

From the Pediatric Clinic of Karolinska Institutet at Karolinska Sjukhuset,
Stockholm and the Allergy Department, Sach's Children's Hospital,
Stockholm, Sweden.

OCCURRENCE OF ALLERGIC RHINITIS AMONG SCHOOLCHILDREN¹

By

INGA ENGSTRÖM, SVEN KRAEPELIEN &
KERSTIN LINNEROTH-ELZVIK

Children with allergic diseases represent a considerable proportion of the patients at children's hospitals and on the roll of practising physicians. *Crook et al.* (2) reported figures around 10 per cent. *Rapaport et al.* (12), who made a pilot survey of the incidence of allergy in American children gave the figure of 23.7 per cent. In a similar study in Finland (10) the figure for allergy among children is considerably lower. As for the incidence of the different types of allergic diseases bronchial asthma has been of greatest interest and the figures reported vary between 0.5-5.0 per cent (3, 5, 6, 9, 10, 11). The occurrence of allergic rhinitis, however, has not been studied in the same extent. *Peltonen et al.* (10) reports a figure of 0.4 per cent for allergic rhinitis among Finnish schoolchildren, and *Glaser et al.* (8) gives about 5 per cent for ragweed pollinosis with allergic rhinitis as main symptom in American schoolchildren. There are similar discrepancies between the figures of allergic rhinitis in adults (1, 14).

In view of the varying reports we have attempted to chart the occurrence of allergic rhinitis among Swedish children. The study is based on a questionnaire addressed to the parents of elementary schoolchildren in Stockholm.

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MATERIAL

Six Stockholm elementary schools were chosen, numbering 6876 pupils (8.7 per cent of all elementary schoolchildren in Stockholm). The schools were selected on the basis of the distribution of children in Stockholm, including one school in the centre of the town and five in the suburbs. Through the agency of the school nurse and the class teacher the pupils' parents received a questionnaire asking whether the child suffered from hay fever or other allergic catarrh, description of symptoms, age at onset, seasonal variations, suspected course, and treatment given; also whether the child had had any other allergic disease such as asthma, eczema or urticaria.

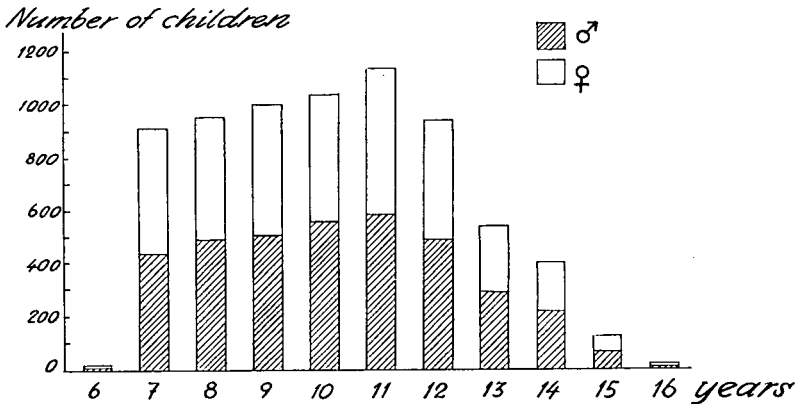


Fig. 1.

Age and sex distribution of the children studied.

Replies were received covering 6714 children (3452 boys and 3262 girls), representing 97.6 per cent of the total number questioned. The age distribution is shown in Fig. 1.

In all cases in which the reply suggested the possibility of allergic rhinitis, the parents were personally contacted by us and a more detailed history was compiled. Forty-one of the children have had a thorough allergological examination previous to or in conjunction with the present study.

RESULTS

The children for whom positive replies were received were classified in three groups. Group I included cases of definite allergic rhinitis with a manifestly seasonal history. Thus this group comprised children suffering mainly from pollinosis. Group II included cases of anamnesticly definite allergic rhinitis without a directly seasonal character, caused by other allergens than pollen. This group therefore included children who had catarrhal symptoms following repeated contact with a specific allergen or allergens, especially animal epithelium. The diagnosis of children in Groups I and II was in certain cases verified by allergological examination. Group III included cases of probable allergic rhinitis. These children had had long-lasting and repeated rhinitis combined with conjunctivitis or other allergic symptoms, but without indication of a directly suspected allergen. The group included children who had received antiallergic treatment by other physicians on account of catarrhal symptoms, but whose history did not permit their allocation to Group I or II. The material in the several groups is listed in Table 1. Group I (definite seasonal hay fever) comprised 98 cases (1.5 per cent of all children studied). Cases with definite allergic rhinitis (Groups I and II) numbered 119 (1.8 per cent of all children studied). Including the 39 cases of probable allergic rhinitis (Group III) the total figure for allergic rhinitis was 2.4 per cent.

