Urticaria in a Family Practice

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A review of the charts of 79 patients with urticaria was conducted in a residency-based family practice center. All patients seen with urticaria in 7 years who were identified by the practice-data retrieval system were included in the review. The annual incidence of urticaria was 0.27 percent. Female patients predominated (76 percent), and 70 percent of the cases lasted less than 6 weeks. A personal history of atopy was more common in acute urticaria than in urticaria lasting longer than 6 weeks ($P < .05$). No causes were identified in 54 percent of the cases. Association with zomepirac and symptomatic dermographism were each noted in three cases. Diagnostic tests were performed in 17 percent of cases, and consultation or referral occurred in 15 percent. Treatment usually included antihistamines (89 percent).

The coded diagnosis was judged by the chart reviewers to be incorrect or inadequately supported in 28 of the 108 charts (26 percent) coded urticaria. In 25 charts coded for other skin disorders, three cases (12 percent) of urticaria were noted by the chart reviewers. Coding errors involving digit transposition were noted in three of 1,044 cases. Diagnostic error, incorrect coding by nonphysicians or by physicians not familiar with the coding system, or even clerical error may be a significant problem in this type of study.

Urticaria is a common problem in family practice that is frequently managed without consultation or referral. It has been studied extensively from the perspective of specialists in dermatology and immunology. From these viewpoints much has been learned about the epidemiology, natural history, and clinical management of urticaria.[1-6] This paper defines these issues from the standpoint of the family physician, and points out a number of problems involved in a chart review-incidence study within a primary care setting. These problems include issues relating to clinical

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diagnosis and the use of data recording and retrieval systems.

Methods

This study of urticaria involved patients and physicians of the University of Cincinnati Family Practice Center. This large group-teaching practice serves the Cincinnati area, an urban community of approximately one million residents. Physicians in this group included primary care faculty physicians (currently numbering 11) and family practice residents (currently numbering 36) practicing under the supervision of the faculty physicians.

During the period covered by the study (1976 to 1983), the patient population registered with the practice grew from zero to approximately 20,000. However, over the last two years of the study (August 1, 1981 to July 31, 1983) the number of patients in the practice was relatively stable. During this period 9,082 individual patients were seen at least once, of whom 62 percent were women. The age distribution was 17 percent under 17 years, 16 percent aged between 17 and 24 years, 41 percent aged between 25 and 44 years, 15 percent aged between 45 and 64 years, 10 percent aged over 64 years, and 1 percent unspecified (age not entered into the computerized data base). The practice population or denominator was determined by using the correction factor method, taking into account age- and sex-specific characteristics as described by Cherkin et al.[7] Annualized patient office visits for this period were 19,458, but inpatient, home, and nursing home visits (included in this study) raised the number to 24,944.

The study consisted of a chart review conducted by the authors in late August 1983, covering the period from the opening of the practice in January 1976 until July 31, 1983. During that time, a data recording and retrieval system was maintained in the practice. Until 1981 this system consisted of an E-book using the International Classification of Health Problems in Primary Care, first[8] or second[9] edition (ICHPPC-1 or ICHPPC-2), disease codes. After 1981 a computer program using the International Classification of Diseases—9th Revision-Clinical Modification[10] (ICD-9-CM) disease codes was used. Clinical data were entered into the system by specially trained ancillary personnel using codes based on diagnoses recorded on encounter forms by the physician seeing the patient.

Charts selected for review were obtained from the data retrieval systems based on the ICD-9-CM codes for urticaria and other conditions (Table 1). A number of skin conditions were included because they were similar to urticaria and therefore possibly misdiagnosed or miscoded. Because digit transposition could result from key punching error, a code number considered a likely candidate for digit transposition was included.

The charts of all patients identified as having urticaria were reviewed to determine the following information: validity of diagnosis, patient age, patient sex, duration of problem, family history of urticaria, history of atopy, cause of urticaria, number of visits for urticaria, diagnostic tests performed, test for dermographism, treatment, and consultation or referral.

