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SAT0377 RELIABILITY OF A NEW AUTOMATED SYSTEM FOR ABSOLUTE CAPILLARY NUMBER COUNTING (AUTOCAPI) ON SYSTEMIC SCLEROSIS NAILFOLD VIDEOCAPILLAROSCOPIC IMAGES

M. Cutolo[1], K. Melsens[2], A.C. Trombetta[1], C. Pizzorni[1], E. Deschepper[3], A. Sulli[1], V. Smith[4]. *[1]Research Laboratory and Academic Division of Clinical Rheumatology, Department of Internal Medicine, University of Genoa, Genoa, Italy; [2]Department of Internal Medicine, Faculty of Medicine and Health Sciences; [3]Department of Public Health, Biostatistics Unit; [4]Department of Internal Medicine, Faculty of Medicine and Health Sciences; Department of Rheumatology, Ghent University Hospital, Ghent University, Ghent, Belgium*

Background: Nailfold capillary density is a useful measure in systemic sclerosis (SSc) classification and evaluation. Its manual detection may be time-consuming, hampering its use in largescale investigations. We evaluated a new automated system to assess the absolute nailfold capillary number.
Objectives: To attest the instrumental reliability of automatic counting in SSc patients using nailfold video capillaroscopy (NVC) images.
Methods: 75 NVC random images, from SSc patients, were blindly analyzed by four raters (2 less and 2 more experienced; raters: 1,2,3,4) from two European centers. Each rater was asked to define the region of interest (ROI) on the NVC images and to manually count the number of capillaries, according to the following instructions: upper bound placed on top of the longest capillary head and lower bound placed on half of the length of that longest capillary (figure 1); if the common branch of an abnormal shape (neoangiogenesis) is in ROI it is counted as being one; if the common branch is out of ROI it is counted as separate capillaries; if the capillary is on the edge of the vertical line of ROI, it is only counted when the head of the capillary is half in ROI; if the capillary head is on the edge of lower bound, it is counted as soon as the "head" part is in the ROI; all "heads" in the ROI are counted (not only distal row). The dedicated automated system (AUTOCAPI-ds medica, IT) also counted the number of capillaries in the same ROI (figure 1). Reliability between the manual and automatic counting was investigated per rater through intraclass correlation coefficient (ICC) and reported with 95% confidence interval (CI). External validation was obtained by multi-rating of the same set of images. Average difference between automated and manual counting per rater was calculated.
Results: The ICC (95% CI) of manual versus automatic counting in ROI was 0.77 (0.61–0.86) for rater 1 ($p<0.0001$), 0.81 (0.71–0.88) for rater 2 ($p<0.0001$), 0.65 (0.50–0.76) for rater 3 ($p<0.0001$) and 0.81 (0.71–0.87) for rater 4 ($p<0.0001$). The average difference was -0.69 for rater 1, 0.04 for rater 2, -0.03 for rater 3 and 0.16 for rater 4.

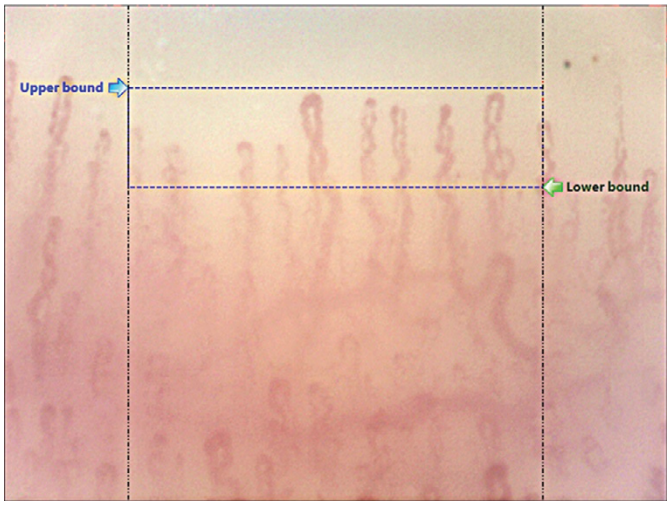

Figure 1. In the picture captured by the operator (normal subject), two vertical bars, with a distance of 1 mm appears automatically in the middle of the picture, together with two horizontal bars (upper bound and lower bound) to be placed manually (see text) in order to define the ROI.

