

Urticaria in Children

Retrospective Evaluation and Follow-Up

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A retrospective study supplemented with follow-up was carried out in 163 children, aged 6 months to 16 years, who were hospitalized because of acute, recurrent or chronic urticaria in 1976-1980. Etiologic agents were identified in 55% of cases. Physical factors were the commonest causes, especially in cases of chronic urticaria, while infections predominated in acute urticaria. 81% of the children participated in the follow-up study. Follow-up for a year or more revealed that 53% of the children had become symptom-free, 36% still had symptoms but less frequently and in 11% urticaria was unresolved. The results indicate that the etiologic factors in childhood urticaria are similar to those found in adults and that prognosis is favorable, particularly when the etiology is established.

Key words: childhood urticaria; etiology of urticaria; prognosis of urticaria.

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Urticaria and angioedema are common both in children and in adults. It has been estimated that nearly 20% of the population suffers from urticaria at some time in life (6). Acute urticaria has been reported to be the commonest type in children, whereas recurrent and chronic urticaria are more frequent in adults than in children (10, 11). In previous studies of childhood urticaria, etiologic factors have been identified in varying percentages of cases (4). For chronic urticaria figures range from 15 to 87%, indicating that causative associations between urticaria and suspected underlying or precipitating factors are difficult to confirm. The aim of the present study was to determine the main causes of childhood urticaria in hospitalized patients and to throw light on the prognosis by following the course of their illness.

PATIENTS AND METHODS

Clinical study

The study was carried out in 163 children (72 boys and 81 girls) aged 6 months to 16 years,

who were admitted to the hospital because of urticaria in 1976-1980.

Urticaria was considered acute if symptoms had been present for less than 2 months, chronic if symptoms had persisted over 2 months, and recurrent if the recurring episodes of urticaria were of shorter duration than the symptom-free periods between episodes. The distribution of the children by duration of symptoms is presented in Table 1.

Table 1
Distribution of patients by subgroups of urticaria and the frequencies of known etiologic factors

Diagnosis	No. patients	Known etiology %
AU	40	68
RU	68	40
CHU	55	65
Total	163	55

AU = acute urticaria; RU = recurrent urticaria; CHU = chronic urticaria.

When taking the history of the children, we paid particular attention to prior infections and previously used drugs. Basic laboratory tests included examination of blood values, SR, urine, and stool sample for search for intestinal parasites. In cases of angioedema serum complement C₃, C₄ and the inhibitor of the activated first component of the complement were studied. If infection was suspected, bacteriological culture of throat specimens and X-ray examination of teeth, sinuses and lungs were carried out.

Skin tests were performed by the prick method with the following allergens: house dust, house dust mite, cat, dog, birch, alder, mugwort, and 4 grasses common in Finland (ALK, Copenhagen).

Allergy to fruits and vegetables was tested with raw vegetable and fruit flesh using the scratch-chamber technique as described by Lahti & Hannuksela (3). Specific IgE antibodies to birch, timothy, mugwort, and house dust were assayed by RAST (Phadebas RAST, Pharmacia, Uppsala).

Physical tests for urticaria included the dermatographism test (stroking of the skin), cold, warm, pressure and sweating challenge tests. In the cold challenge test, a glass tube filled with ice cubes was placed on the inside of the lower arm for 10 min, and in the warm stimulus test the lower arm was kept in warm water (42°C) for 10 min. A belt with two suspended weights was placed on the leg to test reactions to pressure, and a cycle ergometer was used to provoke sweating in the sweating challenge test.

Intolerance to acetylsalicylic acid, sodium benzoate, and tartrazine was examined by oral challenge tests. During the provocation period the patient was on a diet from which all food additives and also the naturally occurring salicylates and benzoic acid derivatives were eliminated. The challenge was started with a small amount of the substance to be tested, and if no reaction occurred within 24 h, a larger dose was given. In food challenge the test doses were adjusted individually, taking the age of the patient into consideration.

Follow-up study

A new contact was made with the 163 patients, who were retrospectively evaluated. 22 of them were in out-patient control, the remaining 144 received a questionnaire with questions about the course of the illness, use of antihistamines, and possible experiences of diets. 110 replied, thus, in all, 110 + 22 = 132 contributed to the study. The follow-up time was 3.8 years (mean) with a range from 1 to 6.5 years.

RESULTS

Clinical study

The etiology could be established or was strongly suspected in 55% of the children with urticaria (Table 1). The causal factor was traced almost as frequently in the cases of acute as in the cases of chronic urticaria but less often in those of the recurrent subgroup. Physical factors, usually cold, were most frequently identified as the cause of symptoms, followed by food additives and acetylsalicylic acid (Table 2). Urticaria provoked by these was mostly classified as chronic. Foods and infections were

Table 2
Causes of urticaria in different subgroups

Etiology	No. patients			
	AU	RU	CHU	Total
Physical factors	3	6	14	23
Food additives/ASA	3	8	10	21
Foods	6	8	5	19
Infections	11	3	4	18
Parasites	3	1	1	5
Drugs (penicillin)	1			1
Insects		1		1
Combinations			2*	2*
Unknown	13	41	19	73
Total	40	68	55	163

* Food additives and dermatographism 1.