The diagnosis of urticaria made by a physician was accepted by the chart reviewer except when there was a description of skin lesions inconsistent with urticaria. As the basis for testing the validity of the diagnosis, the following definition of urticaria was used: "transient, edematous, lightly erythematous papules or wheals, often with central clearing."[4]

The duration of urticaria was based on the physicians's statement of duration and follow-up information recorded in the chart. Urticaria was described as acute if it lasted less than 6 weeks. Recurrent acute urticaria, occurring over a period of 6 weeks or more, was considered chronic. When the history contained no mention of duration of symptoms, the duration was listed as "unspecified." In cases of acute urticaria the inference was made that the problem did not persist or recur if the chart did not indicate any further patient complaint of the problem. The difference-of-proportions test was used to determine whether the predominance of female patients with urticaria was statistically different from the practice population sex ratio.

Personal and family history of atopy were de-

termined by review of the entire data base recorded in the chart as well as from the information recorded for the specific visit. The Fisher's exact test was used to calculate the probability of an association between atopy and the duration of urticaria.

The determination of etiologic diagnosis was based on the final opinion of the physician (and consultant, when applicable) recorded in the chart, unless the reviewers concluded that information in the chart was at variance with the diagnosis. In some cases, two or more possible causes were listed by the physician, and each was accepted.

Decisions regarding the number of visits and diagnostic tests made were based on the judgment of the reviewer that they occurred at least in part for the purpose of diagnosis or treatment of urticaria. Treatment categories included systemic or topical medications prescribed specifically by the physician for urticaria, but not those judged by the reviewer to have been given for coincident allied conditions such as allergic rhinitis or asthma. Consultation or referral was judged to have occurred only when the chart indicated that the family physician requested it.

Results

Seventy-nine patients with urticaria (Table 1) were identified over the seven-year period of chart review. Calculating the incidence of urticaria over this period would be difficult because of the rapid growth of the practice population. During the last two years of the study, August 1, 1981, to July 31, 1983, 57 patients presented to the practice with urticaria for the first time. The practice denominator was calculated at 10,477.79.* Accordingly the annual incidence of urticaria was 0.27 percent for the last two years of the study.

Table 1 shows data relating chart review diagnosis to the diagnosis coded in the data retrieval system. Of 108 charts coded 708 (urticaria, and in ICHPPC-1, urticaria and angioedema), the coded diagnosis was judged correct in 80 patients (74 percent; 76 urticaria and 4 angioedema) and incorrect in 28 (26 percent). The 28 charts for which the coded diagnosis was not judged correct included 1 in which the physician's diagnosis seemed incorrect, 8 in which the chart information was deemed inadequate to support the diagnosis of urticaria, and 19 in which an error in coding had occurred. Allergic dermatoses, erythema multiforme, and angioedema (after 1979) were the diagnoses most frequently miscoded as urticaria. In 25 charts coded for skin disorders other than urticaria, three cases (12 percent) of urticaria were noted. In 936 charts coded 780, a number involving a digit transposition from 708, no cases of urticaria were noted. In 108 charts coded 708, 3 cases of digit transposition were noted. Thus, in a total of 1,044 cases reviewed for digit transposition error, three such errors were detected (0.3 percent).

Figure 1 shows the age-sex distribution and chronicity of urticaria in the 79 patients. The majority of patients were female (76 percent). This proportion was statistically greater than the practice population sex ratio as determined by the difference-of-proportions test ($P < .05$). Where duration was specified, 52 of 74 patients had acute urticaria (70 percent) and 22 had chronic urticaria. There were 36 female patients with acute urticaria, 19 with chronic urticaria, and 5 for whom the duration was not specified. There were 16 male patients with acute urticaria and three with chronic urticaria. Urticaria patients in this practice were more likely to be in the 17- to 44-year age range.

In the 15 cases for which information on family history of atopy was recorded, 3 charts noted no family history of atopy, whereas 12 charts indicated a family history of atopy or urticaria or both. Two patients had a family history of urticaria.

There was no record of personal history of atopy in 47 charts. The other 32 patients included 21 with atopy and 11 without atopy. There were 29 charts in which both personal history of atopy and duration of urticaria were specified. Among 19 patients with atopy, 17 had acute urticaria and 2 had

*Specific calculations are available from the authors upon request.

