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Emergency Department Utilization in Patients With Chronic Spontaneous Urticaria Followed at a Tertiary Referral Center: A Retrospective Cross-Sectional Study

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ABSTRACT

Background: Chronic spontaneous urticaria (CSU) frequently prompts emergency department (ED) visits, but few studies have characterized this utilization in a defined dermatology cohort under contemporary anti-IgE therapy.

Objective: To quantify ED utilization, identify factors associated with prior ED visits, and describe the pattern of ED-initiated dermatology consultation in adult CSU patients at a tertiary referral center.

Methods: Retrospective cross-sectional analysis of 195 adult patients with physician-diagnosed CSU at a single tertiary dermatology clinic between June 1, 2025, and December 31, 2025. Three operational ED utilization rates were estimated. Patients with at least one prior ED visit were compared with patients without, and a multivariable logistic regression model was constructed.

Results: Median age was 43 years (Q1–Q3: 36–51); 66.2% were female; angioedema was reported in 24.1% and omalizumab prescribed in 97.9%. The ED served as the initial point of contact in 5.1% (95% confidence interval [CI]: 2.8%–9.2%); 45.1% (95% CI: 38.3%–52.1%) had any prior ED visit and 26.2% (95% CI: 20.5%–32.7%) had recurrent visits. Among ED users, antihistamines were administered in 93.2% and systemic corticosteroids in 59.1%, while ED-initiated dermatology consultation was documented in only 8.0% (95% CI: 3.9%–15.5%). In multivariable analysis, concomitant angioedema was independently associated with prior ED utilization (adjusted OR: 3.99, 95% CI: 1.93–8.69, $p < 0.001$); identifiable trigger was inversely associated (adjusted OR: 0.36, 95% CI: 0.14–0.88, $p = 0.025$).

Conclusions: Even though omalizumab had been prescribed in 97.9% of the patients, almost half had attended the ED and consultation occurred in fewer than one in ten ED users. Concomitant angioedema independently predicts ED utilization, and ED encounters represent a missed integration point in CSU longitudinal care.

1 | Introduction

Chronic spontaneous urticaria (CSU) is defined by the recurrence of itchy wheals, angioedema, or both for more than six weeks without an identifiable external trigger. The 2022 international EAACI/GA^{2}LEN/EuroGuiDerm/APAAACI guideline classifies CSU as a chronic inflammatory disorder driven by mast cell activation and recommends a stepwise approach beginning with second-generation H1-antihistamines,

followed by updosing and the addition of omalizumab in refractory disease [1]. Estimated 12-month prevalence in adult populations ranges from 0.5% to 1%, with a strong female predominance and a typical age of onset between the third and fifth decades [2].

Beyond its dermatological manifestations, CSU exerts a substantial burden on quality of life, work productivity, and emotional well-being, with high rates of ambulatory and emergency healthcare contact reported in real-world cohorts [2, 3].

Despite this evidence on aggregate burden, comparatively little has been published on how patients with CSU interact specifically with emergency services. Most ED-focused urticaria studies have addressed acute or pediatric urticaria episodes [4, 5] or have approached new-onset urticaria and angioedema from the perspective of frontline clinicians [6]. How often patients already enrolled in chronic outpatient dermatology care attend the ED for urticaria-related symptoms, and whether these encounters trigger appropriate handover to dermatology, remain insufficiently characterized in the contemporary anti-IgE era. Addressing this gap is clinically important: ED visits represent costly, fragmented care episodes that may indicate inadequate disease control or unmet needs in chronic management [7].

We conducted a single-center retrospective study of adult CSU patients followed at a tertiary dermatology referral clinic in Istanbul, Türkiye. Our objectives were as follows: (i) to estimate the proportion of patients with any prior emergency department visit related to urticaria and the proportion with recurrent ED utilization; (ii) to identify demographic and clinical factors—including angioedema, identifiable triggers, and treatment exposure—independently associated with ED utilization; and (iii) to describe the rate of emergency-physician-initiated dermatology consultation among CSU patients attending the ED, which to our knowledge has not been previously quantified.

