On-treatment clinical remission of severe asthma with real-world longer-term biologic use

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Background: There are limited real-world data describing the proportion of patients with severe asthma (SA) who achieve on-treatment clinical remission with long-term biologic treatment.

Objective: Our aim was to examine the proportion and characteristics of adults with SA who achieved clinical remission with biologic therapy.

Methods: CHRONICLE is an observational study of US subspecialist–treated adults with SA. Sites reported exacerbations and biologic use from 12 months before enrollment forward. Monthly Asthma Control Test scores and 6-monthly specialist assessments of asthma control were collected. Patients who enrolled from February 2018 to February 2023, began taking a biologic during the study observation period, and continued use of that biologic for at least 12 months were evaluated. Incident on-treatment clinical remission was defined in a 12-month interval as the absence of exacerbations and systemic corticosteroid use, a 50% or greater improvement in Asthma Control Test scores of least 20 points in the latest 6 months, and specialist report of asthma control.

Results: Among the evaluable patients (n = 611), the median duration of biologic use was 39.6 months. In at least one 12-month interval during the study, 79.9% of patients had no exacerbations or systemic corticosteroid use and 46.0% met the definition of clinical remission at any point. The point prevalence of clinical remission increased from 22.3% at 12 to 13 months of biologic use to 34.3% at 47 to 48 months of biologic use.

Conclusions: In a real-world cohort of patients with SA with longer-term biologic treatment, almost one-half achieved on-treatment clinical remission. With at least 1 year of biologic therapy, clinical remission is a feasible treatment goal in SA. (J Allergy Clin Immunol Global 2025;4:100365.)

Key words: *Severe asthma, biologic, clinical remission*

Severe asthma (SA) affects an estimated 3% to 10% of all individuals with asthma.[1,2] SA is defined by the European Respiratory Society (ERS)/American Thoracic Society (ATS) guidelines as asthma that either requires treatment with high-dosage inhaled corticosteroids (ICSs) plus a second controller (and/or systemic corticosteroids [SCSs]) to prevent it from becoming uncontrolled or remains uncontrolled despite this therapy.[2] Studies have shown that the disease of approximately 35% to 55% of treated patients with SA remains uncontrolled.[3,4] This unmet clinical need led to the development of targeted biologic (ie, mAb) therapies for the treatment of SA, 6 of which have been approved in the past 2 decades.[5-10]

Given the demonstrated clinical value of biologics for SA, there is interest in targeting on-treatment clinical remission as a treatment goal.[11,12] On-treatment clinical remission has been defined as a therapeutic target in other inflammatory diseases, such as rheumatoid arthritis (RA), ulcerative colitis, and SLE.[13-15] In 2020, an expert consensus proposed an initial framework for remission in asthma: at least 12 months with sustained absence of significant symptoms based on a validated instrument, optimization and stabilization of lung function, patient and provider agreement regarding remission, and no use of SCSs for exacerbation treatment or maintenance therapy.[12]

To further refine the definition of clinical remission in SA, the framework called for assessment of improvements by testing and revision based on prospective and retrospective analyses of clinical outcomes. The real-world data describing clinical remission with biologic treatment among patients with SA are limited. Thus, the objective of this analysis was to evaluate the proportion of patients who achieve incident clinical remission with at least 12 months of biologic therapy among a large cohort of subspecialist-treated adults with SA in the United States. This study further examined the characteristics of patients with SA achieving versus not achieving clinical remission.

METHODS

Study design

The study evaluated patients enrolled in the CHRONICLE study.[16] CHRONICLE (ClinicalTrials.gov identifier NCT0337 3045) is an ongoing noninterventional study of US adults with SA who were treated by allergists/immunologists or pulmonologists at 137 geographically diverse participating sites. Eligible patients must have subspecialist-diagnosed SA, as

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Data availability: CHRONICLE is an ongoing study; therefore, individual deidentified participant data cannot be shared until the study concludes. The full study protocol is available on request submitted to the corresponding author. Individuals who were or were not involved in the study may submit publication proposals to the study's publication steering committee by contacting the corresponding author.

Received for publication February 6, 2024; revised June 28, 2024; accepted for publication October 7, 2024.

Available online October 30, 2024.

