms, the next only asthma and a third symptoms of both. This problem however must be approached in quite a different way in atopic and in non-atopic respiratory allergy.

In the *atopic disease*, we start from the presumption that the causative allergens are inhaled with the air breathed, the greater part of them being caught by the nasal mucus membranes, while only a minor part reaches the deeper organs. If this were the only important factor then atopic vasomotor rhinitis should always come first and, only if the exposure to allergens were extremely high or (and) if the degree of atopic allergy were considerable, would symptoms of asthma then complete the allergic syndrome. Generally speaking this is true and in previous publications (*Voorhorst & Vermey-Scheltema* 1960, *Varekamp & Voorhorst* 1960, *Voorhorst* 1962) we have shown, at least if larger groups of patients are considered, that asthma patients have a stronger degree of atopic allergy than patients with vasomotor rhinitis.

In respect to the *individual atopic patient*, however, the problem is more complicated. At the moment we are beginning to realize that a state of hyperreactivity both for the bronchial

tree (*Tiffeneau* 1960) and for the nose (*v. Lier* 1960) is of equal importance. It matters a great deal whether the histamine release, as a consequence of an allergen-reagin reaction, takes place in an otherwise normal or in a chronically diseased hyper-reactive organ. Many circumstances from the patient's former life can render either the nose or the bronchi more hyper-reactive and this will have a considerable influence on the localization of the symptoms in the atopic diseases of the respiratory organs (*Sheldon* 1960).

Nevertheless there must remain the general trend, that the stronger forms of atopy are predominantly found in asthma as a consequence of the quantitatively slighter "allergic load" of the mucous membranes of the bronchial tree.

In *non-atopic asthma and vasomotor rhinitis*, in whom the exogenous allergens are of no importance, this quantitative factor is of course absent.

If this difference in exposure to exogenous allergens has any importance, then it must be demonstrable that vasomotor rhinitis is connected much more closely with asthma in atopic patients than in the non-atopic ones. This is indeed the case!

We have divided into three groups all the new out-patients (409) coming to our Department during the period of April 1960–March 1961 with complaints of vasomotor rhinitis and asthma:

- a) vasomotor rhinitis,
- b) asthma and vasomotor rhinitis,
- c) asthma only.

It was not possible to consider questions such as the ages of onset of both complaints (asthma and rhinitis) or whether they alternated or not. It was not necessary for the symptoms to be present during the whole period of the patient's illness.

A patient who suffered only from asthma and never seriously from vasomotor rhinitis was classified in group c, a patient with vasomotor rhinitis only in group a, the rest in group b. On first consultation it was not necessary for the symptoms to be manifest.

Furthermore the patients were classified as "atopic" if the skin-test to 0.1 % house-dust was positive; otherwise they were considered "non-atopic".

The number of blood eosinophils and the strength of the nasal mucus eosinophilia of the patients under investigation were those obtained during their first consultation.

The group of 409 patients could be subdivided as follows:

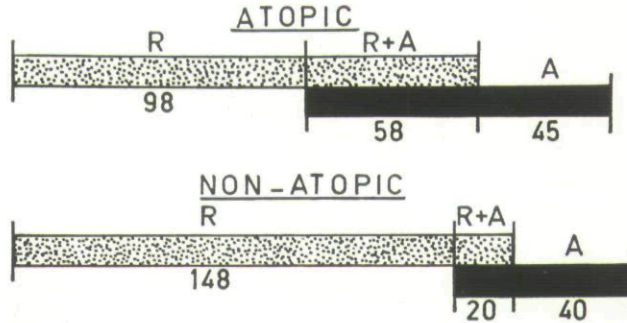


Fig. 1.

TABLE 1

	Atopic	Non-atopic	Total
Vasomotor rhinitis	98	148	246
Vasomotor rhinitis and asthma	58	20	78
Asthma	45	40	85

Fig. 1 and Table 1: Subdivision of 409 patients with vasomotor rhinitis and/or asthma into atopic and non-atopic.

Considering the group of *asthma* patients it appears that atopic patients have in 56.3 % of cases symptoms of vasomotor rhinitis, whereas non-atopic ones have vasomotor rhinitis in 33.3 %. This difference is statistically significant ($p < 0.01$) and it becomes all the more important if we consider, moreover, the number of patients with "vasomotor rhinitis only", of whom the non-atopic ones predominate considerably. This confirms our theoretical considerations; the presence of a rhinitis vasomotoria is an indication of the asthma's being due to an atopic mechanism.