Table 1. Chart Review Diagnosis of Urticaria in Relation to Chart Diagnosis and Code

Coded Diagnosis			Total Number of Charts Reviewed	Chart Review Diagnosis of Urticaria
Period	Code	Condition		
1975-1983	708	Urticaria	108	76*
1976-1979	708	Angioedema		*
Skin conditions considered likely to have been misdiagnosed or miscoded				
1981-1983	995.1	Angioedema	8	1
	695.1	Erythema multiforme	2	0
	698.4	Dermatitis factitia	0	0
	698.8	Other specified pruritic conditions	0	0
	698.9	Unspecified pruritic conditions	12	1
	693.0	Dermatitis due to substances taken internally	3	1
	692.4	Atopic dermatitis and related conditions due to other chemical products	0	0
A code number considered a likely candidate for miscoding due to digit transposition				
1981-1983	780	General symptoms	936	0
	Totals			79

*Four patients coded 708 urticaria/angioedema in the period 1976 to 1979 had chart review diagnoses of angioedema

chronic urticaria. Ten patients without atopy included 5 with acute urticaria and 5 with chronic urticaria. The relationship of personal history of atopy and acute urticaria was statistically significant ($P < .05$, Fisher's exact test).

In the majority of cases (54 percent) the physician felt it was not possible to make a causal association with a specific agent or condition. Associations were noted with infectious diseases in 13 percent, medications in 10 percent, other allergic causes in 8 percent, physical factors in 8 percent, and psychogenic factors in 13 percent. The total exceeded 100 percent because two or more causes were given in several cases. Associated infectious diseases included viral syndrome or upper respiratory infection (5 cases), streptococcal pharyngitis (1), otitis media (2), pneumonia (1), and urinary tract infection (1). Associated medications included zomepirac (3), ampicillin (1), penicillin (1), sulfonamide (1), trimethoprim and sulfamethoxa-

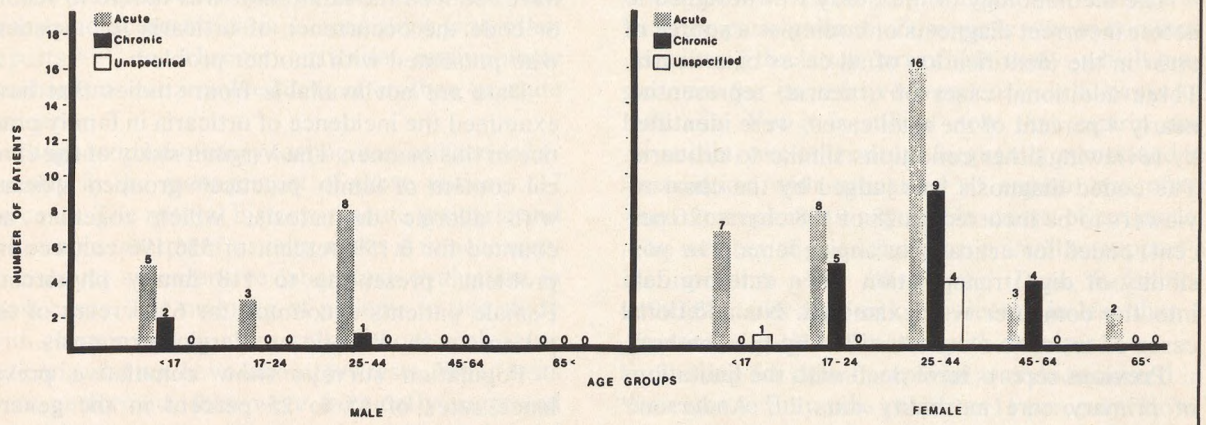

Figure 1. Age-sex distribution and duration of symptoms for 79 patients with urticaria

zole (1), and chlordiazepoxide (1). Associated physical factors included symptomatic dermographism (3).

Most patients were seen by a physician only once or twice for urticaria (87 percent), which is consistent with the preponderance of acute rather than chronic cases. The number of visits for patients with urticaria was 55 patients with 1 visit, 14 patients with 2 visits, 7 patients with 3 or 4 visits, 2 patients with 6 or 8 visits, and 1 patient with 10 visits (mean = 1.65).

Most patients (84 percent) had no diagnostic tests performed. Tests that were performed included throat culture (5 percent), complete blood count and sedimentation rate (4 percent), chest radiography, liver function tests, and urinalysis (2 percent each). Only 9 charts indicated that the patients had been tested for dermographism of which six patients had positive tests.