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2772-8293

https://doi.org/10.1016/j.jacig.2024.100365

Abbreviations used
AAAAI: American Academy of Allergy, Asthma & Immunology
ACAAI: American College of Allergy, Asthma & Immunology
ACT: Asthma Control Test
ATS: American Thoracic Society
BEC: Blood eosinophil count
ERS: European Respiratory Society
FENO: Fractional exhaled nitric oxide
ICS: Inhaled corticosteroid
RA: Rheumatoid arthritis
SA: Severe asthma
SCS: Systemic corticosteroid

defined by ERS/ATS guidelines, for at least 12 months before enrollment. Furthermore, eligible patients must either be treated with biologic therapy or maintenance SCSs or have persistently uncontrolled asthma despite treatment with high-dosage ICSs and additional controllers.[16] The study had no influence on biologic use, which is determined by approved indications, clinical judgment, and US health care insurance reimbursement criteria.[5-10] Prior CHRONICLE study analyses have demonstrated that patient characteristics across individual biologics are generally similar but do vary in a manner that is consistent with different US Food and Drug Administration indications and dates of approval.[3]

Sites report asthma exacerbations and asthma medications (with start dates) for the 12 months before enrollment and every 6 months after enrollment. Pulmonary function test results are collected as performed in routine clinical practice for the latest examination before enrollment as well as for subsequent evaluations during study follow-up. In addition, patients are asked to complete the Asthma Control Test (ACT) monthly as well as the Work Productivity and Activity Impairment–Asthma questionnaire every 3 months.[17,18] Subspecialists' assessments of their patients' asthma condition as either controlled or uncontrolled are collected every 6 months.[16]

Analysis

The proportion of patients achieving clinical remission subsequent to treatment with a biologic (benralizumab, dupilumab, mepolizumab, omalizumab, reslizumab, or tezepelumab) was evaluated among patients enrolled between February 2018 and February 2023 who initiated biologic treatment within 12 months before enrollment or later. The included patients were required to have received biologics continuously for 12 months or longer and have evaluable data for all remission criteria. Patients who switched between biologics were included if there was no treatment gap between use of the 2 biologics.

The definition of remission was based on that of the published Delphi framework but was adapted to align with CHRONICLE data collection (Table I). The Delphi panel criteria defined on-treatment clinical remission as meeting all 4 of the following criteria for at least 12 months: absence of significant symptoms, optimized and stabilized lung function, patient and provider agreement on clinical remission, and no use of an SCS for exacerbations or long-term disease control.[12] In the current analysis, among patients receiving biologics, clinical remission was defined within a period of 12 consecutive months as the absence of exacerbations and SCS use, at least 50% of ACT scores of 20 or more points in the latest 6 months, and subspecialist report of asthma control in the latest 6 months. These remission criteria were evaluated in each patient in rolling 12-month intervals before each monthly ACT assessment to determine whether and when the patient first achieved remission during the study observation period. Because CHRONICLE participants are asked to complete the ACT every month (much more frequently than would occur in clinical practice), a threshold of at least 50% of ACT scores of 20 or more points in the latest 6 months was considered the best measure of "absence of significant symptoms based on a validated instrument"; use of all ACT scores was considered problematic given the limitations inherent in evaluating multiple assessments in a short time interval. To evaluate an alternative approach that might better approximate clinical practice, a sensitivity analysis requiring the most recent ACT score to be 20 points or higher was conducted. Although lung function results are collected in CHRONICLE and 91% of enrolled patients had results reported at some point during the study, an assessment of "optimized and stabilized lung function" was not included in the analysis definition of remission owing to limited results before biologic initiations, infrequently reported repeat measurements of lung function testing, and the resulting inability to assess changes in lung function following biologic initiation and over time. Specialists reported their patients' asthma condition as either controlled or uncontrolled. Patient and provider agreement regarding remission was approximated by requiring both a specialist report of control and a patient report of asthma control via the ACT simultaneously.

To better understand patient characteristics associated with achievement of on-treatment clinical remission, patient demographics and clinical characteristics were compared by remission status. Clinical characteristics included biologic use, blood eosinophil count (BEC), IgE level, fractional exhaled nitric oxide (FENO) level, and comorbidities. Means were compared by using *t* test results, and categoric variables were compared with chi-square test results, with significance set at P less than .05.

