Clinical Profiles and Treatment Patterns of Severe Atopic Dermatitis Patients Treated with Biologics or JAK Inhibitors : A Single-Center study in Korea

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- **Learning Objective:** To identify phenotype-based factors influencing treatment selection and response in patients with severe atopic dermatitis
- **Takeaway Message:** Both disease phenotype and severity play key roles in guiding personalized treatment for severe atopic dermatitis
- **Conflict of Interest:** The authors declare no conflicts of interest
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Introduction

- **Atopic dermatitis(AD)**
  - Chronic relapsing pruritic inflammatory skin disease characterized by heterogeneous clinical phenotypes and significant disease burden
  - Biologics and JAK inhibitors have transformed treatment options for severe AD
  - RCTs show efficacy and safety, but real-world data on treatment selection remain limited
- **Treatment decision-making in severe AD**
  - Clinical choices may depend on disease severity, comorbidities, and affected area
  - Asian data regarding phenotype-based prescribing preferences are still lacking
- **Purpose of this study**
  - To investigate clinical characteristics and treatment patterns of severe AD patients treated with biologics or JAK inhibitors
  - To identify predictors of treatment selection and response in a real-world

Materials and methods

- **Study population**
  - Retrospective chart review study
  - Total of 106 adult patients (≥18 years) with severe AD (baseline EASI ≥23)
  - Patients received biologics (dupilumab, tralokinumab) or JAK inhibitors (upadacitinib, baricitinib)
  - Follow-up period: ≥1 year at a single dermatology clinic (Soonchunhyang University Bucheon Hospital)
- **Study variables**
  - Age, sex, age of onset (child vs adult), baseline EASI, BSA, IgE
  - Phenotypes : Lichenoid/hyperkeratosis, follicular/popular dermatitis, nummular eczema, prurigo nodularis, erythrodermic)
  - Site involvement (Head/neck, hand/foot, and genital)
  - Treatment history: Itraconazole administration
- **Statistical analysis**
  - Rex software (ver.3.7; RexSoft Inc., Seoul, Korea)
  - Logistic regression to evaluate predictors of treatment selection and response
  - Student's t-test for group comparisons (mean EASI between biologics and JAK inhibitor groups)
  - P-value <0.05 considered statistically significant

Results

- **A total of 106 patients with severe AD were analyzed.**
  - **Treatment distribution**
    - **Dupilumab was the most frequently prescribed therapy (64, 60.4%), followed by upadacitinib (21, 19.8%), baricitinib (15, 14.2%), and tralokinumab (6, 5.7%)**
  - **Age of onset**
    - **The majority of patients experienced childhood-onset AD (73, 68.9%)**
  - **Immunologic profile**
    - **Serum IgE levels were markedly elevated, with 51 patients (46.4%) showing levels above 1000 IU/mL (≥5000 IU/mL in 32 patients)**
  - **Clinical involvement**
    - **Head and neck involvement was observed in 89 patients (84.0%), and hand/foot involvement in 62 patients (57.5%)**
  - **Phenotypic variants**
    - **Lichenoid/hyperkeratotic lesions (76, 71.7%), nummular eczema–like phenotype (90, 75.0%), Follicular/popular dermatitis (30, 25.0%), and prurigo nodularis (14, 11.7%)**

Results

Table 1. Baseline characteristics of patients with severe AD (n=106)

Variable	Category	n (%)
Treatment	Dupilumab	64 (60.4)
	Tralokinumab	6 (5.7)
	Upadacitinib	21 (19.8)
	Baricitinib	15 (14.2)
Sex	Male	76 (71.7)
	Female	30 (28.3)
Onset	Chilhood	73 (68.9)
	Adult	33 (31.1)
IgE level	< 100	13 (12.3)
	100-1000	42 (39.6)
	1000-5000	19 (17.9)
	5000 <	32 (30.2)
Phenotypes	Lichenoid/hyperkeratosis	76 (71.7)
	Follicular/popular dermatitis	30 (25.0)
	Nummular eczema	90 (75.0)
	Prurigo nodularis	14 (11.7)
Itraconazole history	Yes	39 (32.5)
	No	81 (67.5)

Note: Values are presented as n (%).
Abbreviations: AD, atopic dermatitis

Results

Table 2. Distribution of clinical involvement sites in severe AD (n=106)

