

Agreement Between Dermatologic and Pediatric Researchers in Scoring of Atopic Dermatitis in Children

Abstract: The Scoring of Atopic Dermatitis (SCORAD) index is a widely applied instrument for measuring the severity of atopic dermatitis (AD), but few studies have evaluated the interobserver agreement between different disciplines. A cross-sectional study of 21 children with AD evaluated by dermatology and pediatric researchers found excellent agreement between the SCORAD, the objective SCORAD, and the Three Item Severity score, confirming the applicability of these scores by nondermatologists.

The Scoring of Atopic Dermatitis (SCORAD) index is a composite index of extension, severity, and subjective symptoms of atopic dermatitis (AD) that was created in 1993 to obtain a consensus assessment method for this disease (1). Twenty years later, the SCORAD index remains one of the most widely used instruments for measuring AD severity in clinical practice and research (2). A simplified score, the Three Item Severity (TIS) score, was then created from SCORAD variables for easier and faster use (3). Although the SCORAD and TIS have been validated in several studies, few have evaluated the interobserver agreement between different disciplines (4).

We performed a cross-sectional study in 21 children with AD. Three dermatologists, two pediatricians, and a pediatric nurse evaluated each child using SCORAD. A dermatologist trained all pediatric researchers in the SCORAD using an ad hoc atlas of pictures of AD. The severity of AD according to the SCORAD was classified as mild (<25), moderate (25–50), or severe (>50). Two related scores, objective SCORAD and TIS score, were calculated as previously reported (5). The Ethics Committee of the Medical School at Pontificia Universidad Católica de Chile approved the study.

Interobserver agreement was evaluated for comparing scores and subitems using the intraclass

correlation coefficient (ICC). ICC agreement of 0.21 to 0.40 was considered fair, 0.41 to 0.60 moderate, 0.61 to 0.80 substantial, and 0.81 to 1.00 excellent. Comparison of score means between disciplines was made using the paired *t* test. Correlations between SCORAD and TIS scores were evaluated using Spearman rank correlation.

Twelve patients were female (57%) and nine were male (43%), with a mean age of 4.4 ± 4.3 years. The mean SCORAD score was 24.7 (range 5.5–46.8), the mean objective SCORAD score was 18.8 (5.5–45.1), and the mean TIS score was 2.9 (0.8–7.5). According to the SCORAD index, 11 patients had mild AD (52%), 7 patients moderate (33%), and 3 patients severe (14%).

The ICC between the six observers for SCORAD was 0.91 (95% confidence interval [CI] 0.84, 0.96). Interobserver evaluation showed moderate agreement for erythema, lichenification, and dryness and substantial agreement for edema and papulation, oozing and crusting, excoriation, and extension (Table 1). There was excellent agreement between dermatologists and pediatric researchers in the SCORAD (ICC = 0.95 [95% CI 0.88, 0.98]), objective SCORAD (ICC = 0.92 [95% CI 0.80, 0.97]) and TIS score (ICC = 0.85 [95% CI 0.67, 0.94]) (Fig. 1), although a significant tendency to provide higher scores was observed for pediatric researchers than for dermatologists for the SCORAD, objective SCORAD, and TIS (all $p < 0.01$). Interobserver agreement did not differ significantly according to the age or sex of patients ($p > 0.05$). Excellent correlations were found between the SCORAD and TIS for dermatology ($\rho = 0.71$, $p < 0.001$) and pediatric researchers ($\rho = 0.85$, $p < 0.001$).

This study demonstrates that SCORAD training leads to excellent agreement between dermatology and pediatric researchers. Oranje et al (4) reported good

TABLE 1. Interobserver Agreement Between Pediatric and Dermatology Researchers in 21 Children with Atopic Dermatitis

Item or score	Intraclass correlation coefficient	95% confidence interval
Erythema	0.56	0.37, 0.74
Edema or papulation	0.63	0.45, 0.79
Oozing or crusting	0.67	0.50, 0.82
Excoriation	0.68	0.52, 0.83
Lichenification	0.51	0.33, 0.71
Dryness	0.47	0.29, 0.68
Extension	0.77	0.63, 0.88
SCORAD	0.91	0.84, 0.96
Objective SCORAD	0.92	0.80, 0.97
TIS	0.85	0.67, 0.94

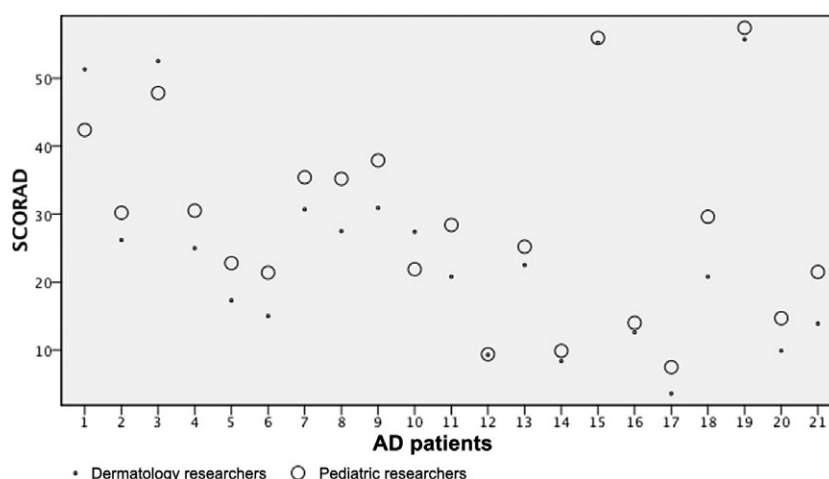


Figure 1. Bubble plot comparing average SCORAD of Atopic Dermatitis values between dermatology and pediatric researchers for each patient with atopic dermatitis.

agreement between experienced and inexperienced dermatologists evaluating an atlas of AD pictures. A strength of our study is that we evaluated real-life patients and obtained high concordance, although pediatric researchers had a slight tendency to overestimate AD severity, which must be considered when performing clinical trials. Our work supports training to standardize SCORAD scoring between researchers from different disciplines.

FUNDING

Funded by Fondo Nacional de Desarrollo Científico y Tecnológico grant number 1130615.

REFERENCES

1. Stalder JF, Taïeb A. Severity scoring of atopic dermatitis: the SCORAD index. Consensus Report of the European Task Force on Atopic Dermatitis. *Dermatology* 1993;186:23–31.
2. Schmitt J, Langan S, Williams HC. What are the best outcome measurements for atopic eczema? A systematic review. *J Allergy Clin Immunol* 2007;120:1389–1398.
3. Wolkerstorfer A, de Waard van der Spek FB, Glazenburg EJ et al. Scoring the severity of atopic dermatitis: three item severity score as a rough system for daily practice and as a pre-screening tool for studies. *Acta Derm Venereol* 1999;79:356–359.
4. Oranje AP, Stalder JF, Taïeb A et al. Scoring of atopic dermatitis by SCORAD using a training atlas by investigators from different disciplines. ETAC Study Group. Early treatment of the atopic child. *Pediatr Allergy Immunol* 1997;8:28–34.
5. Willemsen MG, van Valburg RW, Dirven-Meijer PC et al. Determining the severity of atopic dermatitis in children presenting in general practice: an easy and fast method. *Dermatol Res Pract* 2009;2009:357046.

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