The management of most patients included antihistamines on a first or subsequent visit (89 percent). Diphenhydramine and hydroxyzine were most commonly prescribed, although sometimes cyproheptadine and other antihistamines were used. Other forms of treatment included systemic corticosteroids, adrenergic agents, and various topical medications. Of the 11 percent of patients not treated with antihistamines, almost all were treated with systemic corticosteroids.

Consultations with a specialist were obtained in 12 cases (15 percent). Eight patients saw a dermatologist, two an allergist, and one saw a dermatologist and an allergist. In one case the specialty of the consultant was not noted.

Discussion

The chart review study investigated the epidemiology, diagnosis, and management of urticaria in a family practice setting. Angioedema was not included in the study because of the difficulty in establishing diagnostic criteria for acute

angioedema not involving the upper airway or oropharynx. Data for the chart review were also examined to determine their reliability.

The methodology of this study was designed to detect incorrect diagnosis or coding as a source of error in the identification of all cases of urticaria. Three additional cases of urticaria, representing nearly 4 percent of the total cases, were identified by reviewing other conditions similar to urticaria. The coded diagnosis was judged by the chart reviewers to be incorrect in 28 of 108 charts (26 percent) coded for urticaria or angioedema. The possibility of digit transposition when entering data into the computer was examined. No additional cases of urticaria were identified by this method.

Previous reports have dealt with the limitations of primary care morbidity data.[11-13] Anderson[11] pointed out a number of potential problems in the recording of clinical data, diagnosis, coding, and study population demographic features. Intercoder variability was studied by Anderson and by Boyle and Schneeweiss.[13] The former cited coding accuracy ranging from 92 to 97 percent, whereas the latter reported coding accuracy of 70.4 percent (90.9 percent on "common problems" and 49.9 percent on "atypical problems").

The annual incidence of urticaria in this patient population was 0.27 percent. The correction factor method described by Cherkin et al[7] was used to determine the practice denominator. In this method the denominator is arrived at by multiplying the number of patients actually seen in a period of time by a correction factor. This factor is obtained by the use of practice demographic features and known relationships in the United States between these features and likelihood of visiting a physician. Potential problems in this calculation are discussed by Cherkin and colleagues. One source of error could be in the denominator calculation if the correction factors applied here (obtained from national data from the National Center for Health Statistics, as quoted by Cherkin et al) were inappropriate for this practice. This type of denominator calculation error might occur if demographic features not "corrected" for were different for this practice from the nation as a whole. A possible factor, for example, is that almost 30 percent of the practice population in this study was on public assistance. The numerator could be lower than it should be, ie, fewer cases of urticaria, if patients went directly to a dermatologist or other physician, rather than visiting the family physician. An additional factor that could have reduced the numerator was failure to record or code the occurrence of urticaria for a patient who presented with another problem.

Data are not available from studies that have examined the incidence of urticaria in family practice in this manner. The Virginia study of the clinical content of family practice[14] grouped urticaria with allergic dermatosis, which together accounted for 0.159 percent of 526,196 consecutive problems presenting to 118 family physicians. Female patients accounted for 61 percent of the patients with urticaria or allergic dermatosis.

Population surveys show cumulative prevalence rates of 15 to 25 percent in the general population.[3-5,15] A population survey in Sweden involving 36,475 persons showed that 0.11 percent of male patients and 0.14 percent of female patients had urticaria on physical examination[16]; thus, 44 percent of individuals with urticaria in that study were male. In the current study only 24 percent of patients were male, and urticaria patients were statistically more likely than the practice population to be female ($P < .05$). A possible source of error in this study is that male patients are less likely to consult a physician in general,[7] and possibly for urticaria specifically. A population survey, such as the Swedish study, is less likely to have this problem. In a dermatology practice in England, the peak incidence of urticaria occurred in the 18- to 40-year age group.[1]

In this study the ratio of acute to chronic urticaria was approximately two to one. At least two factors may have affected these numbers. Patients with acute urticaria may have been less likely to present to a physician than patients with chronic urticaria. However, patients with chronic urticaria may have been more likely than patients with acute urticaria to present directly to a dermatologist rather than to a family physician. No data are available from the literature for comparison. In a Mayo Clinic dermatology practice, 236 of 824 patients with urticaria had this problem for longer than 6 months.[2] Acute urticaria is most common in young patients of either sex, whereas chronic urticaria is more common in middle-aged women.[4] The results of this study were consistent with this observation. Patients with chronic urticaria were

even more likely to be female than were patients with acute urticaria, although the results did not achieve statistical significance.