Remission with respect to time was measured as cumulative incidence (ie, the proportion of patients who achieved remission at any time during the study period) and point prevalence (ie, the proportion who were in remission at monthly intervals during the study period). Time to the first remission was analyzed by using the Kaplan-Meier method for patients who achieved remission after 12 months of biologic use and was calculated as the time from the first biologic use to the first time (based on relevant ACT collection date) that the patient achieved remission criteria. For patients who did not achieve any remission, the censoring date was the last ACT evaluation.

After our initial analysis, an alternative definition of on-treatment asthma remission was endorsed by the American College of Allergy, Asthma and Immunology (ACAAI), American Academy of Allergy, Asthma & Immunology (AAAAI), ATS, and the European Forum for Research and Education in Allergy and Airway Diseases.[19] The new criteria include additional components with the goal of establishing "a higher standard than simply great asthma control": no work or school absenteeism over a 12-month period, no use of high-dosage ICS treatment, and reliever inhaler therapy use no more than once per month over a 12-month period.[19] We included an evaluation based on these criteria as a supplementary analysis. For this analysis, in addition to the methods outlined earlier,

TABLE I. Analysis criteria for on-treatment remission

Delphi panel criteria[12]	Adapted criteria using available CHRONICLE data
For ≥12 mo	For ≥12 mo
No use of SCS for exacerbations or long-term disease control	Absence of exacerbations and SCS use in the 12-mo interval
Absence of significant asthma symptoms based on a validated instrument	≥50% of ACT scores ≥20 (alternative criterion: latest ACT score ≥20)
Optimization and stabilization of lung function	No assessment of lung function owing to data limitations
Patient and HCP agreement on disease remission	Specialist-reported asthma control in the latest 6 months in conjunction with patient-reported control by ACT score

HCP, Health care professional.

responses from the Work Productivity and Activity Impairment–Asthma questionnaire were used to capture work or school absenteeism. Additionally, patient use of a reliever inhaler was collected from the ACT question: "During the past 4 weeks, how often have you used your rescue inhaler or nebulizer medication?", with responses of "Not at all" or "Once a week or less" counted as indicative of low reliever inhaler use (note that these do not exactly match the ACAAI/AAAAI/ATS criterion of no more than once per month).

RESULTS

Patient characteristics

There were 611 evaluable patients with biologic use for at least 12 months and complete data (Table II). At enrollment, the biologics received by these patients were omalizumab (28.2%), benralizumab (25.7%), mepolizumab (18.7%), dupilumab (12.4%), and reslizumab (2.6%). No patients included in this analysis received tezepelumab. The median per-patient duration of biologic use (summed across biologics if more than 1 biologic was used) was 39.6 months. Approximately half of the evaluable patients lived in suburban areas (44.4%), had commercial insurance (62.7%), and were employed (53.0%) (Table II).

Remission outcome

In the rolling 12-month intervals, 79.9% of patients (n = 488) had no SCS use for exacerbation or maintenance therapy. Among this population, 330 (54.0% of all patients) also had at least 50% of their monthly ACT scores be 20 points or more in the latest 6 months, and 281 (46.0% of all patients) also had specialist report indicating asthma control (Fig 1). Using the alternative ACT criterion of their latest ACT score being at least 20 points, 307 (50.2% of all patients) achieved remission (see Fig E1 in the Online Repository at www.jaci-global.org). Noncumulative, individual remission criteria are shown in Table E1 (available in the Online Repository at www.jaci-global.org).

Patient characteristics for those achieving versus not achieving remission status are shown in Table II. The median age at diagnosis was lower for patients who achieved on-treatment clinical remission (28.0 vs 30.0 years for those not in remission [$P < .001$]), and the median duration of biologic use was longer for those in remission (41.7 vs 37.8 months [$P < 001$]). Compared with patients who did not achieve clinical remission, higher proportions of those who achieved remission had commercial insurance (69.4% vs 57.0% [$P = .003$]) and were employed (63.3% vs 44.2% [$P < .001$]). In addition, body mass index was lower (32.1 vs 34.3 kg/m^2 [$P < .001$]) among those achieving remission. Patient characteristics associated with remission using the alternative ACT criterion (most recent ACT score ≥ 20) demonstrated generally similar trends (see Table E2 in the Online Repository at www.jaci-global.org).