Conclusions: This is a first study to attest the reliability of a new automated system to calculate the absolute number of capillaries in a ROI arising from SSc NVC images. High performance of the new automated counting system was confirmed in pathological conditions (SSc).
Disclosure of Interest: None declared
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SAT0378 BONE MARROW OEDEMA AND SYNOVITIS ON MRI OF THE HAND ARE ASSOCIATE WITH DIGITAL ULCERS, ACTIVE DISEASE AND IMPAIRED FUNCTIONAL CAPACITY IN SYSTEMIC SCLEROSIS

B. Stamenkovic[1,2], S. Stojanovic[1,2], J. Nedovic[2], V. Zivkovic[1,2], S. Milenkovic[2], J. Jovanovic[2], N. Damjanov[3], A. Stankovic[1,2]. *[1]Medical School; [2]Rheumatology, Institute Niska Banja, Nis; [3]Rheumatology, Institute for Rheumatology, Belgrade, Serbia*

Background: Hand inflammatory involvement is a major feature in patients with systemic sclerosis (SSc), responsible for major disability. Magnetic resonance imaging (MRI) can identify and characterize subclinical inflammation and joint damage on hand with much greater precision than clinical, radiographic and ultrasonography assessment in SSc.
Objectives: To determine the association of MR bone marrow oedema, synovitis and probability for the occurrence of listed inflammatory changes with clinical features and laboratory tests in SSc patients
Methods: 112 SSc patients were tested (mean age 54y). Contrast enhanced low field MRI of the wrist and MCP2–5 joints was performed to all the pts. MRI bone marrow oedema and synovitis were assessed and scored by OMERACT RAMRIS scoring system. Age, sex, SSc type, disease duration (date of first non Raynaud symptom), Raynaud phenomenon, articular or periarticular pain, joint swelling and contractures, digital ulceration, HAQ, acroosteolysis (by standard PA radiographs of hand and wrist) pulmonary arterial hypertension (PAP>40mmHg at rest on Doppler echocardiography), pulmonary fibrosis (by CT and pulmonary function tests) and laboratory tests (antibody profile, RF, CRP, Creatine phosphokinase) and disease activity (by Valentini index) were done.
Results: By multiple logistic regression analysis taking into account all clinical and laboratory variable, we found that MRI bone marrow oedema of the hand was associated and probability for the occurance of MRI bone marrow oedema was higher for the SSc pts with digital ulcers (OR=6.081;95%IP:1.295–28.550; $p<0.05$), HAQ>1.5 (OR=6.448; 95%IP: 1.714–24.257; $p<0.01$) and active disease (OR=3.377; 95%IP; 1.175–9.706; $p<0.05$).
MRI synovitis of the hand was associated and probability for the occurance of MRI synovitis was higher, also, for the SSc pts with digital ulcers (OR=5.128; 95%IP: 1.085–24.243; $p<0.05$), HAQ>1.5 (OR=9.067; 95%IP: 1.925–42.708; $p<0.01$) and active disease (OR=3.565; 95%IP: 1.181–10.764; $p<0.05$).
Conclusions: MRI bone marrow oedema and synovitis on the hand in SSc are associate with digital ulcers, impaired functional capacity and active disease. Monitoring and treatment of clinical features and organ involvement are essential in all the pts with SSc, especially those with proven bone marrow oedema and synovitis on MRI of the hand.
Disclosure of Interest: None declared
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SAT0379 NAILFOLD CAPILLAROSCOPY FINDINGS IN PATIENTS WITH INFLAMMATORY MYOPATHY AND/OR SPECIFIC OR ASSOCIATED ANTIBODIES

A.M. Millan Arciniegas[1], M.A. Martinez[2], A. Baucells[2], C. Juarez[2], L. Martinez[2], H.S. Park[1], B. Magallares[1], A. Laiz[1], P. Moya[1], J.M. Llobet[1], C. Diaz Torne[1], I. Castellvi[1]. *[1]Rheumatology; [2]Immunology, Hospital de Sant Pau, Barcelona, Spain*

Background: Nailfold videocapillaroscopy (NVC) is an easy, fast and non-aggressive tool, useful in the study of autoimmune diseases. The use of NVC in Inflammatory Myopathy (IM) is not clearly established.
Objectives: 1. To evaluate capillaroscopic findings in patients with IM and/or with presence of specific or associated antibodies with this pathology. 2. To analyze possible relationships with clinical characteristics of the patients.
Methods: Retrospective review of a cohort of patients with IM and/or with presence of specific or associated antibodies, followed in Rheumatology Unit of a University Hospital.
Patients underwent a NVC at 200x, being evaluated for the presence of: loss of capillary density, enlarged and giant capillaries, ramified capillaries, haemorrhages, thrombosis, tortuous capillaries, avascular areas, disorganization of capillary architecture and subpapilar venous plexus. The following variables were also collected: sex, age, active smoking, muscle weakness, CK elevation at diagnosis, compatible muscle EMG and biopsy, skin findings, cardiac disease, dysphagia, lung disease, Raynaud's phenomenon, cancer history and overlap syndromes.
For the comparison of qualitative and/or quantitative variables Fisher's exact Test or T-test was performed when necessary.
Results: Twenty patients with at least one NVC (45% with 2), 65% female, with a mean age of 58 years ± 11.6 were evaluated. The characteristics of the patients are detailed in table 1.
65% of patients had some capillaroscopic alteration. The findings in NVC-1 and NVC-2 were: loss of capillary density 30% and 33%, tortuous capillaries 90% and 89%, enlarged capillaries 65% and 66.7% (giants 30% and 33%), ramifications 40% and 55.6%, disorganization 10% and 33%, haemorrhages 25% and 44%, thrombosis 20% and 0%, avascular areas 25% and 22%, visible venous plexus 40% and 55%.
The presence of dysphagia was associated with the presence of loss of capillary

