

Asthma and Allergic Rhinitis in the Same Patients

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This study from Danish general practice gives figures about the simultaneous prevalence of asthma and allergic rhinitis and the order of onset among 7662 patients, who during 1 year consulted for one or both of these diseases. Twenty-eight percent of patients with asthma consulted because they also had allergic rhinitis, and 17% of patients with allergic rhinitis consulted because they also had asthma. Age- and sex-distributions are presented. In 25% of patients with both diseases the onset of both diseases occurred within the same year, while in 35% the onset of asthma occurred first and in 40% allergic rhinitis.

Among patients with both diseases, who did not have onset of both within the same year, more than 75% of them had onset of one disease within 2 years of the other.

Key words: allergic rhinitis; asthma; same patients.

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It is a well-known fact that asthma and allergic rhinitis may occur in the same persons. Some consider the two diseases as different manifestations of the same atopic illness, and in some cases the less serious of them – allergic rhinitis – has been considered a forerunner of the other.

A study of the prevalence of asthma and allergic rhinitis in Danish general practice gave us the opportunity to investigate these problems further. We have analysed data with the aim of determining the number of persons consulting general practice with both diseases, which of them started first, and how many years elapsed from onset of one until onset of the next of the two diseases.

DEFINITIONS

In this study asthma is defined as paroxysmal bouts of dyspnoea of an expiratory type. Allergic rhinitis is defined as paroxysmal sneezing and rhinorrhoea with or without conjunctivitis, and without signs of infection.

PATIENTS AND METHODS

A summary of methods has been published in previous articles about prevalence and consultation rates of asthma (8) and allergic rhinitis (9), and a more detailed description of the methods is in preparation. In 1977–78 153 Danish general practices with 271 general practitioners reported all persons consulting for asthma or allergic rhinitis during a year. The consultation date, sex, diagnosis, and age at onset of disease were recorded. Where age of onset of the diseases was different from the patients' present age this difference was stated in whole years.

RESULTS

All patients who consulted at least once during the study year because of asthma and/or allergic rhinitis are shown in Table 1. The total number of patients suffering from both asthma or allergic rhinitis can be calculated by adding figures from sections A and C or B and C of

Table 1

Patients consulting general practice because of asthma and/or allergic rhinitis during 1 year. Distribution by age, sex and diagnosis

Age (years)	A Asthma alone			B Allergic rhinitis alone			C Both asthma and allergic rhinitis			Total		
	M	F	M+F	M	F	M+F	M	F	M+F	M	F	M+F
0-4	95	52	147	28	13	41	14	4	18	137	69	206
5-9	162	85	247	198	78	276	64	27	91	424	190	614
10-14	177	68	245	452	237	729	118	60	178	787	365	1152
15-19	75	72	147	421	270	691	80	63	143	576	405	981
20-24	45	46	91	292	234	526	44	46	90	381	326	707
25-29	45	56	101	247	225	472	39	31	70	331	312	643
30-34	59	86	145	269	306	575	42	47	89	370	439	809
35-39	42	79	121	195	235	430	31	41	72	268	355	623
40-44	57	79	136	117	120	237	19	30	49	193	229	422
45-49	58	81	139	50	71	121	10	22	32	118	174	292
50-54	59	100	159	41	61	102	18	13	31	118	174	292
55-59	80	98	178	25	46	71	10	10	20	115	154	269
60-64	83	61	144	27	31	58	5	11	16	115	103	218
65-69	94	58	152	13	18	31	4	6	10	111	82	193
70-74	73	42	115	5	18	23	1	3	4	79	63	142
75-79	20	23	43	4	6	10	2	1	3	26	30	56
80-84	13	12	25	0	2	2	3	2	5	16	16	32
85-89	1	5	6	0	0	0	0	1	1	1	6	7
90-	1	2	3	1	0	1	0	0	0	2	2	4
Total	1239	1105	2344	2425	1971	4396	504	418	922	4168	3494	7662

this table. From Table 1 figures can be calculated showing the percentages of patients suffering from asthma or allergic rhinitis, who has both conditions i.e.: percentage of all asthma patients who had asthma and allergic rhinitis = $\frac{100 C}{A + C}$; percentage of all allergic rhinitis patients who had both asthma and allergic rhinitis = $\frac{100 C}{B + C}$. These percentages are listed in

Tables 2 and 3. Table 2 shows that 28% of all asthmatics also consulted because of allergic rhinitis during the year. The highest percentages (about 50%) occurred at ages 10-29, and was above 25% until the age of 45. For older patients the figures should not be considered reliable because of wide confidence limits.

Table 3 shows the number of patients who consulted for both allergic rhinitis and asthma

as a percentage of all allergic rhinitis patients. Seventeen percent of all allergic rhinitis patients did also consult because of asthma. Among both sexes there seemed to be increased consulting for both diseases among persons under 20 and between 40 and 69 years of age. Figures concerning older patients are unreliable.