Patients who achieved on-treatment remission had a higher mean BEC, IgE level, and FENO level (not within 30 days of biologic or systemic corticosteroid use) than patients who did not achieve on-treatment remission. This relationship was observed for the primary analysis requiring having at least 50% of ACT scores be 20 points or higher and the sensitivity analysis requiring that the latest ACT score be at least 20 points (all $P < .001$ [Table III]). Patients who achieved on-treatment clinical remission were less likely to have comorbid depression, diabetes, gastroesophageal reflux disease, hypertension, or chronic obstructive pulmonary disease and more likely to have clinically relevant allergy or anxiety (all $P < .05$). Results obtained by using the alternative ACT criterion of latest ACT score being 20 points or higher were generally similar (see Table E3 in the Online Repository at www.jaci-global.org).

Patients who achieved on-treatment remission had a higher mean BEC, IgE level, and FENO level (not within 30 days of biologic or systemic corticosteroid use) than patients who did not achieve on-treatment remission. This relationship was observed for the primary analysis requiring at least 50% of ACT scores to be 20 points or higher and the sensitivity analysis requiring the latest ACT score to be 20 points or higher (all $P < .001$ [Table III]). Patients who achieved on-treatment clinical remission were less likely to have comorbid anxiety, depression, diabetes, gastroesophageal reflux disease, hypertension, or chronic obstructive pulmonary disease (all $P < .05$). Results obtained by using the alternative ACT criterion of latest ACT score being 20 points or higher were generally similar (see Table E3).

The cumulative frequency of patients who had achieved remission by any time (in months) after 12 months of biologic use and the prevalence of remission at monthly intervals are shown in Fig 2. The median time from biologic initiation to remission was 30.2 months (95% CI = 25.7-33.6 months). The point prevalence of remission increased from 22.3% in months 12 to 13 to 34.3% in months 47 to 48. This analysis assumed that any missing data for remission status carried forward from the last measurement; the results were similar when patients with missing data were removed from the analysis (data not shown). When the alternative ACT criterion was used, a similar pattern in on-treatment clinical remission prevalence over the study period was observed, with point prevalence of remission increasing from 21.0% at months 12 to 13 to 28.6% at months 47 to 48 (see Fig E2, *A* in the Online Repository at www.jaci-global.org).

TABLE II. Patient characteristics overall and by on-treatment clinical remission status

Characteristic	All patients (N = 611)	On-treatment clinical remission		*P* value
		Yes (n = 281)	No (n = 330)	
Age at screening (y)				
Mean (SD)	53.3 (13.2)	53.5 (13.3)	53.1 (13.0)	<.001
Median (range)	54.0 (18-83)	54.0 (18-83)	54.0 (18-81)	
Age at first asthma diagnosis (y)				
Mean (SD)	29.9 (20.5)	29.4 (21.2)	30.4 (19.9)	<.001
Median (range)	29.0 (0-79)	28.0 (0-79)	30.0 (0-73)	
Female (%)	73.8	71.2	76.1	.17
Body mass index (kg/m^2), mean (SD)	33.4 (8.7)	32.1 (8.1)	34.4 (9.1)	<.001
Race (%)*				.12
White	80.7	84.3	77.6	
Black	13.9	10.7	16.7	
Asian	1.0	1.4	0.6	
Other*	2.5	1.8	3.0	
Not reported	2.0	1.8	2.1	
Hispanic or Latino ethnicity (%)	5.4	4.6	6.1	.10
Residential area (%)				.12
Urban	26.8	26.0	27.6	
Rural	24.9	21.7	27.6	
Suburban	44.4	48.4	40.9	
Missing	3.9	3.9	3.9	
Insurance (%)				.003
Commercial	62.7	69.4	57.0	
Medicare	20.5	18.1	22.4	
Medicaid	9.7	5.3	13.3	
Uninsured	0.5	0.4	0.6	
Other†	6.5	6.4	6.7	
Missing	0.2	0.4	0.0	
Employment status (%)				<.001
Employed (full-time, part-time, or self-employed)	53.0	63.3	44.2	
Homemaker	3.4	3.9	3.0	
Full-time student	1.6	2.1	1.2	
Retired	18.8	18.5	19.1	
Disabled because of asthma	8.0	0.7	14.2	
Disabled because of a condition other than asthma	5.4	3.2	7.3	
Unemployed	6.2	4.3	7.9	
Missing	3.4	3.9	3.0	
Smoking history (%)				.10
Never	66.9	71.2	63.3	
Former	28.8	25.6	31.5	
Current	4.3	3.2	5.2	
Duration of biologic use (mo)				
Mean (SD)	39.6 (12.5)	41.1 (12.0)	38.4 (12.8)	<.001
Median (range)	39.9 (12-67)	41.7 (12-65)	37.8 (13-67)	
Biologic use in the 12 mo before enrollment (%)‡				
Benralizumab	25.7	27.8	23.9	.28
Mepolizumab	18.7	19.9	17.6	.46
Omalizumab	28.2	26.3	29.7	.36
Reslizumab	2.6	1.4	3.6	.09
Dupilumab	12.4	14.9	10.3	.08
Time between SA onset and first biologic receipt (days)				
Mean (SD)	1734.6 (2613.4)	1708.2 (2618.6)	1758.1 (2614.8)	<.001