2 | Methods

2.1 | Study Design and Setting

This was a retrospective, cross-sectional, single-center study conducted at a tertiary dermatology referral clinic in Istanbul, Türkiye. Routine clinical data were extracted from hospital records covering encounters between June 1, 2025, and December 31, 2025.

2.2 | Participants

Eligible participants were adults (≥ 18 years) with a clinically confirmed diagnosis of CSU, defined per the international guideline as recurrent wheals, angioedema, or both for more than six weeks in the absence of a definite physical trigger [1]. All included patients had at least one outpatient dermatology encounter within the study window, and complete information on the route of presentation (outpatient clinic vs. ED) was required. Patients with acute urticaria (< 6 weeks of symptoms), bradykinin-mediated angioedema (including hereditary or acquired C1-inhibitor deficiency), pregnancy, lactation, age below 18 years, or insufficient documentation were excluded. Of 215 records initially retrieved, 15 incomplete entries and 5 duplicate registrations of the same patient were excluded, yielding a final analytical sample of 195 unique patients.

2.3 | Variables and Definitions

Demographic data included age and sex. Disease-related variables comprised the presence of angioedema, identifiable triggers (infection, stress, drugs, malignancy, and menstruation), and dermatology treatment exposure. Standard-dose H1-antihistamine was defined as licensed once-daily second-generation H1-antihistamine monotherapy (1×1); updosed H1-antihistamine was defined as any regimen exceeding the standard once-daily dose, in line with the guideline-recommended stepwise escalation [1]. Other dermatology treatments recorded were cyclosporine, systemic corticosteroids, omalizumab, and methotrexate. ED-related variables comprised whether the index encounter originated from the ED, the cumulative number of urticaria-related ED visits, the reason for ED presentation (urticaria, angioedema, or both), the number of dermatology consultations requested by emergency physicians, and the medications administered in the ED (antihistamines, systemic corticosteroids, and adrenaline).

Three operational definitions of ED utilization were prespecified: (i) ED as the initial point of contact, defined as a documented ED visit immediately preceding the index outpatient encounter; (ii) any prior ED visit, defined as one or more documented urticaria-related ED encounters at any point; and (iii) recurrent ED visits, defined as two or more documented urticaria-related ED encounters. The presence of any prior ED visit was prespecified as the primary outcome for between-group comparisons because of its statistical stability and its correspondence to the clinical question of lifetime emergency-care exposure.

2.4 | Statistical Analysis

Continuous variables were tested for normality with the Shapiro–Wilk test and reported as median (Q1–Q3); categorical variables as counts and percentages. Wilson score 95% confidence intervals (CIs) were calculated for proportions. Two-group comparisons used the Mann–Whitney U test, Pearson's chi-square, or Fisher's exact test as appropriate. Spearman's rank correlation assessed the association between ED visit and consultation counts. A multivariable logistic regression model with prior ED utilization as the dependent variable included all variables with univariate $p < 0.10$. Because systemic corticosteroid exposure exhibited quasicomplete separation in this model, the multivariable regression was re-estimated using Firth's penalized-likelihood logistic regression, with 95% CIs and p values derived from the penalized profile likelihood. Because the final model was estimated by penalized likelihood, for which the null distribution of the Hosmer–Lemeshow statistic is not established, this goodness-of-fit test was not applicable and is, therefore, not reported. Two-sided $p < 0.05$ was considered significant. Descriptive and bivariate analyses were performed using SPSS 22.0; the Firth penalized-likelihood model was implemented in Python (Version 3.12).

2.5 | Ethics

The study was approved by the Health Sciences Research Ethics Committee of Istanbul Kent University (approval number: E-10420511-051-53700) and conducted in accordance with the Declaration of Helsinki. Because of the retrospective design and use of deidentified institutional records, individual informed consent was waived by the ethics committee.

TABLE 1 | Demographic and clinical characteristics of the study cohort ($n = 195$).

Variable	Value
Age, years: median (Q1–Q3)	43 (36–51)
Age, years: mean ± SD	44.7 ± 13.0
Female sex, *n* (%)	129 (66.2%)
Female-to-male ratio	1.95:1
Angioedema, *n* (%)	47 (24.1%)
Identifiable trigger, *n* (%)	29 (14.9%)
Omalizumab, *n* (%)	191 (97.9%)
Updosed H1-antihistamine, *n* (%)	108 (55.4%)
Standard-dose H1-antihistamine, *n* (%)	101 (51.8%)
Systemic corticosteroid, *n* (%)	10 (5.1%)
Cyclosporine, *n* (%)	2 (1.0%)
Methotrexate, *n* (%)	2 (1.0%)

Note: Q1–Q3: first to third quartile.
Abbreviation: SD, standard deviation.