The subsequent analysis was concerned solely with the definitely seasonal allergies in Group I, since the numbers of children in Groups II and III were too small for statistical analysis. The incidence of seasonal hay fever was 2.1 per cent among boys and 0.8 per cent among girls, a significant difference between the sexes ($0.05 > P > 0.01$). Thus about three-quarters of the cases with seasonal hay fever in this material were boys. Having regard to age grouping (Table 2) the tendency is towards higher incidence with rising age in boys, but not in girls. An analysis of the age of onset shows that, in about one-third of cases, the seasonal hay fever started before

the age of 4 years, and in about three-fifth of cases before the age of 7 years.

Comparison between the different schools shows a significantly higher incidence of seasonal hay fever for boys in the suburban areas than in the central school ($0.05 > P > 0.01$).

In half of the cases seasonal hay fever occurs as an isolated symptom, and in other cases in combination with asthma and/or allergic skin manifestations.

TABLE 1

The frequency of allergic rhinitis classified in different groups (see text).

Total material		Group I				Group II				Group III			
♂	♀	♂		♀		♂		♀		♂		♀	
No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
3452	3262	73	2.1	25	0.8	6	0.2	15	0.5	21	0.6	18	0.6
6714		98 or 1.5 %				21 or 0.3 %				39 or 0.6 %			

TABLE 2

The frequency of seasonal hay fever in different age groups.

Age in years	Total material		Group I					
	♂	♀	♂		♀			
	No.	%	No.	%	No.	%	No.	%
< 6	9	11	—	—	—	—	—	—
7-9	1368	1358	21	1.5	7	0.5	—	—
10-12	1553	1420	37	2.4	14	1.0	—	—
13-15	518	466	15	2.9	4	0.9	—	—
> 15	4	7	—	—	—	—	—	—
	6714		73	2.1	25	0.8		

DISCUSSION

Allergic rhinitis is a symptom which children and parents do not always conceive as a disease per se, so that a doctor is only consulted if the symptoms become pronounced or are

combined with other more alarming allergic manifestations. This may be one reason for the great variation in the figures reported in the literature. To get an idea of the incidence of allergic rhinitis we therefore decided on the questionnaire method, concentrating on the symptom itself, so as to obtain as representative data as possible.

The results show that 1.8 per cent of the total material has a definite allergic rhinitis. The absolute incidence is probably higher, even if the figure 2.4 per cent, which includes cases of probable allergic rhinitis, cannot be established with certainty. The analysis of the causative allergen revealed a clear preponderance of hay fever, which must be mostly caused by pollen. This is probably a true state of affairs, but may be associated with the difficulty of establishing allergic rhinitis of other origin solely from the guidance of case histories.

Sherman & Kessler (12) state that allergic rhinitis in children exhibits no difference between the sexes, while *Glaser* (7) reports the same sex differentiation as in bronchial asthma, that is a preponderance of boys. In our material hay fever is much more common among boys, who represent three-quarters of all cases. This is a somewhat higher figure than that usually encountered in asthmatic children. (4).

It is a generally held opinion that allergic rhinitis in children seldom appears before the age of 4-5 years (13). This is not corroborated by our study, in which about one-third of hay fevers started before 4 years of age and more than half before 7 years, figures that are about the same magnitude as those reported by *Glaser* (7).

The frequent combination of allergic rhinitis with other allergic manifestations is clearly evident from this material, about one-half of cases being combined with asthma and/or allergic skin manifestations.

The difference in the figures of hay fever between the city and the suburbs is probably due to the greater abundance of vegetation in the outlying residential areas.

The incidence arrived at in this study—1.8 per cent—implies that 1300 to 1400 elementary schoolchildren in Stockholm

suffer from allergic rhinitis. If the same figure is accepted for the country as a whole, the total number of Swedish school-children with allergic rhinitis would be 17-18000. This must be an absolute minimum, however, having regard both to the manner of procuring the primary data and to the likelihood of greater possibilities for sensitization in country districts. And, of course the total number of children with allergic rhinitis is very much higher, since preschool children are not included in these calculations.

SUMMARY

The incidence of allergic rhinitis among elementary school-children has been investigated by a questionnaire method, covering 6714 children (3452 boys and 3262 girls).

Seasonal allergic rhinitis (hay fever) was established in 1.5 per cent. Including other definite, but non-seasonal, allergic rhinitis, the total incidence was 1.8 per cent.

Seasonal hay fever occurs mainly in boys (three-quarters of all cases), and in one-third of all cases it starts before the age of 4 years.

Seasonal hay fever is more common in the suburb than in the inner part of the city, probably because of the difference in possibilities for sensitization.

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