SA, Severe asthma; *SD*, standard deviation.
*Other includes Asian, American Indian or Alaska Native, and Native Hawaiian or other Pacific Islander.
†Other includes other government insurance, and other insurance.
‡Multiple biologics can be reported.

ACAAI/AAAAI/ATS remission criteria

With use of the definition of on-treatment asthma remission proposed by the ACAAI, AAAAI, and ATS, 71.8% of patients with complete data had no SCS use for exacerbation or maintenance therapy; no exacerbation requiring a physician visit; no emergency department visit or hospitalization; and no missed work or school owing to asthma-related symptoms during a 12-month interval. Overall, 17.8% of all patients achieved clinical remission at any time on treatment (see Fig 3 in the Online Repository at www.jaci-global.org). The point prevalence of

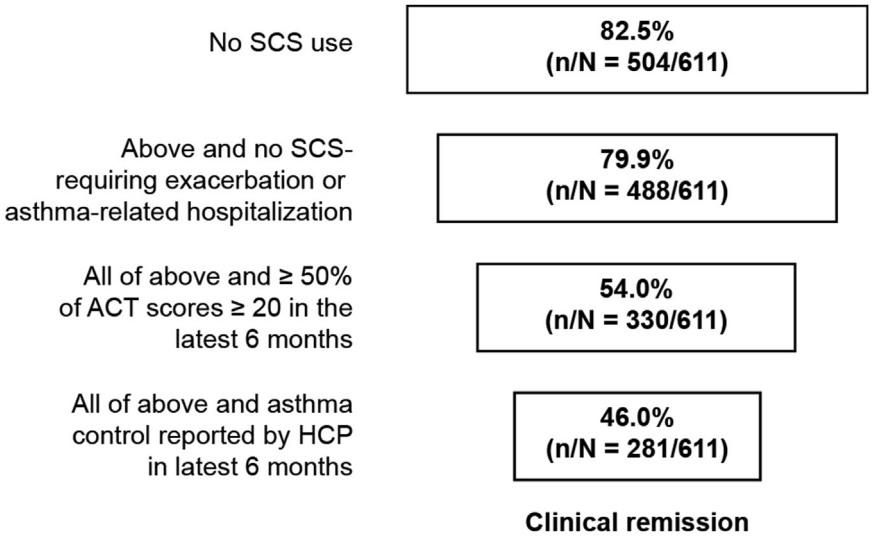

FIG 1. Proportion of patients who met cumulative criteria for on-treatment clinical remission in a 12-month interval. *HCP,* Health care professional.

TABLE III. Asthma biomarkers and comorbidities by on-treatment clinical remission status