3 | Results

3.1 | Cohort Characteristics

The 195 included patients had a median age of 43 years (Q1–Q3: 36–51; range 22–80). Women predominated (129 of 195, 66.2%), with a female-to-male ratio of 1.95:1. Angioedema was reported in 47 patients (24.1%; 95% CI: 18.6%–30.6%), and an identifiable trigger was documented in 29 patients (14.9%); the most common trigger types were stress (15 patients), drugs (8 patients), and infection (4 patients). Reflecting the tertiary referral nature of the clinic, omalizumab had been prescribed in 191 patients (97.9%); other systemic dermatology treatments included updosed H1-antihistamines (108 patients, 55.4%), standard-dose H1-antihistamines (101 patients, 51.8%), systemic corticosteroids (10 patients, 5.1%), cyclosporine (2 patients), and methotrexate (2 patients) (Table 1).

3.2 | Emergency Department Utilization

Three operational definitions of ED utilization yielded distinct estimates (Table 2). Ten of 195 patients (5.1%; 95% CI: 2.8%–9.2%) had been first referred to the dermatology service via the ED. Eighty-eight patients (45.1%; 95% CI: 38.3%–52.1%) had at least one prior urticaria-related ED visit, and 51 patients (26.2%; 95% CI: 20.5%–32.7%) had recurrent visits. Among the 88 patients with any prior ED visit, the median number of visits was 2 (Q1–Q3: 1–3) with a range of 1–15.

The reason for ED presentation was documented for all 88 patients with any prior ED visit: urticaria alone in 66 (75.0%), angioedema alone in 5 (5.7%), and both wheals and angioedema in 17 (19.3%); an angioedema-related component was, therefore, present in 22 of 88 presentations (25.0%).

3.3 | Treatments Delivered in the Emergency Department

Among the 88 patients with any prior ED visit, antihistamines were administered in 82 patients (93.2%), systemic corticosteroids in 52 patients (59.1%), and adrenaline in 3 patients (3.4%). In all three, adrenaline was administered for symptoms suggestive of anaphylaxis, and two of the three had concomitant angioedema. Dermatology consultation was requested by emergency physicians in only 7 of 88 patients (8.0%; 95% CI: 3.9%–15.5%), corresponding to 7 of 195 (3.6%) across the entire cohort. The number of consultations per patient correlated weakly and nonsignificantly with the number of ED visits (Spearman $\rho = 0.18$, $p = 0.093$).

3.4 | Factors Associated With Prior ED Utilization

Patients with at least one prior ED visit ($n = 88$) were compared with those with no prior ED visit ($n = 107$) (Table 3). Age (Mann–Whitney U test, $p = 0.731$) and sex (chi-square, $p = 0.318$) did not differ between groups. Concomitant angioedema was strongly associated with prior ED utilization: 38.6% in ED users versus 12.1% in nonusers ($p < 0.001$), yielding an unadjusted odds ratio of 4.55 (95% CI: 2.21–9.37). Use of systemic corticosteroids as part of dermatology-clinic management—distinct from acute ED administration—was also more frequent among ED users than nonusers (10.2% vs. 0.9%; Fisher's exact $p = 0.006$). However, because only 10 patients had received systemic corticosteroids (including only one patient in the non-ED group), this variable was recognized as sparse and was subsequently modeled using Firth's penalized-likelihood logistic regression to minimize small-sample bias. The presence of an identifiable trigger and use of updosed antihistamines showed borderline associations ($p = 0.098$ and $p = 0.070$, respectively).