The association noted in this study between atopy and acute urticaria is consistent with other reports.[1,4,5] In chronic urticaria immunologic mechanisms are involved less often than in acute urticaria.

Diagnostic laboratory testing was utilized infrequently in the management of these patients (17 percent). The natural history of acute urticaria and the simple treatment usually make it unnecessary to conduct an extensive laboratory evaluation in most cases. The majority of patients in this study with chronic urticaria, as well as those with acute urticaria, did not have laboratory tests. When tests were performed, they were frequently suggested by other symptoms. Tests are usually not helpful in the evaluation of chronic urticaria unless there are suggestive findings in the history and physical examination.[17] However, tests recommended in the evaluation of patients with urticaria (where the etiology was unclear from history and physical examination) have included complete blood count and erythrocyte sedimentation rate,[18] sinus roentgenograms,[17] throat cultures in children,[19] and an extensive set of tests in certain patients.[4] In this study one throat culture and one urine culture were positive. In both cases, history or physical examination suggested the need for these tests. One patient with chronic urticaria had extensive testing done and had a positive hepatitis B core antibody, the significance of which in relation to the urticaria was considered unclear.

The cause was unclear in 54 percent of cases of acute and chronic urticaria in this study. This percentage probably underestimated unknown etiology cases, as "possible" causes were grouped with more definite ones. It is often difficult to establish with certainty the cause of urticaria. For example, psychogenic factors may contribute to urticaria, but it is difficult in many cases to state with great assurance that psychogenic factors caused urticaria. It is a weakness of this type of chart review study that the degree of assurance of the physician in the etiologic association may be difficult for the chart reviewer to assess. In a dermatologic practice in England the cause of urticaria was reported as unknown in 79 percent of 554 patients, although this group included patients in whom aggravating factors such as psychological stress, aspirin, and infection were detected.[1]

Of further interest is the finding of etiologic association with dermographism and with zomepirac in three patients each. Zomepirac was in common use during the latter part of this study, which may account for its relative frequency as a cause of urticaria. Yet it is still of note that aspirin and penicillin, two other drugs frequently mentioned in association with urticaria,[4,5,18] appear less often than zomepirac as a possible cause of urticaria. The number of cases here is too small to support a definite link. The *Physicians' Desk Reference* (1983)[20] states that urticaria occurs in less than 1 percent of patients treated with zomepirac.

Testing for dermographism was documented in the chart in only nine patients (11 percent). However, six of the nine tests were positive. Dermographism is easily tested for and should be a part of the evaluation of urticaria by family physicians.[21] Three of the 79 patients in this study had symptomatic dermographism (3.8 percent), which is urticaria caused by physical pressure not ordinarily producing this condition in normal individuals. In a series of 554 dermatologic patients with urticaria, 8.5 percent had symptomatic dermographism.[1]

Antihistamines were most commonly prescribed for urticaria in this study (89 percent), consistent with the usual recommendations.[5,15,18] However, 20 percent of patients were treated with systemic corticosteroids, and some did not have a prior trial of antihistamines, which is usually recommended. Systemic corticosteroids seemed to be used by physicians in conjunction with antihistamines in chronic refractory cases or when the signs and symptoms were more severe or a hypersensitivity reaction to a medication appeared to be the cause. A small number of faculty physicians prescribed corticosteroids instead of antihistamines in acute urticaria of unknown etiology. A potential error in this study is inaccuracy in the recording in the chart of drugs prescribed by the physician.[22]

Consultation with a specialist occurred in only 15 percent of patients in this study. Most referred patients had chronic urticaria. Reasons for referral included need for hypersensitivity testing, patient preference, and confirmation of diagnosis. It is likely that a number of patients with urticaria did not consult a physician. These observations sug-

gest that studies of urticaria patients in dermatologic practice are unrepresentative of urticaria as it presents to the primary care physician. Confirmation of this issue requires further study.

This study will help family physicians understand the epidemiology, natural history, and management of patients with urticaria in primary care. Close scrutiny should be directed toward primary care morbidity data to improve its reliability. Clinical epidemiologic studies in primary care should incorporate methods for detecting diagnostic or coding error.

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