DIGITAL ASSESSMENT OF HIDRADENITIS SUPPURATIVA DISEASE ACTIVITY

Wiala A [1], Schöllhammer M [2], Singh S [2], Rappersberger K [1,3], Schnidar H [2], Posch C* [4]

[1] The Rudolfstiftung Hospital, Department for Dermatology, Vienna – Austria;
[2] ScarletRed, Vienna - Austria School of Medicine
[3] School of Medicine, Sigmund Freud University, Vienna – Austria
[4] Technical University of Munich, Munich – Germany

BACKGROUND

Hidradenitis suppurativa (HS) is a chronic inflammatory skin disease affecting up to 2% of European adults. Disease activity is commonly assessed by counting of inflammatory nodules, abscesses and fistulas. Thus, it is time consuming and subject to inter-rater variability.

OBJECTIVE

To assess HS disease activity by means of automated, digital image analyses.

METHODS

Digital images of axillary and inguinogenital HS were collected in a clinical routine setting, using smartphones and a CE medical device certified skin imaging platform. Photos were automatically normalized for illumination and color. Image characteristics such as an erythema-score and image complexity were calculated for all photos comparing affected and unaffected skin.
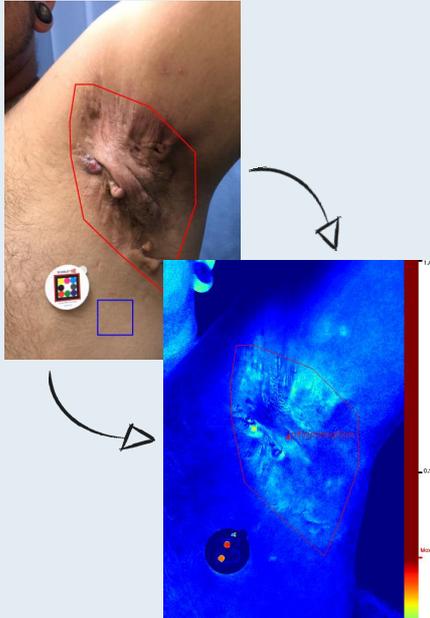
Parameters were used to calculate the HS Activity and Severity Score (HiSASS) and correlated with the average Physician Global Assessment (PGA) of each picture provided by 3 independent dermatologists. Follow-up images were used to evaluate disease activity over time.

RESULTS

226 photos of 150 HS-affected skin areas (52% axillary, 48% inguinogenital) and 33 non-affected controls were analyzed. HiSASS clustered disease activity into three categories similar to the Hurley grading system (Table 1).

Table 1

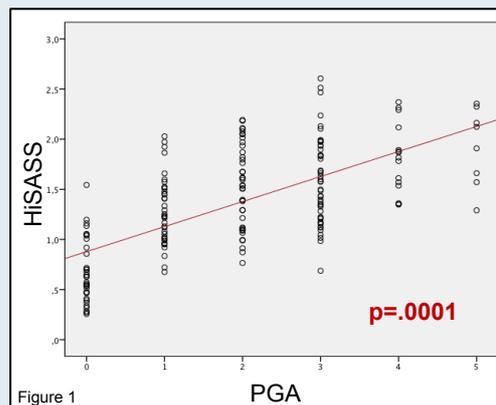|	Clear to minimal (0/1)	Mild to moderate (2/3)	Severe to very severe (4/5)
PGA class			
HiSASS	1,20	1,55	1,85

Figure 1.
Discovery dataset of n=226 HS images: Stripplot of calculated HiSASS values (y-axis) and PGA (x-axis): HiSASS significantly correlated with disease activity (p=.0001, r=.47; PGA – physician global assessment: 0 = no disease, 5 = very severe disease)

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| PGA: 4 | HiSASS: 2,51 | PGA: 1 | HiSASS: 0,99 |

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| PGA: 3 | HiSASS: 1,57 | PGA: 4 | HiSASS: 2,20 |

Additionally, the HiSASS allowed for a dynamic assessment of disease activity over time: Increasing HiSASS in the follow-up group (n=30; baseline: HiSASS^{ave} = 1. 6, follow-up:- HiSASS^{ave} = 1. 9) indicated disease worsening and correlated- significantly with increasing PGA scores (p=. 009).

n=30

CONCLUSION

Normalized mobile phone images could allow a fast, reliable, dynamic and reproducible disease severity assessment in HS patients.