density ($p<0.02$) and haemorrhages ($p<0.01$) in the initial NVC, as well as the presence of ramifications in the control NVC ($p<0, 05$).
It was observed that patients with normal capillary organization presented better value of FVC ($p<0.01$), TLC ($p<0.01$), and lower FEV1/FVC ratio ($p<0.02$), the latter finding also found in control NVC ($p<0.03$). As additional data, we found that patients with anti-Ku+ presented better values of FVC ($p<0.04$) and TLC ($p<0.05$), but although they all had normal capillary organization, the association of this antibody with NVC was not statistically significant. We also did not find a statistically significant relationship between the alterations in NVC and the presence of Raynaud's phenomenon, the other clinical variables, cancer history and the presence of overlap syndromes.

Table 1	PATIENTS
N	20
Age at diagnosis (years)	55 ± 11,7
Time of evolution (years)	2,9 ± 1,8
Active smoking	5 (25%)
Muscle weakness	7 (35%)
CK elevation at diagnosis	8 (40%)
EMG compatible with IM	5/8 (62.5%)
Muscle biopsy compatible with IM	7/8 (87,5%)
Skin findings	6 (30%)
Cardiac disease	1 (5%)
Disphagia	5 (25%)
Lung disease	7 (35%)
Concomitant cancer	1 (5%)
Raynaud's phenomenon present	11 (55%)
Overlap:	5 (25%)
-With Systemic Sclerosis	4/5 (80%)
-With Sjögren Syndrome	1/5 (20%)
Anti-Mi2	4 (20%)
Anti-Ku	5 (25%)
Anti-Jo1	2 (10%)
Anti-PL7	2 (10%)
Anti-Ro52	5 (25%)
Other Ab (SRP, PL12, PM/SCL, OJ, MDA5, TIF1G)	6 (30%)

Conclusions: Patients with capillary disorganization in NVC showed worse values of FVC, TLC and FEV1/FVC. We found a statistically significant association between esophageal disease and haemorrhages, loss of capillary density and ramifications. Prospective studies with larger sample sizes are required to define the usefulness of NVC in the diagnosis, prognosis and follow-up of these patients.
Disclosure of Interest: None declared
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SAT0380 CLASSIFICATION, CATEGORISATION AND ESSENTIAL ITEMS FOR DIGITAL ULCER (DU) EVALUATION IN SYSTEMIC SCLEROSIS (SSC): A DESSCIPHER/EUSTAR SURVEY

J. Blagojevic[1,2,3], L. Cometi[1], G. Abignano[3,4], S. Guiducci[1], S. Bellando-Randone[1], D. Huscher[5], J. Avouac[6], L. Czirják[7], C. Denton[8], O. Distler[9], M. Frerix[10], V.K. Jaeger[11], V. Lóránd[7], B. Maurer[9], S. Nihtyanova[8], G. Riemekasten[12], E. Siegert[13], G. Valentini[14], S. Vettori[14], U. Walker[15], U. Müller-Ladner[10], Y. Allanore[16], F. Del Galdo[3,4], M. Matucci-Cerinic[1] on behalf of DeSScipher Consortium and contributing EUSTAR centres. *[1]Department of Experimental and Clinical Medicine, University of Florence, Florence, Italy; [2]Leeds Institute of Rheumatic and Musculoskeletal Medicine, University of Leeds; [3]NIHR Leeds Musculoskeletal Biomedical Research Unit, Leeds Teaching Hospitals NHS Trust; [4]Leeds Institute of Rheumatic and Musculoskeletal Medicine, University of Leeds, Leeds, United Kingdom; [5]Department of Rheumatology and Immunology, Charité University Hospital and German Rheumatism Research Centre, Berlin, Germany; [6]Department of Rheumatology, University of Paris Descartes, Paris, France; [7]Department of Rheumatology and Immunology, University of Pécs, Pécs, Hungary; [8]Department of Rheumatology, University College London, Royal Free Hospital, London, United Kingdom; [9]Department of Rheumatology, University Hospital Zurich, Zurich, Switzerland; [10]Department of Rheumatology and Clinical Immunology, Justus–Liebig University Giessen, Kerckhoff Clinic Bad Nauheim, Giessen/Bad Nauheim, Germany; [11]Department of Rheumatology, University of Basel, Basel, Switzerland; [12]University Schleswig-Holstein Lübeck, Lübeck; [13]Department of Rheumatology and Immunology, Charité University Hospital, Berlin, Germany; [14]Department of Rheumatology, Second University of Naples, Naples, Italy; [15]Department of Rheumatology, University of Basel, Basel, Switzerland; [16]Department of Rheumatology, University of Paris Descartes, Paris, France*