Characteristic	All patients (N = 611)	On-treatment clinical remission		*P* value
		Yes (n = 281)	No (n = 330)	
BEC (cells/μL)*				
No.	278	126	152	
Mean (SD)	423.2 (622.3)	479.2 (583.7)	376.8 (650.8)	<.001
Median (range)	252.0 (0-6834.0)	304.8 (0-3989.7)	221.2 (0-6834.0)	
IgE level, (IU/mL)*				
No.	147	71	76	
Mean (SD)	401.1 (787.9)	421.3 (625.6)	382.3 (917.9)	<.001
Median (range)	142.0 (0.39-6775.1)	200.0 (0.39-3895.0)	102.5 (3.0-6775.1)	
FENO level (ppb)*				
No.	80	41	39	
Mean (SD)	38.9 (40.3)	45.2 (47.4)	32.2 (30.4)	<.001
Median (range)	23.5 (5.0-192.0)	24.0 (5.0-192.0)	23.0 (7.0-171.0)	
Comorbidities (%)				
Clinically relevant allergy	20.3	23.5	17.6	.070
Anxiety	15.5	11.7	18.8	.017
Depression	17.8	13.2	21.8	.005
Diabetes	11.3	7.1	14.8	.003
Gastroesophageal reflux disease	37.0	30.6	42.4	.003
Hypertension	29.3	23.8	33.9	.006
Atopic dermatitis or eczema	4.6	5.0	4.2	.66
Chronic obstructive pulmonary disease	9.8	4.6	14.2	<.001
Allergic rhinitis	59.6	61.6	57.9	.35

*Highest value before receiving any biologic or systemic corticosteroid.

remission was 10.5% in months 12 to 13 and 9.7% in months 47 to 48, remaining stable throughout the study period (see Fig 2, *B*). In a sensitivity analysis using an alternative ACT criterion of at least 50% of ACT scores being 20 points or higher during the 12 months (rather than requiring all ACT scores to be ≥ 20), 21.8% of all patients achieved remission during a 12-month interval.

DISCUSSION

This examination of clinical remission and associated patient characteristics in a real-world cohort of US subspecialist–treated patients with SA treated with biologics yielded several important findings. This study found that nearly one-half of patients with longer-term biologic use met the analysis definition for on-treatment clinical remission for at least one 12-month interval, and approximately 20% to 30% achieved remission at any specific 12-month interval, suggesting that clinical remission is a feasible treatment goal with biologic therapy in patients with SA. Additionally, with biologic use, most patients in this study had no exacerbations and no SCS treatment for a 12-month period. This finding underscores the effectiveness of biologics in reducing exacerbations in real-world settings in which patients are treated by subspecialists and continue biologic therapy for extended periods.