In one fourth of all patients the onset of both diseases occurred in the same year. In 35% of the patients asthma occurred first, and 40% started with allergic rhinitis (Table 4).

The majority of patients with both diseases started one of the diseases within 1 or 2 years after onset of the other. Table 5 shows that 87% of asthmatics, who subsequently developed allergic rhinitis, did so within 2 years, and Table 6 shows that 75% of patients with allergic rhinitis who subsequently developed asthma, did so within 2 years.

Table 2

Percentage of asthma patients who also consulted general practice because of allergic rhinitis during 1 year. Distribution by age and sex

Age (years)	Males <i>n</i> = 504 (%)	Females <i>n</i> = 418 (%)	Total <i>n</i> = 922 (%)
0-4	13 (7-21)	7 (2-17)	11 (7-17)
5-9	28 (22-35)	24 (16-33)	27 (22-32)
10-14	40 (34-46)	47 (38-56)	42 (37-47)
15-19	52 (43-60)	47 (38-55)	49 (44-55)
20-24	49 (39-60)	50 (39-61)	50 (42-57)
25-29	46 (36-58)	36 (26-46)	41 (34-49)
30-34	42 (32-52)	35 (27-44)	38 (32-45)
35-39	43 (31-55)	34 (26-43)	37 (31-45)
40-44	25 (16-36)	28 (20-37)	27 (20-34)
45-49	15 (7-25)	21 (14-30)	19 (13-25)
50-54	23 (14-34)	12 (6-19)	16 (11-22)
55-59	11 (5-20)	9 (5-17)	10 (6-15)
60-64	6 (2-13)	15 (8-26)	10 (6-16)
65-69	4 (1-10)	9 (4-20)	6 (3-11)
70-74	1 (0-7)	7 (1-18)	3 (1-8)
75-79	9 (1-29)	4 (0-21)	7 (1-18)
80-84	19 (4-45)	14 (2-43)	17 (6-34)
85-89	0 (0-98)	17 (0-64)	14 (0-58)
90+	0 (0-98)	0 (0-84)	0 (0-70)
Total	29 (26-31)	27 (25-30)	28 (27-30)

95% confidence limits in brackets.

DISCUSSION

Several studies have been made of the simultaneous occurrence of asthma and allergic rhinitis/hay fever. From Iowa (10) it has been reported that 78% of patients with extrinsic asthma had nasal symptoms. In a London group practice 19% of 314 asthmatics had also hay fever (2). In 121 asthmatic children 10-15 years old in Scotland hay fever occurred among 29% (boys 26% and girls 35%) (3). Among college students two studies have shown that allergic rhinitis occurred in 56 and 57% of asthmatics (1, 7). The first mentioned study gave figures for males as 53 and for females 66% (1). Although these figures deviate considerably, the general tendency of a high prevalence of allergic rhinitis/hay fever among asthmatics is evident. This is particular-

Table 3

Percentage of allergic rhinitis patients who also consulted general practice because of asthma during 1 year. Distribution by age and sex

Age (years)	Males <i>n</i> = 504 (%)	Females <i>n</i> = 418 (%)	Total <i>n</i> = 922 (%)
0-4	33 (20-50)	24 (7-50)	31 (19-44)
5-9	24 (19-30)	26 (18-35)	25 (20-30)
10-14	21 (17-24)	20 (16-25)	20 (17-22)
15-19	16 (13-19)	19 (15-24)	17 (15-20)
20-24	13 (10-17)	16 (12-21)	15 (12-18)
25-29	14 (10-18)	12 (8-17)	13 (10-16)
30-34	14 (10-18)	13 (10-17)	13 (11-16)
35-39	14 (10-19)	15 (11-20)	14 (11-18)
40-44	14 (9-21)	20 (14-27)	17 (13-22)
45-49	17 (8-29)	24 (15-34)	21 (15-28)
50-54	31 (19-44)	18 (10-28)	23 (16-31)
55-59	29 (15-46)	18 (9-30)	22 (14-32)
60-64	16 (5-33)	26 (14-42)	22 (13-33)
65-69	24 (7-50)	25 (10-47)	24 (12-40)
70-74	17 (0-64)	5 (3-36)	15 (4-34)
75-79	33 (4-78)	14 (0-58)	23 (5-54)
80-84	100 (29-100)	50 (7-93)	71 (29-96)
85-89	- -	100 -	100 -
90+	- -	- -	- -
Total	17 (16-19)	17 (16-19)	17 (16-18)

95% confidence limits in brackets.

ly applicable in the age group represented by students. The figures from the two studies (1, 7) concerning these are very much in accord with the present study.

Studies of the prevalence of asthma among allergic rhinitis-patients are reported less often. Among college students (1, 7) 19% of allergic rhinitis patients also had asthma. One of the studies (1) gave figures for males and females of 18 and 19% respectively, which are a little higher than those found in the present study.