Moreover, it is of interest to see whether the asthma patients with and those without complaints of vasomotor rhinitis are identical in all other respects.

Age-distribution:

It appears (Table 2) that in respect to the age-frequency there is a small difference; the frequency peak in the group of "vasomotor rhinitis and asthma" occurs at 20-29 years;—in that of "asthma" somewhat earlier, at 10-19 years. This difference however is statistically not significant.

TABLE 2
Patients with atopic vasomotor rhinitis and/or atopic asthma divided into ten year groups.

	Vas. rhinitis	Vas. rhinitis and asthma	Asthma
0-9	13	10	8
10-19	23	14	14
20-29	33	16	8
30-39	16	7	8
40-49	9	6	4
50-59	4	4	2
> 60	0	1	1

Sex-distribution:

As can be seen from Table 3, the distribution of asthma with and without rhinitis over both sexes occurred at the same ratio.

A similar finding occurs if we subdivide both sexes into ten year age-groups.

TABLE 3
Sex-distribution of patients with atopic vasomotor rhinitis and/or atopic asthma.

	Males	Females
Vasomotor rhinitis	54	42
Vasomotor rhinitis and asthma	32	26
Asthma	28	17

Atopic skin-reactions:

The atopic skin-reactions (to house-dust) could be divided into strong (to 0.01 % positive) or weak (only to 0.1 % positive).

After statistical analysis it appeared that there were no significant differences in skin-reactions between the two groups of atopic asthma patients.

TABLE 4

Skin-reactions to house-dust (0.1 % = weak; 0.01 % = strong) of patients with atopic asthma with and those without complaints of vasomotor rhinitis.

Skin-reactions	Vas. rhinitis and asthma		Asthma	
	Males	Females	Males	Females
Weak	15	16	9	15
Strong	17	9	19	5

Eosinophil blood cells:

Table 5 and Fig. 2 illustrate a substantial difference in eosinophilia between the atopic vasomotor rhinitis group and

TABLE 5

Blood eosinophilia in patients with atopic or non-atopic vasomotor rhinitis and/or asthma.

	Atopic	Non-atopic
<i>Vasomotor rhinitis</i>		
eos. < 400	51 = 56.7 %	120 = 82.8 %
eos. > 400	39 = 43.3 %	25 = 17.2 %
<i>Vasomotor rhinitis and asthma</i>		
eos. < 400	15 = 28.8 %	12 = 63.2 %
eos. > 400	37 = 71.2 %	1 = 36.8 %
<i>Asthma</i>		
eos. < 400	12 = 27.9 %	29 = 72.5 %
eos. > 400	31 = 72.1 %	11 = 27.5 %

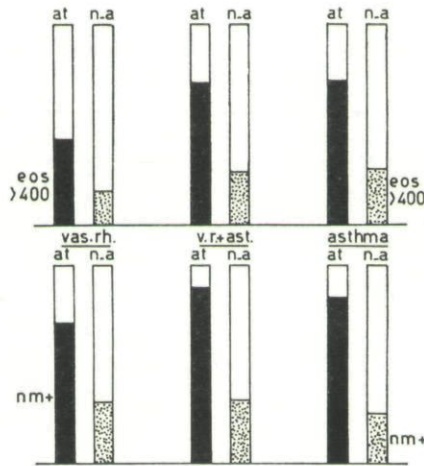


Fig. 2.

Upper part: see Table 5, lower part: see Table 6.

the groups of atopic asthma with and without vasomotor rhinitis. This fact has been discussed by us earlier (*Voorhorst & Vermey-Scheltema 1960*).

Between the patients of the group "atopic asthma and vasomotor rhinitis" and of the group "atopic asthma only" there is no difference in numbers of blood eosinophils.

Eosinophil cells in nasal mucus.

The nasal mucus eosinophilia shows no difference at all in the three clinical groups, whether we consider the atopic or the non-atopic patients. There is however a very striking difference between the atopic and the non-atopic patients. Nasal mucus eosinophilia is a characteristic of atopy!