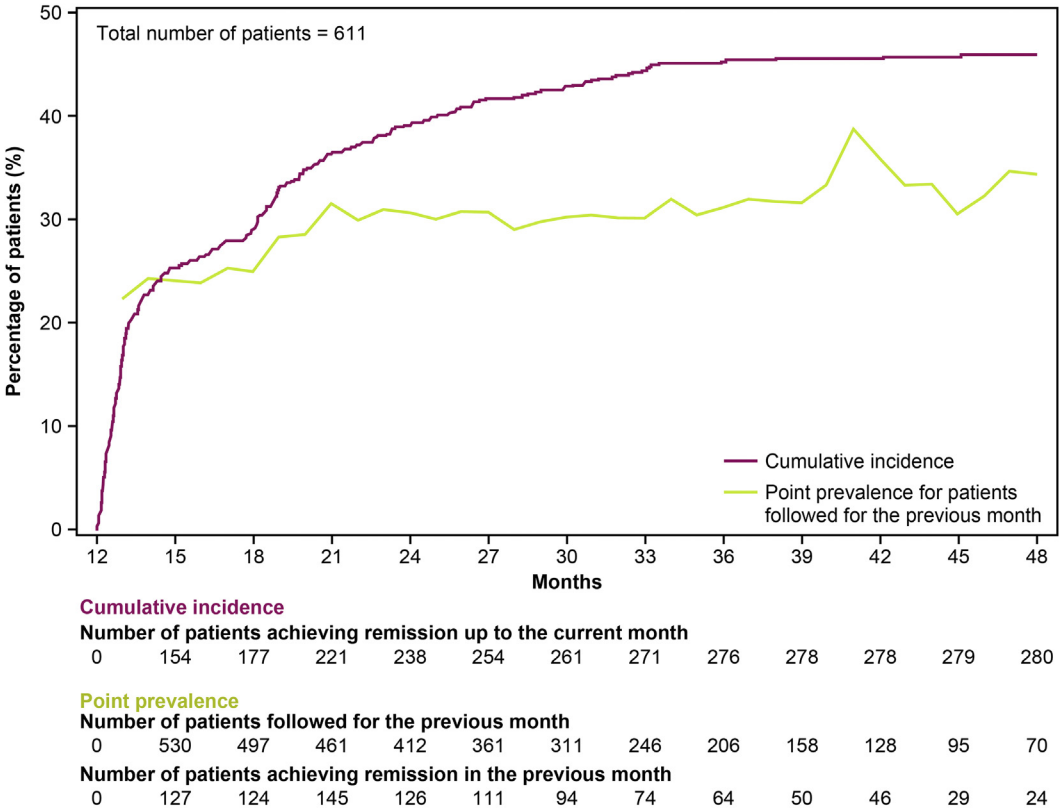

FIG 2. Percentage of patients achieving on-treatment clinical remission by month after 12 months of biologic use. Data after 48 months were not presented because too few patients had evaluable data after this point. For point prevalence, if a patient had a missing response for a specific time interval but was otherwise still being followed in the study, the response at the last time interval was carried forward.

Evidence of clinical remission has been demonstrated previously in *post hoc* analyses of data from phase 3 randomized clinical trials of biologic therapies for SA.[11,20] The definitions of remission in these analyses varied, but in general, the incidence of remission at 12 months was lower (14.5%-22.5% of patients)[11,20] than that observed in the current analysis. A lower incidence in 12-month randomized trials is expected given the shorter duration of treatment and high level of uncontrolled disease (ie, exacerbations during the prior year and poor symptom control) required at study enrollment. The longer duration of biologic treatment in the current cohort provides the opportunity for novel insights beyond those observed in randomized trials.

Real-world clinical remission has also been demonstrated previously in several studies outside the United States. In a Japanese study, the incidence of remission after 1 year of follow-up was 68.5%.[21] In an Italian study, the prevalences of asthma remission after a mean of 37.8, 13.5, 15.4, and 12 months of omalizumab, mepolizumab, benralizumab, and dupilumab treatments were 21.8%, 23.6%, 35.8%, and 23.5%, respectively.[22] In a Spanish observational study, 37% and 30% of patients newly prescribed mepolizumab achieved 3- and 4-component (ie, without or with lung function criteria) on-treatment clinical remission definitions after 1 year.[23] Lastly, in an analysis of Australian registry data, 29.3% and 22.8% of patients receiving mepolizumab and omalizumab, respectively, met the criteria for remission without lung function criteria. With lung function criteria, 25.2% and 19.1%, respectively, met the remission criteria.[24] The finding that 46% of patients in the current analysis achieved on-treatment clinical remission at any point and 22.3% and 34.3% of patients achieved remission at 12 to 13 and 47 to 48 months, respectively, aligns with observations outside of the United States and provides valuable results for a large and diverse population of US subspecialist–treated adults with SA.

This analysis also described several patient characteristics potentially associated with achievement of remission. Although duration of disease was similar in those achieving and not achieving remission, the median duration of biologic use was longer for those achieving remission. This difference suggests that there may be a long-term benefit of biologic use in reducing asthma-related inflammation. Alternatively, this difference could be explained by a selection bias whereby patients who respond to biologics are more likely to continue them. However, the long duration of biologic use in both groups (>4 years) may suggest that such a bias is not a major factor. The proportions of patients who had commercial insurance and were employed were higher among those who achieved clinical remission than among those who did not achieve remission, suggesting that social determinants of health play a role in patients' ability to achieve on-treatment clinical remission. The impact of social determinants of health on asthma development and progression is well documented.[25]

Adoption of on-treatment clinical remission as a treatment goal in SA might help improve long-term patient outcomes, similar to what has been achieved with treatment approaches targeting

clinical remission in other chronic inflammatory diseases such as RA, ulcerative colitis, and SLE.[13-15] Studies of patients with RA have found remission rates comparable to those in this study, as well as substantially higher rates for longer follow-up times at 7 years or 12 years.[26,27] Targeting on-treatment clinical remission versus asthma control sets a higher standard for treatment management to eliminate symptoms and reduce disease inflammation and activity.[28] Ultimately, controlling symptoms and being able to maintain normal activity levels are primary long-term goals of asthma treatment in addition to risk minimization.[1] Management of SA, including targeting on-treatment clinical remission, should be personalized to patients' needs and may include lifestyle and other nonmedication interventions.[1]