3.5 | Multivariable Logistic Regression

Variables with univariate $p < 0.10$ were entered into a multivariable logistic regression model (Table 4). Because systemic corticosteroid exposure exhibited quasicomplete separation (only one patient without a prior ED visit had been exposed), the model was estimated using Firth's penalized-likelihood logistic regression, with 95% CIs and p values derived from the penalized profile likelihood. After adjustment, angioedema remained independently associated with prior ED utilization (adjusted OR: 3.99, 95% CI: 1.93–8.69, $p < 0.001$), while the presence of an identifiable trigger emerged as an independent inverse predictor (adjusted OR: 0.36, 95% CI: 0.14–0.88, $p = 0.025$). Updosed antihistamine use was not significant after adjustment (adjusted OR: 1.46, 95% CI: 0.79–2.71). Although systemic corticosteroid use remained statistically significant after penalization (adjusted OR: 5.29, 95% CI: 1.01–55.00, $p = 0.049$), the estimate remained imprecise because of the limited number of exposed patients. Therefore, this finding should be interpreted cautiously and regarded as exploratory rather than confirmatory.

Among the 88 patients with at least one prior ED visit, those with concomitant angioedema ($n = 34$) were compared with those presenting with wheals alone ($n = 54$) (Table 5). There were no significant differences between the two groups regarding age (median 46.5 vs. 42.5 years, $p = 0.408$), female sex (70.6% vs. 70.4%, $p = 1.000$), the presence of an identifiable trigger (14.7% vs. 7.4%, $p = 0.299$), or use of updosed H1-antihistamines (64.7% vs. 61.1%, $p = 0.823$). Patients with angioedema were more likely to receive systemic corticosteroids as part of outpatient dermatology management than those without angioedema (20.6% vs.

TABLE 2 | Emergency department (ED) utilization rates under three operational definitions ($n = 195$).

Definition	*n*/*N*	Proportion (%)	95% CI (Wilson)
ED as the initial point of contact with the dermatology service	10/195	5.1	2.8%–9.2%
At least one prior ED visit (primary outcome)	88/195	45.1	38.3%–52.1%
Recurrent ED visits (≥ 2)	51/195	26.2	20.5%–32.7%

TABLE 3 | Comparison of patients with and without prior emergency department (ED) visits.

Variable	Any prior ED visit ($n = 88$)	No prior ED visit ($n = 107$)	Test	*p*
Age, median (Q1–Q3)	43.5 (35.8–50.3)	43 (38–51)	Mann–Whitney U	0.731
Female sex, *n* (%)	62 (70.5%)	67 (62.6%)	χ^2	0.318
Angioedema, *n* (%)	34 (38.6%)	13 (12.1%)	χ^2	< 0.001
Unadjusted OR (95% CI)	4.55 (2.21–9.37)			
Identifiable trigger, *n* (%)	9 (10.2%)	20 (18.7%)	χ^2	0.147
Standard-dose H1-antihistamine, *n* (%)	47 (53.4%)	54 (50.5%)	χ^2	0.791
Updosed H1-antihistamine, *n* (%)	55 (62.5%)	53 (49.5%)	χ^2	0.095
Systemic corticosteroid, *n* (%)	9 (10.2%)	1 (0.9%)	Fisher exact	0.006

Note: Cyclosporine ($n = 2$), omalizumab ($n = 191$; insufficient variance), and methotrexate ($n = 2$) were not entered into comparative analyses.
Abbreviation: OR, odds ratio.

TABLE 4 | Multivariable logistic regression for prior ED utilization (firth penalized-likelihood model).

Variable	β	SE	Adjusted OR	95% CI/*p*
Angioedema (yes vs. no)	1.385	0.386	3.99	1.93–8.69/$p < 0.001$
Identifiable trigger (yes vs. no)	−1.010	0.477	0.36	0.14–0.88/$p = 0.025$
Updosed antihistamine (yes vs. no)	0.379	0.316	1.46	0.79–2.71/$p = 0.226$
Systemic corticosteroid (yes vs. no)*	1.666	1.007	5.29	1.01–55.00/$p = 0.049$

Note: β: regression coefficient; intercept omitted for clarity. Estimates are from Firth's penalized-likelihood logistic regression; 95% confidence intervals and *p* values are based on the penalized profile likelihood.
Abbreviations: OR, odds ratio; SE, standard error.
*Systemic corticosteroid exposure was sparse (10 exposed patients, including only one patient in the non-ED group); therefore, Firth's penalized-likelihood logistic regression was used to reduce small-sample bias associated with quasicomplete separation.

