Association Between Having a Diagnosis for Pruritus and Higher Healthcare Resource Utilization and Cost Among Patients Newly Initiating Systemic Therapy for Atopic Dermatitis: A Matched Case-Control Analysis of US Claims Data

Zirwas M[1], Princic N[2], Richards M[2], Qureshi A[3], **Sabatelli L**[4], Lio P[5]

[1]DOCS Dermatology, Probity Medical Research, and Ohio University, Bexley, OH, USA, [2]Merative, Ann Arbor, MI, USA, [3]Galderma, Boston, MA, USA, [4]Galderma, Zug, Switzerland,[5] Medical Dermatology Associates of Chicago, Chicago, IL, USA

OBJECTIVE

Describe and compare the healthcare resource utilization (HCRU) and costs in patients with AD during the year after initiation of the first systemic AD therapy and with evidence of an additional itch diagnosis versus matched control patients with AD also initiating the first systemic therapy but without evidence of an additional itch diagnosis.

CONCLUSIONS

- Patients with AD initiating systemic therapy that received a diagnosis of itch had significantly higher HCRU and costs over the 12 months following initiation of systemic therapy compared with matched controls of AD patients that did not receive an additional diagnosis of itch.
- All patients with AD suffer from itch although it may not be directly coded on medical claims. Receiving an additional itch diagnosis may be indicative of higher morbidity and overall burden of disease leading to increased HCRU and costs for the AD cohort with an additional diagnosis of itch (vs matched controls).
- While further research on the burden of itch is needed, these study results suggest that having diagnosed itch significantly increases the overall economic burden associated with AD.

LIMITATIONS

- Results of this analysis may not be generalizable to patients with types of health insurance other than commercial, or employer sponsored Medicare (e.g., Medicaid) or those without health insurance.
- The MarketScan Research Databases rely on administrative claims data which are subject to data coding limitations and data entry error resulting in potential misclassification of variables.
- There may be systematic differences between the AD itch diagnosed cohort and controls that could account for some of the differences found in healthcare costs. While some characteristics were controlled for through matching, adjustment was limited to those characteristics that could be measured using administrative claims.

DISCLOSURES:

Authors NP and MR are employed by Merative. LS and AQ are employed by and own shares of Galderma. PL and MZ are consultants for Galderma. This study was funded by Galderma.

REFERENCES:

1. Frazier W, Bhardwaj N. Atopic dermatitis: Diagnosis and treatment. Am-Fam-Physician. 2020;101(10):590-598.
2. Rosenbaum PR, Rubin DB. The central role of the propensity score in observational studies for causal effects. Biometrika. 1983;70(1):41-55.
3. Austin PC. Balance diagnostics for comparing the distribution of baseline covariates between treatment groups in propensity-score matched samples. Statistics in medicine. 2009;28(25):3083-3107.

INTRODUCTION

- Atopic dermatitis (AD) is a common, chronic, inflammatory skin disease characterized by severe, persistent itch and skin lesions (red, dry patches of skin, rashes that may ooze, weep clear fluid, or bleed when scratched), and is classified based on the intensity of symptoms and proportion of skin impacted.[1]
- The treatment landscape for patients with AD who do not respond to topical therapies is evolving rapidly with the approval of new systemic treatments, including biologics and JAK inhibitors
- There is a paucity of recent data examining the burden of itch, the most severe symptom experienced by patients with AD, in real-world settings

METHODS

DATA SOURCES

- This retrospective analysis utilized US administrative claims data from the Merative MarketScan® Commercial and Medicare Database collected from January 01, 2016–June 30, 2023, which includes employer and health plan-sourced medical and outpatient pharmacy claims.
- All data analyses were conducted using SAS version 9 (SAS inc., Cary, NC, USA) and R Statistical Software (R Core Team, 2024).