Background: A consensus on DU definition in SSc has been recently reached (1),while for their evaluation,classification and categorisation it is still missing.
Objectives: To identify in SSc a set of essential items for DU evaluation, to assess if the existing DU classification (2) was useful and feasible in clinical practice, and to investigate if the DU categorisation (3) was preferred to the simple division of DU in recurrent and not recurrent.
Methods: The DU Desscipher items that reached >60% of completion rate were administered to EUSTAR centres via online survey.These items were: DU distal to the proximal interphalangeal joints, recurrent DU, DU history, infection, gangrene, amputation, total number of DU, number of new DU, number of healed DU, number of DU defined as loss of tissue, number of DU due to calcinosis and number of DU due to digital pitting scars (DPS).Questions about feasibility and usefulness of the existing DU classification (DU due to DPS, to loss of tissue, derived from calcinosis and gangrene) (2) and newly proposed DU categorisation (episodic, recurrent and chronic) (3) were also administered.
Results: All Desscipher and 82/194 EUSTAR centres (42.3%) completed the questionnaire.Out of 27 items selected for the Desscipher study, those scored by>70% of participants as essential and feasible for DU evaluation in clinical practice were only the following: number of DU defined as a loss of tissue (level of agreement 91.1%), recurrent DU (84%) and number of new DU (74.4%).For 64.6% of the centres,the classification of DU was considered useful and feasible in clinical practice.Moreover, 80.3% of the centres preferred the categorization of DU in episodic,recurrent and chronic.
Conclusions: For clinical practice, EUSTAR centres identified only three essential items for DU evaluation and considered useful and feasible the proposed classification and categorisation of DU.The set of items needs to be further validated by Delphi voting in order to implement its use in clinical practice while further implementation of DU classification and categorisation is warranted.
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SAT0381 CORRELATION BETWEEN THREE DIFFERENT METHODS TO ASSESS DERMAL THICKNESS IN SYSTEMIC SCLEROSIS PATIENTS WITH DIFFERENT PATTERNS OF NAILFOLD MICROANGIOPATHY

B. Ruaro, A. Sulli, E. Alessandri, S. Paolino, M. Ghio, A.C. Trombetta, C. Pizzorni, V. Tomatis, M. Cutolo. *Research Laboratory and Academic Division of Clinical Rheumatology, Department of Internal Medicine, University of Genova, IRCCS AOU San Martino, Genoa, Italy*

Background: Systemic sclerosis (SSc) is characterized by the increase of dermal thickness (DT) (1). The modified Rodnan skin score (mRss) is the validated method to evaluate the severity of skin impairment (2,3). Several studies have reported the capability of high frequency skin ultrasound (US) to reflect the overall severity of the skin damage in SSc patients (4–5). The plicometer skin test (PST) is another method to evaluated cutaneous involvement in SSc patients (6).
Objectives: The aim of this study was to identify possible correlations between US, mRss and PST to evaluate DT in SSc patients with different patterns of nailfold microangiopathy.
Methods: Sixty-three SSc patients (mean age 64±11SD years, mean disease duration 7±6 years, 43 lcSSc and 20 dcSSc) and 63 sex and age matched healthy subjects were enrolled after written informed consent. All subjects were assessed by mRss, US and PST to evaluate the DT in the seventeen skin areas of the body usually evaluated by mRss (zygoma, fingers, hands, dorsum of hands, forearms, arms, chest, abdomen, thighs, legs, feet) (1–6). Nailfold videocapillaroscopy (NVC) was used to assess the proper pattern of microangiopathy and to calculate the microangiopathy evolution score (MES) (7–8). Statistical evaluation was performed by non-parametric tests.
Results: As expected, the group of SSc patients had a statistically significant higher DT, as evaluated by the three methods, at level of all areas when compared to the control group ($p=0.0001$). All methods demonstrated a progressively higher DT in patients with "Early", vs. "Active" and vs "Late" pattern of nailfold microangiopathy ($p<0.005$), and a positive correlation was observed with MES ($r=0.71$ $p<0.001$). A positive correlation was observed in SSc patients between the three method to evaluate DT (PST vs mRss $r=0.98$, $p<0.0001$; PST vs US $r=0.53$, $p<0.0001$; US vs mRss $r=0.53$, $p<0.0001$).
Conclusions: This study demonstrates a relationship between different methods to assess DT (US, mRss and PST) in SSc patients and a relationship between skin damage and microangiopathy impairment.
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