

Research letter

Actinic Keratosis Area Severity Index (AKASI): reproducibility study and comparison with total lesion count

DOI: 10.1111/bjd.16559

DEAR EDITOR, Actinic keratosis (AK) is caused by ultraviolet radiation exposure and is more likely to be subclinical than visible. AK can potentially progress to invasive squamous cell carcinoma.¹ All stages of AK and sometimes, invasive squamous cell carcinoma² coexist in the 'cancerization field' where further neoplastic changes can occur.³ The current clinical or histological based classification systems are time consuming and are restricted by the presence of multiple lesions.^{4,5}

The Actinic Keratosis Area Severity Index (AKASI) evaluates sun-damaged skin in defined regions of the head, estimating a grade of severity according to erythema, distribution and lesion thickness, along with the area affected. The head is divided into four areas and each region is given a weighting based on its approximate relative size as follows: scalp 40%; forehead 20%; left cheek, ear, chin and nose 20%; right cheek, ear, chin and nose 20%. For each region, the initial step is to estimate the percentage of the area that is affected by actinic damage, represented by a numerical value between zero and six.

The three clinical signs of AK severity: distribution (none, isolated/scattered, clustered, clustered/confluent, all confluent), erythema (absent, slight, moderate, intense, very intense) and thickness (no palpability, just palpable, clearly palpable, thickened, very thickened) are assessed and scaled (zero to four).⁶

An AKASI subscore is calculated for each of the four areas of the head by adding the area and severity scores, and multiplying the subtotal by the area coefficient. The subtotals together give a total AKASI score for the entire head. Total scores range from zero (no AK/no actinic damage) to 18 (AK of the severest possible degree).⁶

In a pilot study of 30 consecutive patients, the reproducibility and accuracy of diagnosis with the AKASI compared with total lesion count (TLC), the current gold standard for AK severity reporting, was performed. Patients without previous skin cancer diagnosis and/or field and/or lesion treatments, on the area of evaluation were enrolled and examined by four dermatologists, masked to colleagues' diagnoses, following a consensus discussion of what lesions constitute AKs.⁷

Most patients were men ($n = 23$), with a mean age of 77 years (range 63–87). Mean \pm SD TLC results were $38.7 \pm$

20.7 (0–94). The intraclass correlation coefficient (ICC) for intraobserver TLC and for each parameter was almost perfect (> 80) but, when investigating the agreement between the observers according to TLC types, there was a lower correlation for AK type II compared with AK I and III. Type II lesions are discrete and are in part or totally covered by a scaly surface. Incorrectly classifying type II as type III could be of particular importance for clinical trials, as most studies exclude type III, suggesting that inclusion and exclusion criteria could be much more subjective than previously thought.

Mean AKASI results were 7.1 ± 2.5 (0–12.6). When considering the single AKASI score there was an almost perfect correlation for intraobserver and for each parameter (area score, thickness and distribution). AKASI thickness seemed easier to score than TLC, probably because of the different scoring methodologies. The presence of four different grades of thickness (none, just palpable, palpable, thick and very thick) could permit a better classification than a triple choice (nonpalpable, palpable, very palpable). Interestingly, the classification of erythema presented the greatest range of scores. By definition, erythema in the AKASI pertains to that within a sun-damaged field, and not because of telangiectasia, dermatitis or eczema, which can arise or coexist in the same area, potentially confounding the observer.

Interobserver variability analysis of TLC and the AKASI showed no significant differences between the four observers ($P > 0.05$). However, the ICC was slightly lower for TLC among the observers than for AKASI [0.92, 95% confidence

