IGAxBSA: a simple practice-friendly alternative to the Eczema Area and Severity Index (EASI) for assessing severity of pediatric atopic dermatitis

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Disclosures

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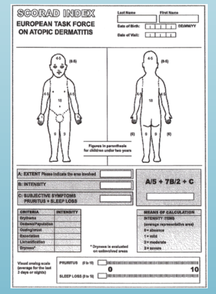
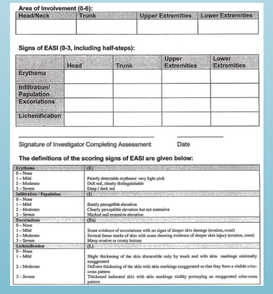
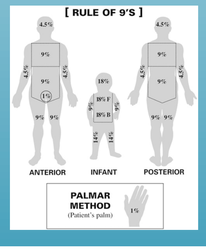
Introduction

- Disease severity assessment is important in directing treatment in atopic dermatitis (AD).
- The Eczema Area and Severity Index (EASI) and SCORing Atopic Dermatitis (SCORAD) have been recommended as the core outcome measures for assessing severity, but is complicated, time-consuming, and unsuited for clinical usage.[1]
- The Investigator Global Assessment (IGA) offers a rapid assessment that maps to easy-to-understand terms, is easily interpreted by both clinicians and patients, and has recently been validated, but it does not include disease extent.[2]
- For psoriasis disease severity, PGAxBSA, the product of the Physician Global Assessment (PGA) and Body Surface Area (BSA) is strongly correlated with PASI, similarly able to capture changes in disease severity, quickler, simpler, and more sensitive in patients with mild disease (BSA<10%). PGAxBSA is being touted as a potential alternative for PASI in clinical practice.[3]
- A similar measure for pediatric AD has yet to be evaluated.





Score	Morphological Description
0 – Clear	No inflammatory signs of atopic dermatitis (no erythema, no induration/papulation, no lichenification, no oozing/crusting). Post-inflammatory hyperpigmentation and/or hypopigmentation may be present.
1 – Almost clear	Barely perceptible erythema, barely perceptible induration/papulation, and/or minimal lichenification. No oozing or crusting.
2 – Mild	Slight but definite erythema (pink), slight but definite induration/papulation, and/or slight but definite lichenification. No oozing or crusting.
3 – Moderate	Clearly perceptible erythema (dull red), clearly perceptible induration/papulation, and/or clearly perceptible lichenification. Oozing and crusting may be present.
4 – Severe	Marked erythema (deep or bright red), marked induration/papulation, and/or marked lichenification. Disease is widespread in extent. Oozing or crusting may be present.



Objectives

- To evaluate the product of the Investigator Global Assessment and body surface area (IGAxBSA) as an easy-to-use alternative for EASI in pediatric AD.
- To suggest possible severity strata for IGAxBSA .

Methods

- 195 caretaker/child dyads were recruited at the Ann and Robert H. Lurie Children's Hospital allergy and dermatology clinics, as well as from the National Eczema Association's Eczema Expo in Chicago, IL from June 21-24, 2018.
- Demographics, medical information, disease severity measures, and patient-reported outcomes were captured including vIGA[2], BSA, EASI[4], SCORing Atopic Dermatitis (SCORAD), Patient Oriented Eczema Measure (POEM), Children's Dermatology Life Quality Index (CDLQI),[7] Itch Numerical Rating Scale (Itch NRS),
- Scatterplot and Bland-Altman plots were used to visually compare IGAxBSA with EASI. In both plots, IGAxBSA was rescaled by a constant factor of 5.556 (scale 0-400) in order to make comparable to EASI (scale 0-72).
- An anchor-based approach to severity strata was applied to IGAxBSA, with EASI as the anchor.

Table 1. Participant Characteristics and Mean Disease Assessment Scores by EASI Severity.

		Severity by EASI		
	Total Participants	Mild (≤7)	Moderate (7.1-21)	Severe (>21)	P
Size of group (n)	195	46	95	54	
Gender (n, %)					
Male	81 (41.5)	14 (30.4)	44 (46.3)	23 (42.6)	.197
Age in years at enrollment, mean (SD)	10.3 (3.5)	10.5 (3.7)	10.3 (3.5)	10.1 (3.5)	.889
Ethnicity (n, %)					
Hispanic	43 (22.1)	14 (30.4)	17 (17.9)	12 (22.2)	.242
Race (n, %)					
White Alone	74 (37.9)	17 (37.0)	37 (38.9)	20 (37.0)	.478
Black Alone	44 (22.6)	9 (19.6)	26 (27.4)	9 (16.7)	
Asian Alone	36 (18.5)	7 (15.2)	18 (18.9)	11 (20.4)	
Other	30 (15.4)	11 (23.9)	9 (9.5)	10 (18.5)	
Two or More Races	11 (5.6)	2 (4.3)	5 (5.3)	4 (7.4)	
IGA, mean (SD)	3.0 (.75)	2.1 (.64)	3.0 (.47)	3.6 (.53)	<.001
oSCORAD, mean (SD)	37.4 (15.4)	21.8 (10.0)	36.8 (10.4)	51.7 (13.2)	<.001
SCORAD, mean (SD)	47.0 (18.2)	27.7 (11.1)	46.5 (11.6)	64.3 (15.3)	<.001
POEM, mean (SD)	14.5 (7.3)	9.6 (6.2)	14.5 (6.5)	18.6 (7.1)	<.001
CDLQI score, mean (SD)	9.5 (7.2)	6.2 (5.5)	9.2 (6.6)	13.0 (8.0)	<.001
IGAxBSA, mean (SD)	92.2 (80.3)	16.0 (12.1)	74.4 (33.8)	188.5 (79.9)	<.001