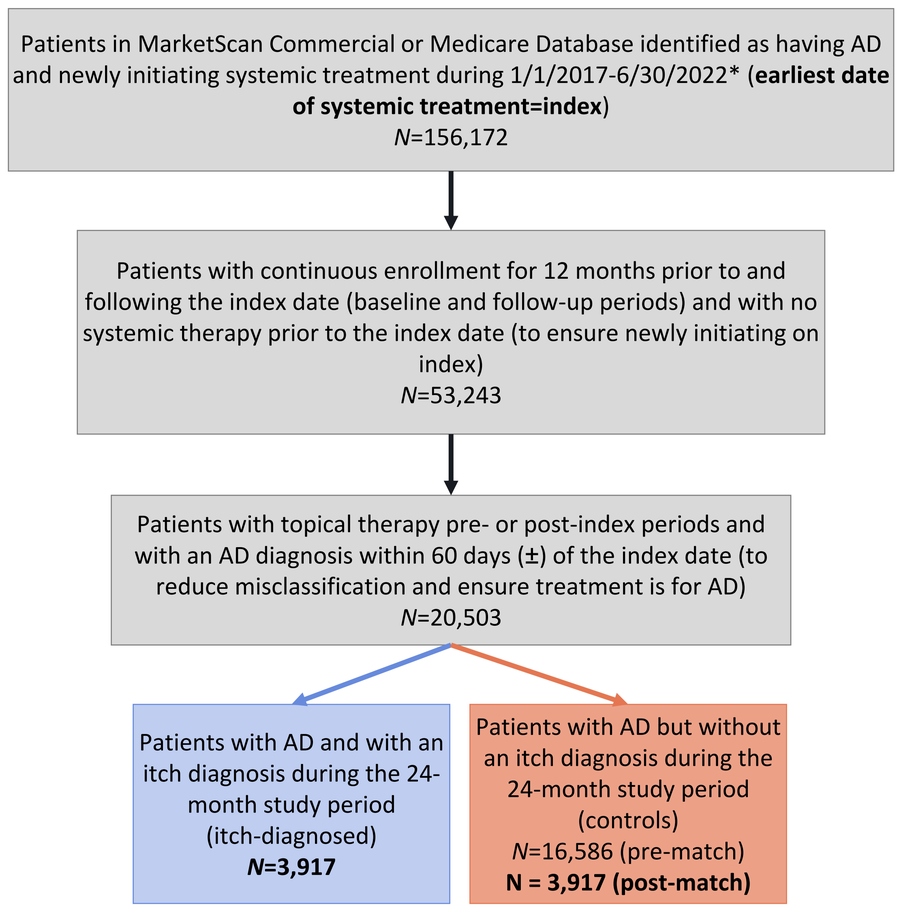
PATIENT IDENTIFICATION AND MATCHING

- Patients with AD (ICD-10-CM L20.xx) who newly initiated systemic therapy (earliest date of treatment = index) were identified during a selection window from January 1, 2017 – June 30, 2022, and study outcomes were measured during a fixed 12-month post-index period (Figure 1).
- Eligible patients with AD with an additional claim with a diagnosis of itch (ICD-10-CM L29.x) during the 12-month baseline or follow-up were identified and matched 1:1 to those without an additional diagnosis for itch using propensity score analysis.[2]
- Demographic and chronic clinical conditions were included in the propensity model based on baseline imbalances.
- Chronic clinical conditions and demographic characteristics that were imbalanced during baseline, and therefore included in the matching, were age, Deyo-Charlson comorbidity index, cardiovascular disease, type 2 diabetes, and any mental health disorder.
- To assess balance, the standardized mean difference (SMD) was calculated. The SMD is a function of mean values and standardized deviations in the cases and control group. An absolute value ≤0.10, is an indicator of good balance.[3]

OUTCOMES

- HCRU and costs (overall and by service category) during the 12-month follow-up period were compared for AD patients with and without a claim with a diagnosis code with any evidence of itch (ICD-10-CM L29.x) after matching (itch diagnosed vs controls).
- Costs were calculated using paid amounts of adjudicated claims, including insurer and health plan payments, as well as patient cost-sharing in the form of copayment, deductible, and coinsurance; costs were adjusted to 2022 dollars using the medical care component of the Consumer Price Index.