This analysis was limited to the assessment of clinical rather than complete remission, and therefore, it did not include biomarker measures as part of the remission criteria. In addition, as noted, lung function was not evaluated as a remission criterion owing to the limited number of repeat lung function assessments for enrolled patients. This observation itself is a relevant finding for determining the optimal assessments of clinical remission in clinical practice; it suggests that many specialists may not frequently repeat lung function in patients with SA treated with biologics as a part of routine clinical care. As a result, implementing a lung function component of clinical remission in asthma outside interventional clinical studies may not be practical. Evaluating repeat lung function testing is further complicated by limited performance consistency.[29] Despite the lack of lung function data in our assessment of remission, the requirement for asthma control based on ACT scores as well as on patient and specialist reports of asthma control helped to ensure that patients meeting our remission definition were not experiencing significant lung function impairment. Given the collection of monthly ACT scores in CHRONICLE, which does not reflect real-world practice, we examined an alternative rule for ACT scores deemed consistent with remission. It is reassuring that the incidence of remission was similar with use of the requirement that the patient's most recent ACT score be 20 points or higher, which is more viable in clinical practice. It was not possible to evaluate the potential impact of lifestyle and nonmedication interventions on clinical remission, as data on these factors are not systematically collected in CHRONICLE. Lastly, this analysis did not evaluate on-treatment clinical remission by individual SA biologics. Biologic therapies for asthma have been introduced at different time periods and for different patient populations (eg, with allergy, with eosinophilia), all of which may introduce bias in comparing individual biologics. As a result, to avoid this potential bias, the current analysis evaluated biologic use overall.

The current analysis is, to our knowledge, also the first to evaluate the ACAAI/AAAAI/ATS-proposed definition of on-treatment clinical remission with real-world data. The work group developed its criteria with the understanding that it was setting a "high bar" for achieving clinical remission.[19] With these more restrictive criteria, only 17.8% of patients achieved clinical remission at any point during the study observation period. The optimal, pragmatic definition of clinical remission in SA requires further study and refinement, as the proposed criteria are complex and must be tested in clinical practice.[30] It is our hope that this analysis and future analyses may help contribute to that longer-term objective.

Conclusions

Overall, 12 months or more of biologic therapy was associated with prevention of exacerbations and SCS treatment in a 12-month interval in nearly 3 of 4 patients with SA, and nearly one-half of patients met the criteria for on-treatment clinical remission. These results provide real-world evidence supporting clinical remission as a feasible disease management goal with biologic therapy use in SA and suggest that it may have value as a study end point in future studies of SA.

DISCLOSURE STATEMENT

This work and the CHRONICLE study were supported by AstraZeneca.

Disclosure of potential conflict of interest: B. E. Chipps reports serving on advisory boards and as a consultant and speaker for AstraZeneca, Boehringer Ingelheim, Genentech, GSK, Novartis, Regeneron, and Sanofi. N. Lugogo reports receiving consulting fees for advisory board participation from Amgen, AstraZeneca, Genentech, GSK, Novartis, Regeneron, Sanofi, and Teva; honoraria for non–speakers bureau presentations from AstraZeneca, GSK, and Niox; and travel support from AstraZeneca; in addition, her institution has received research support from Amgen, AstraZeneca, Avillion, Gossamer Bio, Genentech, GSK, Regeneron, Sanofi, and Teva. W. Carr reports serving as a speaker for AstraZeneca, Boehringer Ingelheim, Regeneron, Sanofi, and Teva and as a consultant for Aerocrine, Alcon Laboratories, AstraZeneca, Bausch Health, Baxalta, Boehringer Ingelheim, Circassia, CSL Behring, Genentech, Greer Laboratories, Grifols, GSK, Horizon Pharma, Kaleo, Meda, Novartis, Optinose, Pfizer, Regeneron, Sanofi, Takeda, Teva, and Viatris. W. Zhou is an employee of ClinChoice, Inc. A. Patel is a former employee and shareholder of AstraZeneca. D. D. Carstens, F. Trudo, and C. S. Ambrose are employees and shareholders of AstraZeneca.

Medical writing services were provided by Mahesh Chemudupati, PhD, and Anne Kangethe, PhD, of Oxford PharmaGenesis Inc (Newtown, Pa), which was in accordance with Good Publication Practice (GPP 2022) and funded by AstraZeneca, Wilmington, Delaware.

Clinical implications: This real-world study underscores the potential value and feasibility of on-treatment clinical remission with longer-term biologic treatment in patients with severe asthma.

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