With regard to order of onset of the two diseases it has been found that among students six (43%) out of 14 had allergic rhinitis first, three (21%) had asthma first and five (36%) had both diseases at the same time (6). Among patients at a Student's Health Service 27 of 42 patients (64%) had rhinitis first, six (14%) asthma first and nine (21%) both diseases at

Table 4

Patients with asthma and allergic rhinitis distributed by order of first onset

Diagnosis	No. of patients	
	Abs.	Percent
Asthma first	321	35
Allergic rhinitis first	370	40
Onset in same year	231	25
Total	922	100

Table 5

Duration from first onset of asthma until first onset of allergic rhinitis among patients with both diseases and asthma occurring first

Duration (years)	No. of patients	
	Abs.	Percent
> 1-<2	279	87
2-5	14	4
6-10	11	3
11-15	8	2
16-20	4	1
21-30	3	1
31+	2	1
Total	321	99

Table 6

Duration from first onset of allergic rhinitis until first onset of asthma among patients with both diseases and allergic rhinitis occurring first

Duration (years)	No. of patients	
	Abs.	Percent
> 1-<2	279	75
2-5	44	12
6-10	20	5
11-15	11	3
16-20	7	2
21-30	4	1
31+	5	1
Total	370	99

the same time (6). In a study of school children at 8th and 12th grades (about age 13-17) it was found that among a total of 78 children with both diseases 23% had hay fever first (more than 1 year before), 41% had asthma first (more than 1 year before), and 36% had onset of both diseases within the same year (1). A study of 11-year-old asthmatic children showed that 44.9% had had recurrent hay fever/allergic rhinitis within 1 year before (7).

The duration of one disease before onset of the other has been sparsely studied. In one study it was found that only 3.4% of 528 asthmatic children had had hay fever for more than 1 year before asthma (4). And in the Michigan general population only 5-10% of asthmatics gave a history of nasal symptoms for more than a year before asthma began (10). A study from Finland showed that recurrent cough and sneezing and wheezy breath preceded or had their beginning in the same year as asthma in 94.1 and 94.7% respectively (5).

The main results of the present study seem to confirm the general tendency cited in these references. The percentage of patients with allergic rhinitis among all patients with asthma is 28, and the reports about children and students support the age-related tendency to high incidence in younger age groups. The percentage of asthma among all patients with allergic rhinitis is less (17%) which confirms the main findings of previous studies.

The order of onset among patients with both diseases in this study differs little from other reports. A quarter of the patients start within the same year, and among the rest one half start with asthma and one half with allergic rhinitis.

Most cases with both diseases start within 2 years, indicating a common aetiology, and casting doubt on the feasibility of preventing allergic rhinitis from developing into asthma. The short interval between the onset of the two diseases in the same individual strongly indicates that both are manifestations of the same, simultaneously elicited reaction of the respiratory system.

Some reservations about the results of this study of patients consulting in general practice should be stated. Some threshold of severity

must be passed before advice is sought. This threshold may be different for the two diseases and within each patient group, and may therefore not reflect accurately what occurs in the general population or, after passing the next threshold, in specialised clinics or hospitals. Information about the onset of disease is based upon memory, and onset, being gradual, in itself may be difficult to determine. So the figures about onset should be taken with a grain of salt.

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REFERENCES

1. Arsdel, P. P. & Motulsky, A. G.: Frequency and heritability of asthma and allergic rhinitis in college students. *Acta Genet.* 9, 101-114, 1959.
2. Blair, H.: The incidence of asthma, hay fever and infantile eczema in an East London group practice of 9145 patients. *Clin. Allergy* 4, 389-399, 1974.
3. Dawson, B., Horobin, G., Illsley, R. & Mitchell, R.: A survey of childhood asthma in Aberdeen. *Lancet* I, 827-830, 1969.
4. Freeman, G. L. & Johnson, S.: Allergic diseases in adolescents. *Am. J. Dis. Child.* 107, 549-560, 1964.
5. Koivikko, A.: Childhood asthma in Finland. *Acta Allergol.* 29, 30-72, 1974.
6. Maternowski, C. J. & Mathews, K. P.: The prevalence of ragweed pollinosis in foreign and native students at a midwestern university and its implications concerning methods for determining the inheritance of atopy. *J. Allergy* 33, 130-140, 1962.
7. Peckham, C. & Butler, N.: A national study of asthma in childhood. *J. Epidemiol. Commun. Health* 32, 79-85, 1978.
8. Pedersen, P. A. & Weeke, E. R.: Asthma in Danish general practice. *Allergy* 36, 175-181, 1981.
9. Pedersen, P. A. & Weeke, E. R.: Allergic rhinitis in Danish general practice. *Allergy* 36, 375-379, 1981.
10. Smith, I. M.: Epidemiology and natural history of asthma, allergic rhinitis and atopic dermatitis (eczema). In Middleton, E., Reed, C. E. & Ellis, E. F. (eds.): *Allergy, principles and practice*, Vol. II. The C. V. Mosby Co., Saint Louis, 1978.

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