Figure 1. Patient Selection



* Patients with AD were identified as those patients with ≥2 non-diagnostic claims for AD (ICD-10-CM L20.xx) at least 30 days apart and had at least one systemic treatment for AD (index = earliest date of systemic treatment). Systemic treatments included oral corticosteroids, systemic immunosuppressants, and biologics or JAK-inhibitors. Non-diagnostic claims are claims that are not for laboratory tests, radiology or other diagnostic procedures (i.e., claims more likely to be used to rule-out a condition).
AD, atopic dermatitis

RESULTS

- There were 3,917 itch-diagnosed patients and matched control patients eligible after matching (mean/median age 30.5/27 and 30.3/26; 58.6% and 56.6% female; mean Deyo Charlson comorbidity score 0.41, 0.39).
- After matching, itch-diagnosed patients and controls were well balanced (SMD < 0.10) on demographic characteristics and most chronic comorbid conditions not directly associated with itch measured in the baseline period (Table 1).

Table 1. Patient Characteristics Measured on Index

	Matched Cohorts		
	Itch-Diagnosed N=3,917	Controls N=3,917	SMD
Age, mean (SD)	30.5 (23.2)	30.3 (23.1)	0.01
Sex, N (%)			
Male	1,620 (41.4%)	1,700 (43.4%)	0.04
Female	2,297 (58.6%)	2,217 (56.6%)	0.04
Payer, N (%)			
Commercial	3,636 (92.8%)	3,641 (93.0%)	0.00
Medicare supplemental	163 (4.2%)	179 (4.6%)	0.02
Medicare Advantage	118 (3.0%)	97 (2.5%)	0.03
Insurance plan type, N (%)			
Comprehensive/indemnity	164 (4.2%)	175 (4.5%)	0.01
EPO/PPO	1,937 (49.5%)	1,931 (49.3%)	0.00
POS/POS with capitation	271 (6.9%)	268 (6.8%)	0.00
HMO	544 (13.9%)	568 (14.5%)	0.02
CDHP/HDHP	941 (24.0%)	923 (23.6%)	0.01
Other/Unknown	60 (1.5%)	52 (1.3%)	0.02
Geographic region, N (%)			
New England	109 (2.8%)	135 (3.5%)	0.04
Middle Atlantic	440 (11.2%)	476 (12.2%)	0.03
East North Central	489 (12.5%)	595 (15.2%)	0.08
West North Central	111 (2.8%)	128 (3.3%)	0.03
South Atlantic	1,401 (35.8%)	1,347 (34.4%)	0.03
East South Central	329 (8.4%)	301 (7.7%)	0.03
West South Central	421 (10.8%)	392 (10.0%)	0.02
Mountain	190 (4.9%)	201 (5.1%)	0.01
Pacific	424 (10.8%)	334 (8.5%)	0.08
Unknown	3 (0.1%)	8 (0.2%)	0.03
Index year, N (%)			
2017	660 (16.9%)	724 (18.5%)	0.04
2018	733 (18.7%)	750 (19.2%)	0.01
2019	793 (20.3%)	760 (19.4%)	0.02
2020	655 (16.7%)	606 (15.5%)	0.03
2021	740 (18.9%)	731 (18.7%)	0.01
2022	336 (8.6%)	346 (8.8%)	0.01
DCI, Mean (SD)	0.4 (1.0)	0.4 (0.9)	0.03
Components of the DCI, N(%)			
Myocardial infarction	14 (0.4%)	11 (0.3%)	0.01
Congestive heart failure	41 (1.1%)	37 (0.9%)	0.01
Peripheral vascular disease	51 (1.3%)	55 (1.4%)	0.01
Cerebrovascular disease	48 (1.2%)	49 (1.3%)	0.00
Chronic pulmonary disease	562 (14.4%)	560 (14.3%)	0.00
Dementia	13 (0.3%)	11 (0.3%)	0.01
Diabetes (mild to moderate)	217 (5.5%)	228 (5.8%)	0.01
Diabetes with chronic complications	77 (2.0%)	66 (1.7%)	0.02
Chronic renal disease	68 (1.7%)	62 (1.6%)	0.01
Hemiplegia or paraplegia	4 (0.1%)	7 (0.2%)	0.02
Mild liver disease (various cirrhosis)	47 (1.2%)	49 (1.3%)	0.00
Moderate or severe liver disease	5 (0.1%)	1 (0.0%)	0.04
Peptic ulcer disease	15 (0.4%)	13 (0.3%)	0.01
Rheumatologic disease	56 (1.4%)	39 (1.0%)	0.04
Metastatic solid tumor	10 (0.3%)	8 (0.2%)	0.01
Any other malignancy	95 (2.4%)	90 (2.3%)	0.01
HIV	15 (0.4%)	7 (0.2%)	0.04
Other chronic conditions			
Autoimmune disease	255 (6.5%)	237 (6.1%)	0.02
COPD	49 (1.3%)	44 (1.1%)	0.01
Cognitive impairment	8 (0.2%)	9 (0.2%)	0.01
End-stage renal disease	7 (0.2%)	2 (0.1%)	0.04
Epilepsy	24 (0.6%)	26 (0.7%)	0.01
Metabolic/cardiovascular disease	758 (19.4%)	762 (19.5%)	0.00
Pneumonia	59 (1.5%)	83 (2.1%)	0.05
Mental health disorders	681 (17.4%)	676 (17.3%)	0.00