Figure 2. Scatterplot and Bland-Altman Plot of Rescaled IGAxBSA (0-72) and EASI

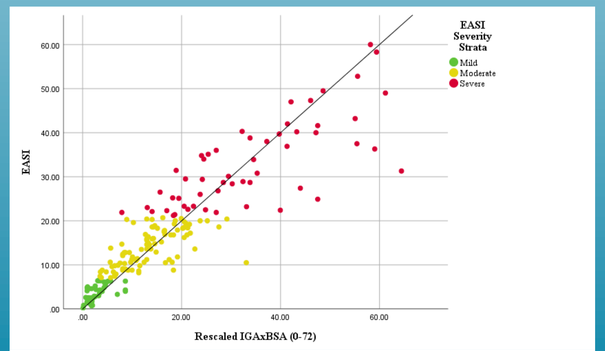


Figure 3. Bland-Altman Plot of Rescaled IGAxBSA (0-72) and EASI

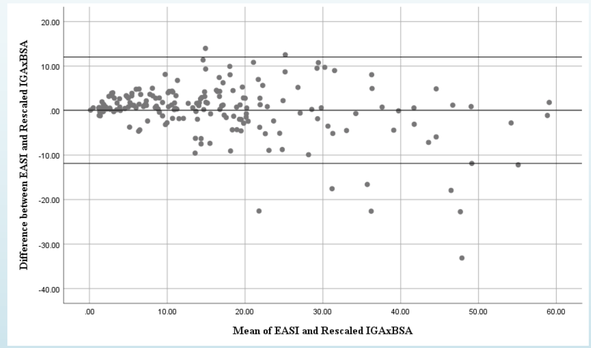


Table 1. Heatmap of Correlation Coefficients (Spearman Rho) between Disease Measures.

	IGAxBSA	IGA	EASI	oSCORAD	SCORAD	POEM (Proxy)	POEM (Child)*	Itch NRS (Proxy)	Itch NRS (Child)*	CDLQI (Proxy)	CDLQI (Child)*
IGAxBSA		0.821	0.924	0.775	0.774	0.449	0.417	0.332	0.388	0.354	0.327
IGA	0.821		0.757	0.711	0.736	0.445	0.38	0.43	0.428	0.39	0.29
EASI	0.924	0.757		0.78	0.779	0.426	0.452	0.313	0.415	0.347	0.36
oSCORAD	0.775	0.711	0.78		0.964	0.387	0.413	0.268	0.321	0.32	0.272
SCORAD	0.774	0.711	0.78	0.964		0.477	0.526	0.414	0.445	0.392	0.383
POEM (Proxy)	0.449	0.445	0.426	0.387	0.477		0.649	0.5	0.649	0.651	0.5
POEM (Child)*	0.417	0.38	0.452	0.413	0.526	0.649		0.46	0.507	0.634	0.716
Itch NRS (Proxy)	0.332	0.43	0.313	0.268	0.414	0.5	0.46		0.575	0.411	0.612
Itch NRS (Child)*	0.388	0.428	0.415	0.321	0.445	0.649	0.716	0.575		0.645	0.455
CDLQI (Proxy)	0.354	0.39	0.347	0.32	0.392	0.651	0.634	0.411	0.645		0.513
CDLQI (Child)*	0.327	0.29	0.36	0.272	0.383	0.5	0.507	0.612	0.455	0.513	

0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1

All correlations have p-values <.001. N=195 unless noted
*N=140

Table 2. Proposed IGAxBSA strata with EASI as anchor variable.

Mild	Moderate	Severe	K coefficient of agreement	P
0-25	25.1-125	125.1-400	.725	<.001
0-25	25.1-130	130.1-400	.733	<.001
0-25	25.1-135	135.1-400	.714	<.001
0-30	30.1-130	130.1-400	.760	<.001
0-35	35.1-130	130.1-400	.731	<.001

Results

- IGAxBSA correlated significantly more strongly with EASI than IGA (vIGA) alone with EASI (r=0.924 vs. r=0.757; p<.001,).
- IGAxBSA correlated almost as well with the physician-assessed oSCORAD (r=0.77, p<.001) and SCORAD (r=0.774, p<.001) and comparably with EASI and these measures (r=0.780 and r=0.779, p<.001, respectively).
- Correlations with POEM (r=0.449, p<.001), Itch NRS (r=0.332, p<.001), and CDLQI (r=0.354, p<.001) were significant, but not as strong.
- Using the anchor-based approach, possible thresholds of IGAxBSA were determined by observing when the mean, median, and mode EASI score corresponded with the EASI threshold values (Mild/Moderate, 7; Moderate/Severe, 21).
- An IGAxBSA severity strata of mild, 0-30; moderate, 30.1-130; and severe, 130.1-400 had the highest Kappa coefficient (κ=.760, p=<.001).

Conclusion

- IGAxBSA had a significantly stronger correlation with EASI than IGA alone that remained consistent across increasing severity, as evidenced by the scatterplot and Bland-Altman plot.
- IGAxBSA can be stratified into severity scores as mild (0-30), moderate (30.1-130), and severe (130.1-400), and these strata had higher agreement with current EASI strata than IGA alone.
- Disease severity strata using IGAxBSA may be useful in clinical practice to direct disease-appropriate therapy.
- IGAxBSA also correlates well with other objective AD severity measures, oSCORAD and SCORAD.
- IGAxBSA has low-to-moderate correlation with patient-reported outcomes such as POEM and Itch NRS.
- Similarly, all objective measures showed low-to-moderate correlation with CDLQI
- IGAxBSA could serve as a quick, simple, and easy-to-interpret alternative to EASI, particularly in clinical practice.

References

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