# Abstract #183: Presentation and outcomes of cutaneous T-cell lymphoma following the use of dupilumab compared to other biologic therapies

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## Introduction

- Chronic benign inflammatory skin diseases, such as atopic dermatitis or psoriasis, may precede or clinically mimic cutaneous T-cell lymphoma (CTCL), obscuring a clear diagnosis
- Biologic therapies are becoming widely used for the treatment of chronic benign inflammatory skin diseases; however, recent reports have suggested that certain biologic agents may be associated with CTCL development[1]

## Objectives

- Primary objective: Assess the association between biologic therapies, used for the treatment of chronic benign inflammatory skin diseases, and CTCL outcomes in a diverse patient population at a tertiary referral center
- Secondary objective: Within the cohort of patients treated with biologic agents for chronic benign inflammatory skin diseases, assess CTCL outcomes of those treated with dupilumab exclusively and in conjunction with other biologic therapies

## Materials and Methods

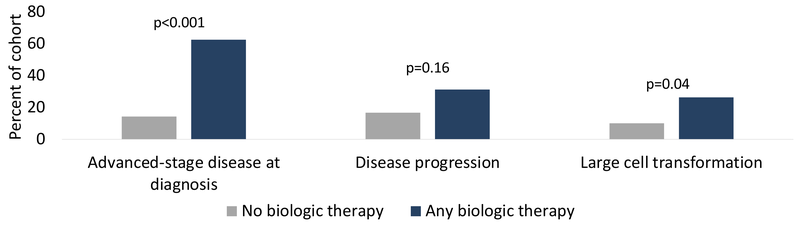
- We conducted a retrospective review of 148 patients seen at Johns Hopkins between January 2011 and July 2023, who were diagnosed with CTCL and had a documented history or working diagnosis of a chronic benign inflammatory skin disease at least two years prior to their diagnosis of mycosis fungoides or Sézary syndrome
- Nineteen patients underwent treatment with biologics, including adalimumab, apremilast, dupilumab, risankizumab, upadacitinib, and/or ustekinumab, for treatment of chronic benign inflammatory skin disease prior to CTCL diagnosis
- Patients treated with biologic agents were distributed into three cohorts: 1) treatment with only dupilumab 2) treatment with biologics other than dupilumab, and 3) treatment with a combination of dupilumab and other biologics
- Demographics and clinical characteristics of each cohort were summarized to assess comparability
- Advanced-stage disease is defined as stage IIB-IVB and disease progression is defined as any advancement in stage beyond stage at diagnosis
- Statistical analysis included tests of association, such as chi-squared and fisher exact test for categorical variables and ANOVA tests for continuous outcomes

## Results

**Table 1. Patient Demographics**

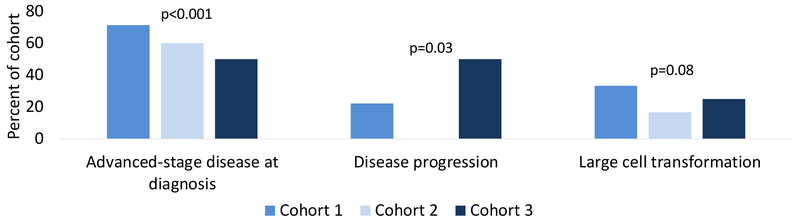
| Variables | No biologic therapy (n=129) | Any biologic therapy (n=19) | Dupilumab only (n=9) (Cohort 1) | Biologics other than dupilumab (n=6) (Cohort 2) | Combination of dupilumab and other biologics (n=4) (Cohort 3) |
|---|---|---|---|---|---|
| Age at diagnosis | | | | | |
| Median (SD) | 53 (15.9) | 64 (13.6) | 67 (14.5) | 61 (12.7) | 51 (11.2) |
| Sex, n (%) | | | | | |
| Female | 66 (51.2%) | 11 (57.9%) | 4 (44.4%) | 4 (66.7%) | 3 (75.0%) |
| Male | 63 (48.8%) | 8 (42.1%) | 5 (55.6%) | 2 (33.3%) | 1 (25.0%) |
| Race, n (%) | | | | | |
| White | 64 (49.6%) | 10 (52.6%) | 3 (33.3%) | 5 (83.3%) | 2 (50.0%) |
| Black | 65 (50.4%) | 9 (47.4%) | 6 (66.7%) | 1 (16.7%) | 2 (50.0%) |
| Other | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) |
| Median time from inflammatory skin disease onset to CTCL diagnosis in years (range) | 5 (2-38) | 5 (2-30) | 3 (2-15) | 6.5 (2-20) | 11 (5-30) |
| Median duration of treatment with biologic therapy in months (range) | N/A | 6.11 (0.8-83.2) | 6.0 (0.8-43.5) | 4.45 (1.4-9.33) | 16.03 (12.2-85.2) |

**Figure 1. CTCL prognostic outcomes compared in patients with and without a history of biologic therapy use for the treatment of chronic benign inflammatory skin disease**




Significantly higher incidences of advanced-stage disease at diagnosis and large cell transformation were observed in patients treated with biologic therapies for chronic benign inflammatory skin disease prior to their CTCL diagnosis.

**Figure 2. CTCL prognostic outcomes compared in patients who were treated with dupilumab (cohort 1), biologics other than dupilumab (cohort 2), or a combination of dupilumab and another biologic therapy (cohort 3) for treatment of chronic benign inflammatory skin disease**




Advanced-stage disease at diagnosis was observed at a significantly higher rate in patients treated exclusively with dupilumab. Disease progression after diagnosis was significantly higher in patients treated with dupilumab in combination with another biologic therapy.

## Conclusion

- Patients treated with biologic therapies prior to CTCL diagnosis may be at increased risk of advanced-stage disease or an aggressive CTCL phenotype.
- Particularly, patients treated with dupilumab may be at increased risk of poor prognostic disease. The use of other biologic therapies in addition to dupilumab may be associated with CTCL progression after diagnosis.
- A thorough clinical work up should be considered prior to initiating treatment with biologic agents for chronic benign inflammatory disease to establish a clear diagnosis and patients should be monitored throughout their treatment course for signs of disease transformation.

## Next Steps

- A multi-center study with a larger, more diverse cohort of patients will increase the statistical power and generalizability of these findings and may aid in identifying subpopulations at higher risk of developing CTCL or poor prognostic disease features following the use of biologic therapies
- Molecular investigations of biopsies prior to and after biologic use may uncover biomarkers that aid in discerning populations at greater risk of CTCL transformation following treatment with biologic therapies[2]

## References

1. Amitay-Laish I, Guenova E, Ortiz-Romero PL, Cristina VA, Rozati S, Geskin LJ, Nikolaou V, Papadavid E, Barzilai A, Pavlovsky L, Didkovsky E. The course of mycosis fungoides under cytokine pathway blockers: a multicentre analysis of real-life clinical data. *Acta Dermato-Venereologica*. 2020;100(16).
2. Joshi TP, Duvic M. Unmasking a masquerader: Mycosis fungoides unveiled after dupilumab treatment. *JAAD*. 2023.