In conclusion we can say that the *combination* of symptoms of vasomotor rhinitis and asthma is typical of an atopic disease of the respiratory organs. The absence of symptoms of vasomotor rhinitis in patients with atopic asthma, however, is no argument for placing these patients in another clinical group

TABLE 6

Nasal mucus eosinophilia in patients with atopic or non-atopic vasomotor rhinitis and/or asthma.

	Atopic	Non-atopic
<i>Vasomotor rhinitis</i>		
Nasal mucus —	26 = 28.9 %	100 = 69.0 %
Nasal mucus + ...	64 = 71.1 %	45 = 31.9 %
<i>Vasomotor rhinitis and asthma</i>		
Nasal mucus —	6 = 11.5 %	13 = 68.4 %
Nasal mucus + ...	46 = 88.5 %	6 = 31.6 %
<i>Asthma</i>		
Nasal mucus —	7 = 16.3 %	30 = 75.0 %
Nasal mucus + ...	36 = 83.7 %	10 = 25.0 %

Nasal mucus — = eos. < 20 %; Nasal mucus + = eos. > 20 % of all cells.

because in respect to all the other clinical data such as sex-distribution, age of first consultation, skin-reactions to house-dust, eosinophilia of blood and nasal mucus, there is no difference at all between the group "asthma and vasomotor rhinitis" and the group "asthma only". It is very remarkable that the nasal mucus eosinophilia (see Table 6) in asthma patients does not correlate with the presence or absence of nasal complaints. On the one hand this fact is very useful, because the nasal smear is now as valuable a diagnostic aid in asthma with, as in asthma without, vasomotor rhinitis. On the other hand however we must realize that the presence of an atopic reaction (as we may conclude from the appearance of eosinophil leucocytes in the nasal mucus in patients with atopic asthma) is not necessarily followed by nasal complaints. It is therefore very probable that not until other concomitant factors (e.g. hyperreactivity) are present, will patients get symptoms of their atopy.

In respect to the reaction of the eosinophil system in atopic and non-atopic diseases of the respiratory organs, the following scheme summarizes our present views in this respect:

TABLE 7

Scheme of the occurrence of eosinophil leucocytes in atopic and non-atopic diseases of the respiratory tracts.

		Atopic	Non-atopic
Vasomotor rhinitis	{ blood eosinophilia	++	±
	{ nasal mucus	+++	+
Asthma with or without vasomotor rhinitis	{ blood eosinophilia	+++	+
	{ nasal mucus	++++	+

± = about 20%; + = about 30%; ++ = about 40%; +++ = about 60%;
++++ = about 80%.

SUMMARY

A study has been made of the significance of the presence of vasomotor rhinitis in atopic (and non-atopic) asthma patients. It appeared that vasomotor rhinitis occurred much more frequently in patients with atopic asthma than in non-atopic ones. There appeared to be no significant difference in age- or sex-distribution, skin-reactions to house-dust, blood and nasal mucus eosinophilia in patients with atopic asthma either with or without vasomotor rhinitis.

REFERENCES

- Voorhorst, R. & Vermey-Scheltema, G. C.*: Interrelation of rhinitis vasomotoria and asthma, occurring in patients with house-dust-atopy. I. Differences in number of eosinophil cells, and in skin-reactions to a standard house-dust extract. *Acta Allerg.* 15, 130, 1960.
- Varekamp, H. & Voorhorst, R.*: Interrelation of rhinitis vasomotoria and asthma, occurring in patients with house-dust atopy. II. Influence of houses lived in. *Acta Allerg.* 15, 248, 1960.
- Voorhorst, R.*: The interrelations of atopic rhinitis and atopic asthma in: *Basic facts of Allergy*. Stenfert Kroese, Leiden, p. 116-129, 1962.
- Tiffeneau, R.*: Asthma et emphysème. Définitions, mesures, relations. *Int. Arch. Allerg.* 16, 305, 1960.
- Van Lier, L. A. J.*: Een vergelijkende studie over de rhinitis vasomotria allergica en non-allergica. Thesis Leiden, 1960.
- Sherman, W. B.*: Diseases of allergy in: *Cecil and Loeb's, a textbook of medicine*. W. B. Saunders Comp. Philadelphia and London, p. 427, 1960.

This document is a scanned copy of a printed document. No warranty is given about the accuracy of the copy. Users should refer to the original published version of the material.