Methods: Forty-nine complete capillaroscopies, reported by expert capillaroscopists according to the different patterns manually (gold standard), were compared with the pattern detection capability of Capillary.io. A scoring system based on the algorithm of the Spanish Capillaroscopy Study Group (GREC) was performed and interpreted by capillary.io for the global interpretation of each of the capillaroscopies analyzed.

Results: Overall, 37 of the 49 capillaroscopies reported agreed with the diagnosed pattern (75.51%). Separately, the early pattern presented a concordance of 77.27% and the active pattern of 74.07%. In reference to the findings detected by the Capillary.io system, the mean overall density was 5.01 capillaries/mm in the group with the active pattern compared to 6.46 capillaries/mm in the early pattern. The density of dilations and megacapillaries was 2.81/mm and 1.21/mm in the active pattern group versus 4.69/mm and 0.4/mm in the early pattern group. Global diameters were greater in the active pattern group with an apical mean of 37.3 μ m compared to 28.5 μ m in the early pattern subgroup.

Conclusion: Capillary.io is a simple, easy-to-learn web system for interpreting capillaroscopic images of nail folds. It can be a very useful tool to standardize the interpretation of capillaroscopic images, not only individually for each capillary, but also jointly through the detection of different patterns.

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FLUORESCENCE OPTICAL IMAGING (FOI) DETECTS SUBCLINICAL INFLAMMATION IN HANDS OF PATIENTS DIAGNOSED WITH FIBROMYALGIA SYNDROME AND OTHER RHEUMATIC DISEASES

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Background: Myalgias are a common symptom of infections and diseases of the rheumatic type but can also occur in the case of physical overexertion or as an undesirable drug side effect. Anamnesis, clinical

examination and determination of specific laboratory parameters are usually helpful for diagnosis, but do not always lead to correct results. Particularly, differentiation between the diagnoses of fibromyalgia syndrome (FMS), polymyalgia rheumatica (PMR), and other myalgic diseases of the rheumatic type is often difficult. FOI are playing an increasingly role as quantifiable and sensitive diagnostic imaging methods. After injecting a fluorescent dye, the signal intensity enables visualization of the microcirculation. This can be used for the differential diagnosis of inflammatory, degenerative, muscular and connective tissue-associated diseases.

Objectives: The present work investigates the potential of this method for the detection of subclinical inflammatory processes to differentiate between FMS and various rheumatic diseases which are accompanied by myalgia.

Methods: Analyses of subjects without clinical symptoms (n = 59) were compared with patients with a clinical diagnosis of FMS (n = 63), PMR (n = 5), or polymyalgia as a consequence of other diseases (PM, n = 6), Sjogren's syndrome (SS, n = 20), and erosive rheumatoid arthritis (RA, n = 162). The FMS patients were stratified according to primary (n = 31) and secondary (n = 32) pathology. FOI signal intensity (SI) was defined by ratio of areas with SI in patients and controls. Clinical and FOI examinations were carried out under the conditions of standard outpatient rheumatological care. The laboratory parameters were created in certified medical laboratories.

Results: Only 21% of all patients diagnosed with FMS are seropositive for rheumatic factors. Secondary FMS have higher values than primary FMS (26 versus 13%). In contrast, 79% of the patients with RA, 75% of the SS patients, and 100% of the patients with PMR are seropositive. On average, both the CRP values and the ESR of FMS patients were in the normal range, whereas in the other cohort the mean values were significantly increased. X-ray examinations showed erosions in all patients with RA and in 80% with PMR, whereas this was only the case in less than 15% of FMS and SS patients. However, in nearly 80% of patients both with primary and secondary FMS, increased SI value as a sign of inflammation could be detected by FOI. While in patients with RA or PMR an accumulation of the dye in the metacarpophalangeal joints can be detected in an early phase of the FOI examination, in the FMS or SS patients signal increases can be detected in the later phases in the area of connective tissue, tendons and muscles (Figure 1).

Conclusion: The examination with FOI gives more precise information on the localization and extent of an inflammation in the hands and can thus make an important contribution to differential diagnosis and optimization of therapy. The present work demonstrates a high potential in the detection and localization of subclinical inflammatory processes which cannot be detected in FMS patients with other methods, often leading to a psychosomatic diagnosis. In future, there will be a requirement for diagnostic technologies that can be used widely and are suitable for interlinking therapy with diagnostics more closely than before.

Figure 1: Examples of FOI images in patients with clinical diagnosed: A. primary FMS or, B. secondary FMS as an accompanying syndrome of RA. Analysis of intermediate/late phase (P2/3) of fluorescence dye (indocyanine green) distribution.

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