Involvement	Category	n (%)
Head & Neck	Yes	89 (84.0)
	No	17 (16.0)
Hand & Foot	Yes	61 (57.5)
	No	45 (42.5)
Periorbital	Yes	65 (61.3)
	No	41 (38.7)
Perioral	Yes	34 (32.1)
	No	72 (67.9)
Genital	Yes	8 (7.5)
	No	98 (92.5)

Note: Values are presented as n (%).
Abbreviations: AD, atopic dermatitis

Results

- **Baseline severity comparison**
  - **Mean baseline EASI was higher in the Biologics group than in the JAK inhibitors group**

Table 3. Comparison of baseline EASI between treatment groups

Group	Mean baseline EASI	Mean difference	p-value
Biologics	26.37	2.83	0.0244
JAK inhibitors	23.54		

Note: Mean difference and p-value were calculated using Student's t-test.

- **Baseline EASI and treatment choice**
  - **Logistic regression analysis showed that higher baseline EASI was independently associated with Biologics use**

Table 4. Logistic regression analysis of baseline EASI and treatment choice

Variable	OR (Biologics odds)	95% CI	p-value
Baseline EASI	1.22	1.10 - 1.36	0.0003

Note: Odds ratios are calculated for the likelihood of receiving biologics. OR > 1 indicates preference for biologics.

Results

- **Phenotype and treatment choice**
  - **JAK inhibitors were favored for patients with the lichenoid/hyperkeratotic phenotype**
  - **Other phenotypes, including follicular/popular dermatitis, nummular eczema, and prurigo nodularis, did not show significant associations with treatment choice.**

Table 5. Logistic regression analysis of phenotype and treatment response

Variable	OR (JAK odds)	95% CI	p-value
Lichenoid/Hyperkeratosis	3.03	1.27 - 7.14	0.013

Note: Odds ratios are calculated for the likelihood of achieving response with JAK inhibitors. OR > 1 indicates increased odds of response.

Discussion

- **Baseline severity and treatment choice**
  - **Higher baseline EASI was significantly associated with the use of biologics (OR=1.22, p<0.001)**
  - **In this study, more patients were treated with dupilumab, as it was launched earlier in Korea and is reimbursed for severe AD**
  - **Patients with lower baseline EASI may not be eligible for reimbursement → JAK inhibitors (lower cost) more often chosen**

    → potential selection bias
- **Phenotype and treatment preference**
  - **Patients with lichenoid/hyperkeratotic phenotype were more frequently treated with JAK inhibitors (OR=3.03, p=0.013)**
  - **Suggests that clinicians tend to consider clinical phenotype as an important factor when selecting treatment agents**

Discussion

- **Biologics vs JAK inhibitors**
  - **Biologics (Dupilumab, Tralokinumab, Lebrikizumab)**

  → Durable efficacy, favorable long-term safety
  - **JAK inhibitors (Upadacitinib, Baricitinib, Abrocitinib)**

  → Broad cytokine suppression (IL-4, IL-13, IL-22, IL-31, IFN-γ) → Rapid itch control, efficacy[1] [2]
- **Immunological rationale**
  - **Lichenoid/hyperkeratotic AD often exhibits Th17/Th22 skewing, hyperkeratosis, and barrier dysfunction[4]**
  - **JAK inhibitors provide broader coverage by blocking multiple cytokine pathways simultaneously**

Conclusion

- **Treatment patterns**
  - **Biologics were preferentially prescribed in patients with higher baseline EASI scores, reflecting their role in more severe disease**
  - **JAK inhibitors were favored in patients with lichenoid/hyperkeratotic phenotype and hand/foot involvement, due to broader cytokine inhibition and rapid itch relief**
- **Strength and limitations**
  - **Included severe AD (EASI ≥23) with ≥1 year follow-up → long-term real-world data**
  - **Provided insight into potential clinical biomarkers for treatment responders**
  - **Reflected treatment patterns and preferences in Korea → region-specific evidence**

  → These findings support a personalized, phenotype- and severity-driven approach in AD management
- **Limitations**
  - **Retrospective, single-center design**
  - **Clinical phenotype classification via chart review → potential inter-observer bias**
  - **No biomarker/endotype data**

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