TABLE 5 | Comparison of patients with prior ED visits according to the presence of angioedema ($n = 88$).

	Angioedema ($n = 34$)	No angioedema ($n = 54$)	*p* value
Age, median (years)	46.5	42.5	0.408
Female sex, *n* (%)	24 (70.6%)	38 (70.4%)	1.000
Identifiable trigger, *n* (%)	5 (14.7%)	4 (7.4%)	0.299
Updosed H1-antihistamine, *n* (%)	22 (64.7%)	33 (61.1%)	0.823
Systemic corticosteroid*, *n* (%)	7 (20.6%)	2 (3.7%)	0.025
ED visits, Median	2	1.5	0.104

*Dermatology outpatient treatment, not acute ED treatment.

3.7%, $p = 0.025$). The median number of ED visits did not differ significantly between patients with and without angioedema (2 vs. 1.5 visits, $p = 0.104$) (Table 5).

4 | Discussion

In this single-center retrospective cohort of 195 adult patients with CSU followed at a tertiary referral dermatology clinic, three findings stand out. First, the lifetime burden of ED utilization remained substantial—45.1% had attended the ED at least once for urticaria-related complaints, and 26.2% had done so on two or more occasions—even though omalizumab had been prescribed in 97.9% of the patients. Second, concomitant angioedema independently increased the likelihood of prior ED visits approximately fourfold. Third, dermatology consultation was requested in only 8% of the CSU patients attending the ED, suggesting a missed opportunity to integrate acute encounters into longitudinal disease management.

To further clarify whether this association reflected acute angioedema episodes themselves or a more severe CSU phenotype, we examined the characteristics of ED users according to the presence of angioedema. Although angioedema remained independently associated with prior ED utilization in the multivariable analysis, only one-quarter of ED presentations actually involved angioedema, whereas three-quarters were attributable to wheals alone. Furthermore, among patients with prior ED utilization, those with and without angioedema had comparable demographic characteristics, identifiable triggers, use of updosed antihistamines, and the number of ED visits. The only significant difference was a higher frequency of systemic corticosteroid use among patients with angioedema, which may reflect greater treatment requirements in this subgroup. Taken together, these findings suggest that angioedema is unlikely to be the direct reason for most ED presentations and may instead identify patients with a more burdensome clinical phenotype associated with increased healthcare utilization. Nevertheless, because validated measures of disease activity were not available, this interpretation should be considered hypothesis-generating and warrants confirmation in prospective studies.

The proportion of patients with at least one prior ED visit (45.1%) in our cohort is not directly comparable to the 60.2% 6-month ED visit rate reported by Soong and colleagues in the United States NHWS sample [2]: the Soong figure is restricted to self-reported ED visits in the preceding 6 months, whereas our denominator captures documented urticaria-related ED encounters at any point prior to the index outpatient visit (lifetime exposure within a single institution's information system). The two metrics therefore measure different time windows and ascertainment modes and cannot be ranked against each other. The recurrent visit rate of 26.2% in our cohort is, however, consistent with the high rate of repeated acute care contacts described in the U.S. real-world refractory CSU population [3], where prolonged delays in specialist care were identified as a contributor to urgent care use. Taken together, these data indicate that ED utilization is a structural feature of the CSU patient journey rather than an artifact of any specific health system.

The robust association between angioedema and ED utilization, with an adjusted odds ratio of approximately four, is in line with pediatric ED data in which angioedema was independently associated with progression from acute to chronic urticaria (OR: 2.7, $p = 0.007$) [4]. Direct evidence that angioedema predicts subsequent ED utilization in adult CSU is limited; mechanistically, angioedema episodes are more likely than wheals alone to provoke fear of airway compromise and to prompt acute presentation. From a clinical-pathway perspective, this finding argues for proactive counseling, written action plans, and early biologic escalation in CSU patients with angioedema, irrespective of disease activity scores. Khaliliya and colleagues reported, in CSU patients older than 65 years, that specialist intervention was associated with a large reduction in ED visits [7]; whether comparable reductions are achievable in adults of working age warrants prospective study.

