Dermatomyositis assessment of rash via telemedicine: a preliminary study

Sirs,

Dermatomyositis (DM) is a rare systemic autoimmune disease with prominent skin manifestations that significantly impact quality of life (1, 2). The Cutaneous Dermatomyositis Disease Area and Severity Index (CDASI) is a validated clinician-scored instrument that measures skin disease activity (erythema, scale, ulceration) and damage (poikiloderma, calcinosis) (3). CDASI activity score (CDASI-a) >14 characterised moderate to severe disease, and a 4–5-point change reflected a minimal clinically significant change (4). However, CDASI requires clinical expertise and specialised training, especially for non-dermatologists or non-rheumatologists (5). We conducted a prospective proof-of-concept study to evaluate the feasibility of telemedicine-based CDASI-a compared with in-clinic evaluations.

DM patients fulfilling the 2017 EULAR/ACR criteria were enrolled. Each patient underwent 2 clinic visits ≥2 months apart, each followed by telemedicine visit within 1 month (Supplementary Fig. S1). At each encounter, two independent rheumatologists (MD1 and MD2) scored the CDASI-a. During telemedicine visits, physicians used secure real-time video calls combined with standardised smartphone images submitted by patients via a specialised mobile application. The mobile application guided patients to obtain standardised images of the face, upper chest, upper back, and dorsal hands regardless of the presence of rash. Images were securely uploaded to a HIPAA-compliant server. Patient-reported outcome measures (PROMs), including Skindex-16 (6), itch scale (7), and patient global activity (PtGA), were collected during clinic visits. Spearman's correlation coefficient (r_{sp}) evaluated correlations between modalities. Intraclass correlation coefficient (ICC) and Bland-Altman plot assessed inter-rater reliability.

Twenty-seven DM patients (median age 50, 81.5% female, 96.3% White, 48% anti-TIF1-γ positivity) participated. The median time between the clinic visits and corresponding telemedicine visits was 14.0 days (IQR 13.0–19.0). Median clinic CDASI-a for all visits was 4.5 (IQR 1.0–12.0), and the corresponding telemedicine CDASI-a was 5.0 (IQR 1.0–11.0), with no significant difference (p=0.78). Telemedicine CDASI-a strongly correlated with clinic CDASI-a (r_{sp}=0.93, p<0.001) and all PROMs, indicating good convergent validity and comparable to those between clinic CDASI-a and PROMs (Table I).

Inter-rater reliability for telemedicine CDASI-a between MD1 and MD2 was excellent (ICC=0.85, 95%CI 0.73–0.92, p<0.001). A Bland-Altman plot between MD1 and MD2's log10 transformation of telemedicine CDASI showed good agreement (Suppl. Fig. S2). CDASI-a changes over time, measured via telemedicine, are moderately correlated with clinic-based changes (r_{sp}=0.45, p=0.09). The percentage agreement between the Clinic CDASI-a and telemedicine CDASI-a was 90.3% using the 5-point improvement threshold.

All the participants successfully used the video platform and submitted standardised self-photographs, with caregiver assistance as needed.

Our findings support the feasibility of telemedicine for cutaneous DM assessment. The telemedicine CDASI-a showed good validity, reliability, and responsiveness to change when compared to traditional clinic CDASI-a. These results are consistent with prior studies of remote evaluation of Psoriasis Area and Severity Index (PASI) and Hand eczema severity index (HECSI) using digital images and teledermatology (8-10). Limitations include small sample size, racial homogeneity (predominantly White), and overall mild disease activity. Recall bias is possible, since the same rheumatologists conducted both clinic and telemedicine assessments, although a 14-day separation reduces this concern. The rashes could have changed during that period and might also influence the results. While dermatologists did not participate in evaluations, prior work has demonstrated strong reliability between dermatologists and rheumatologists while performing CDASI (5).

In conclusion, this preliminary study demonstrates that remote skin disease activity assessment in DM using telemedicine and patient self-images is feasible. Larger studies including more diverse populations and broader disease activity are needed to validate these findings and further explore the utility of teledermatology in clinical trials and routine care.

Table I. Validity of telemedicine CDASI-a[a].

Spearman rank correlation coefficients	Clinic CDASI activity (MD1)	Clinic CDASI Activity (MD2)	Skindex	Itch Scale	Patient global activity
Telemedicine CDASI-a (MD1)	**0.929** p<0.001 n=40	**0.866** p<0.001 n=40	**0.804** p<0.001 n=40	**0.563** p<0.001 n=40	**0.725** p<0.001 n=38
Clinic CDASI-a (MD1)	N/A	**0.923** p<0.001 n=40	**0.828** p<0.001 n=48	**0.480** p=0.001 n=48	**0.706** p<0.001 n=46
Telemedicine CDASI-a (MD2)	**0.875** p<0.001 n=42	**0.831** p<0.001 n=44	**0.717** p<0.001 n=44	**0.553** p<0.001 n=44	**0.691** p<0.001 n=42
Clinic CDASI-a (MD2)	**0.923** p<0.001 n=40	N/A	**0.809** p<0.001 n=50	**0.533** p<0.001 n=50	**0.753** p<0.001 n=48

CDASI-a: Cutaneous Dermatomyositis Disease Area and Severity Index activity score; MD1: first rheumatologist (primary treating rheumatologist).
[a]Higher CDASI-a, Skindex, Itch Scale, indicate higher disease severity.

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