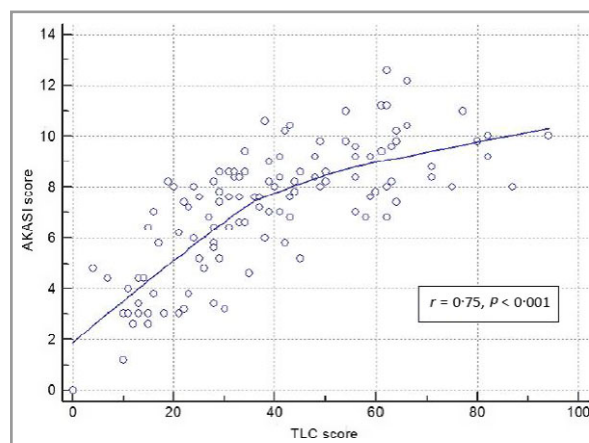


Fig 1. Correlation between the global Actinic Keratosis Area Severity Index (AKASI) scores and the global total lesion count (TLC) scores for all 30 patients by four independent masked observers.

interval (CI) 0.86–0.95 vs. 0.94, 95% CI 0.90–0.97, respectively]. Disease severity was classified similarly by either method of evaluation, as evidenced by the global AKASI and TLC scores correlation in a linear fashion ($r = 0.75$, 95% CI 0.66–0.82, $P < 0.001$; Fig. 1).

According to Bland Altman analysis, the level of agreement for both methodologies of classification by each observer was almost perfect, and as the differences within the mean and standard deviation were not clinically important, the two methods could be used interchangeably.

In this pilot study, the AKASI seems to be a potential alternative scoring system to TLC in both clinical and future clinical trial settings. Cut-off thresholds could help standardize patient comparisons and assist in tailoring and assessing individual treatments. Further validation in multicentre/multiobserver settings is required.

¹Department of Dermatology, University of Modena and Reggio Emilia, Italy

²Department of Dermatology, University Hospital Monklands, Airdrie, U.K.

³University of Glasgow, Glasgow, U.K.

⁴Dermatology Clinic, University of Catania, Catania, Italy

⁵Dermatology Department, Melanoma Unit, Hospital Clínic de Barcelona, IDIBAPS, Universitat de Barcelona, Barcelona, Spain

⁶Centro de Investigación Biomédica en Red en Enfermedades Raras (CIBERER), Valencia, Spain

⁷First Department of Dermatology – Venereology, National and Kapodistrian University of Athens Medical School, Andreas

G. PELLACANI¹

G. GUPTA^{2,3}

G. MICALI⁴ 

J. MALVEHY^{5,6}

A.J. STRATIGOS⁷

A. CASARI¹ 

J. CHESTER¹

S. KALECI¹

T. DIRSCHKA^{8,9}

Sygro Hospital, Athens, Greece

⁸Centroderm Clinic, Wuppertal, Germany

⁹Faculty of Health, University Witten-

Herdecke, Witten, Germany

Correspondence: Alice Casari.

E-mail: alice.casari@gmail.com

References

- Green AC. Epidemiology of actinic keratosis. *Curr Probl Dermatol* 2015; **46**:1–7.
- Deltondo JA, Helm KF. Actinic keratosis: precancer, squamous cell carcinoma, or marker of field cancerization? *G Ital Dermatol Venereol* 2009; **144**:441–4.
- Olsen EA, Abernethy ML, Kulp-Shorten C et al. A double-blind, vehicle-controlled study evaluating masoprocol cream in the treatment of actinic keratoses on the head and neck. *J Am Acad Dermatol* 1991; **24**:738–43.
- Weinstock MA, Bingham SF, Cole GW et al. Reliability of counting actinic keratoses before and after brief consensus discussion: the VA topical tretinoin chemoprevention (VATTC) trial. *Arch Dermatol* 2001; **137**:1055–8.
- Dirschka T, Gupta G, Micali G et al. Real-world approach to actinic keratosis management: practical treatment algorithm for office-based dermatology. *J Dermatolog Treat* 2017; **28**:431–42.
- Dirschka T, Pellacani G, Micali G et al. A proposed scoring system for assessing the severity of actinic keratosis on the head: actinic keratosis area and severity index. *J Eur Acad Dermatol Venereol* 2017; **31**:1295–302.
- Lee KC, Lew R, Weinstock MA. Improvement in precision of counting actinic keratoses. *Br J Dermatol* 2014; **170**:188–91.

Funding sources: none.

Conflicts of interest: none to declare.