COPD, chronic obstructive pulmonary disease; DCI, Deyo Charlson comorbidity index; HIV, human immunodeficiency virus; SMD, standardized mean difference

- Compared with matched controls, during the 12-month follow-up period itch-diagnosed patients with AD were more likely to have an inpatient admission (4.8% vs 3.7%; p<0.05), had a higher mean number of prescriptions (23.0 vs 19.6; p<0.001) and had a higher number of physician office visits (10.9 vs 8.9; p<0.001; Figure 2)
- Consistent with the higher HCRU, itch-diagnosed patients with AD (versus controls) incurred on average higher medical ($9,009 vs $7,351; p<0.05) and total healthcare costs ($20,207 vs $15,608; p<0.001) after matching (Figure 3).
- The incremental difference in total costs was $4,599 (difference in medical costs was $1,658 and difference in pharmacy costs was $2,940) with pharmacy costs being the primary driver of the differences between cohorts (Figure 3).

Figure 2. HCRU in the AD with itch-diagnosis cohort vs. the matched AD without itch diagnosis control cohort during the 12-month follow-up period

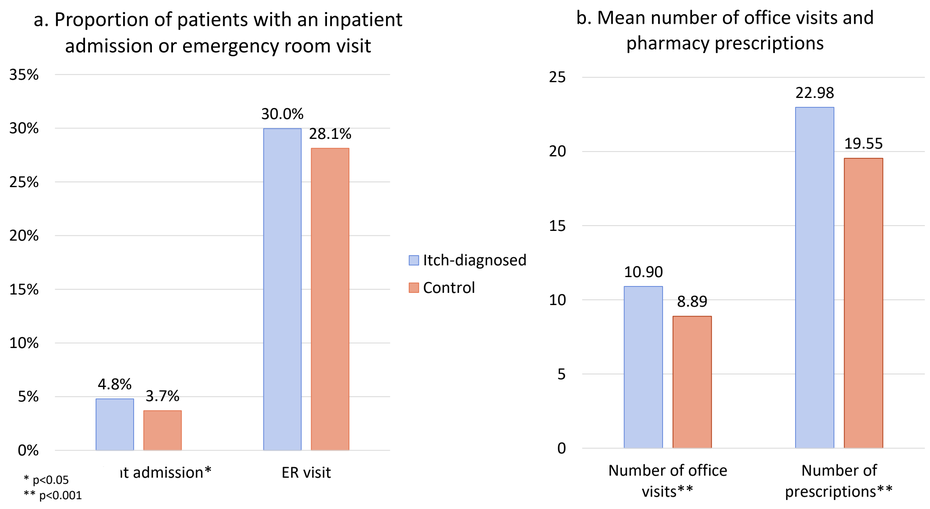


Figure 3. Healthcare costs in the AD with itch-diagnosis cohort vs. the matched AD without itch diagnosis control cohort during the 12-month follow-up period