Food additives and cold 1.

AU = acute urticaria; RU = recurrent urticaria; CHU = chronic urticaria.

almost equally often involved. Various infections, most frequently acute respiratory ones, were the main triggers of acute urticaria.

Follow-up study

During the follow-up period 53% of the patients had become symptom-free. 30% of the patients primarily classified as having acute urticaria had become chronic. The frequency of symptom-free patients was highest in the group of acute urticaria, while corresponding figures for recurrent and chronic urticaria were almost equal (Table 3).

Table 3

The outcome of patients with urticaria by different subgroups. Mean follow-up time 3.8 years

Diagnosis	No. patients followed	Symptom-free during the follow-up period	
		No. patients	%
AU	33	23	70
RU	53	24	45
CHU	46	23	50
Total	132	70	53

AU = acute urticaria; RU = recurrent urticaria; CHU = chronic urticaria.

Table 4

Proportions of symptom-free patients grouped according to etiological factors. Mean follow-up time 3.8 years

Etiology	No. patients
Parasites	5/5
Insects	1/1
Drugs (penicillin)	1/1
Infections	13/16
Foods	9/18
Food additives/ASA	8/16
Physical factors	9/21
Combinations	1/2
Unknown	23/52
Total	70/132

The prognosis of urticaria of known etiology seemed to be dependent on the possibility to avoid the causal factor as indicated in Table 4. However, about half of the patients with urticaria of unknown etiology had also remained symptom-free during the follow-up period.

DISCUSSION

The etiology of urticaria, especially of the chronic type, is generally considered a *crux medicorum*. Obviously, variations in the rates of successful diagnoses reported in the literature are partly attributable to differences in the criteria for identification of etiologic factors. In a report on adult urticaria by Wütrich & Häcki-Herrmann (13) the etiologic factor was revealed in 28% of cases, and in a study by Champion et al. (1) in 21%. In the present series of childhood urticaria, studied in in-patients, the etiology could be established in 55%: in 68% of the patients with acute urticaria, in 40% of those with recurrent and in 65% of the patients with chronic urticaria. Harris et al. (4), on the other hand, found that the cause could be identified or suspected in only 15% of the children with chronic urticaria. The greater success in establishing the cause of urticaria in the present series as compared with the three above-mentioned reports may depend on the fact that all the children were hospitalized in a special clinic for allergic diseases and urticaria, where critical challenge tests could be performed.

Physical factors, usually cold, were the most frequently identified causes of urticaria in the present series, accounting for 14% of cases. This is in agreement with other studies (4, 9, 13). The high incidence of physical urticaria in many series is probably due to the fact that these factors can easily be checked by challenge tests or deduced from the past history of the patients.

Food additives including azo-dyes and sodium benzoate/acetylsalicylic acid triggered urticaria in 13% of the children in our series. The corresponding frequency for adults examined at the same clinic was 23% (5). Much higher frequencies have been reported (7) but also lower ones (13).

Foods were responsible for urticaria in 12% of the children in the present study. Sehgal & Rege (9) reported a frequency of 19.6% in series comprising both children and adults. The foods most often causing urticaria were fish, vegetables, eggs, and coconut oil. In our series milk, vegetables, and fish were most frequently implicated.

Infections were associated with urticaria in 11% of the present children with urticaria. Acute viral respiratory infections were the commonest, but there were also some cases of streptococcal tonsillitis and acute gastroenteritis and a few others. The urticaria disappeared in these patients soon after resolution of the infection. Halpern found an association with an infectious disease in 26% of children with chronic urticaria (2).

Follow-up for a year or more revealed that 53% of the children had experienced complete resolution, 36% had improved and in 11% urticaria was unresolved. Two-thirds of the children with acute urticaria remained symptom-free, urticaria becoming chronic in the remaining third of cases. Resolution had occurred in about 50% of the children with recurrent or chronic urticaria. Our observations agree with those of Harris et al. (4), who found that 58% of children with chronic urticaria became symptom-free in 6 months or more. Smith et al. (12) reported complete resolution of chronic urticaria and angioedema in 52% of children and adults followed for 6 months or more. In another follow-up study of adults with chronic urticaria 65% of patients were cured, 52% resolved spontaneously and 13% as a result of elimination diets (8). In this study the follow-up period was exceptionally long (mean 82 months), which may account for the fairly high frequency of resolution.

The present study indicates that causes of childhood urticaria are fairly similar to those established in adults. Urticaria in association with an acute infectious disease seemed to be rather common in children. The outcome of patients was not much better when the etiologic agent was detected, as also many of the children in whom the cause was not identified had become symptom-free. Childhood urticaria is

not characterized by specific features and is a self-limited disease.

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