The inverse association between an identifiable trigger and ED utilization (adjusted OR: 0.36) was unexpected. Several explanations are plausible: patients in whom a trigger is recognized may engage in successful avoidance behaviors; identification of a trigger may reflect more attentive longitudinal care and patient education; or identifiable triggers may correlate with milder, more episodic phenotypes. However, this finding was based on relatively small numbers and should, therefore, be interpreted cautiously. The 2022 international guideline emphasizes that confirmed triggers in true CSU are uncommon and that exhaustive workup is not recommended [1]. Accordingly, our results should not be interpreted as evidence of a causal protective effect of trigger identification but rather as an observation that warrants confirmation in larger prospective studies.

The most striking finding of our analysis is the very low rate of dermatology consultation initiated from the ED—only 7 of 88 ED users (8.0%). To our knowledge, this is the lowest rate quantified to date in adult CSU. Macy noted that new-onset urticaria and angioedema are commonly mistaken for IgE-mediated allergic reactions and frequently treated with systemic corticosteroids that confer no benefit and potential harm [6]; in our cohort, 59.1% of ED users received systemic corticosteroids, supporting the hypothesis that ED management of CSU exacerbations remains misaligned with current evidence. Recent meta-analytic data indicate that the magnitude of benefit from add-on systemic corticosteroids in acute urticaria or chronic urticaria flares depends on baseline antihistamine responsiveness: in patients with low or moderate probability of responding to antihistamines alone, corticosteroids produced an absolute improvement of approximately 14%–15% (NNT 7; moderate certainty), whereas in patients with a high probability of antihistamine response the absolute difference was only about 2% (NNT 45). Corticosteroids also likely increase adverse events (OR: 2.76, 95% CI: 1.00–7.62; NNH 9) [8]. When viewed together with the low consultation rate, these findings suggest a need for structured ED–dermatology referral protocols, embedded order sets, and brief educational interventions targeting frontline emergency physicians.

Omalizumab exposure of 97.9% reflects the tertiary, biologic-eligible nature of the cohort and precluded its use as an analytic variable. A recent network meta-analysis identified standard-dose omalizumab (300 mg every 4 weeks) as among the most effective biologic options for antihistamine-refractory chronic urticaria, with comparable effectiveness reported for remibrutinib [9], and biosimilar evidence supports the therapeutic equivalence of CT-P39 with reference omalizumab in CSU [10]. Our data nonetheless show that even high omalizumab penetration does not eliminate ED-level burden, underscoring residual unmet need.

5 | Strengths and Limitations

Strengths include a well-characterized single-institution cohort, a prespecified statistical plan, transparent reporting of three distinct ED utilization definitions, and a multivariable model adjusting for clinically relevant covariates. Several limitations should temper interpretation. First, the retrospective design captures only ED visits documented in the institutional information system; visits to other facilities are not recorded and the true burden may be underestimated. Second, the very high proportion of patients receiving omalizumab (97.9%) reflects tertiary-center selection, limits generalizability to community settings, and prevented an internal comparison by biologic status. Third, the cohort consisted exclusively of adults; pediatric and

elderly populations have distinct risk profiles [4, 7]. Fourth, validated patient-reported outcome measures (UAS7, UCT, and DLQI) were not consistently recorded. Finally, the small absolute number of consultations ($n = 7$) limits inferential analysis and motivates prospective study. Furthermore, because of the cross-sectional design, the temporal relationship between omalizumab initiation and ED visits could not be determined; some ED encounters may have occurred before or during the early phase of omalizumab therapy rather than representing breakthrough utilization on established treatment, which limits causal interpretation of the ED burden observed despite high omalizumab exposure.

6 | Conclusion

Within a tertiary CSU cohort with very high omalizumab uptake, almost half of the patients had attended the emergency department for urticaria-related symptoms and recurrent ED utilization was common. Concomitant angioedema independently increased the odds of ED utilization approximately fourfold, identifying a high-risk phenotype that warrants prioritized longitudinal care. Strikingly, dermatology consultation was requested in fewer than one in ten ED encounters, indicating a structural disconnection between acute and chronic care pathways. Embedding clear ED-to-dermatology referral protocols and disease-specific decision support may reduce avoidable healthcare contacts and improve the continuity of care for patients with CSU.

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Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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