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SAT0571

OPTICAL SPECTRAL TRANSMISSION TO ASSESS THERAPY RESPONSE IN PATIENTS WITH ARTHRITIS: A COMPARATIVE STUDY WITH CLINICAL, LABORATORY AND ULTRASONOGRAPHIC ACTIVITY MARKERS.

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Background: Valid assessment of disease activity leads to outcome improvement in patients with rheumatoid arthritis (RA) (1). Optical spectral transmission (OST) is a modern diagnostic tool able to assess the blood-specific absorption of light transmitted through a tissue, promising quantification of inflammation in the finger and wrist joints of RA patients (commercial device: HandScan - Hemics, The Netherlands) (2).

Objectives: To our knowledge, there are no data regarding the diagnostic value of OST in the evaluation of inflammatory activity changes during arthritis follow up. Thus, aims of this study were to examine the ability of OST to detect response to anti-inflammatory therapy in patients with arthritis and to explore OST associations with clinical, laboratory and ultrasonographic (US) activity markers.

Methods: OST measurements were performed in patients with active arthritides of the wrist and finger joints before and after administration of glucocorticoids (GC), during a disease flare. For the same points in time (a and b) patients and healthy controls underwent clinical, laboratory and joint US [Grey Scale (GSUS) - Power Doppler (PDUS)] examinations. OST-values before and after therapy were subsequently compared with their corresponding DAS28- and US-values. The distributions of Delta-PDUS and OST-values between the two time points were compared by Bayesian statistics. Moreover, OST diagnostic performance was tested by Receiver Operating Characteristics (ROC).

Results: We recruited 54 patients with active inflammatory arthritis: 39 RA, 4 gout, 7 peripheral spondylarthritides and 4 other miscellaneous arthritides (66.7% females) and 114 controls.

Previous to therapy with GC, median OST was [OST(a): 8.75 (5.38-16.25, IQR)] and after therapy [OST(b): 4.75 (2.38-8.63, IQR)] ($p < 0.05$). Similarly, DAS28 dropped significantly after GC therapy [DAS28(a): 5.12 (4.33-6.10, IQR) vs. DAS28(b): 3.85 (3.40-4.82), $p < 0.05$]. OST correlated moderately with PDUS at both time points: (a) $\rho = 0.449$ and (b) $\rho = 0.414$, respectively (both; $p < 0.01$). Moreover, OST correlated significantly with swollen joint count at both time points (a) $\rho = 0.379$ and (b) $\rho = 0.382$, $p < 0.01$ respectively.

OST and US performed similarly in the assessment of inflammatory changes caused by the administration of GC (same tendency in the change of OST values in 83.2% of the cases). Furthermore, Bayesian statistic revealed no significant differences between OST and US for all 3 examined joint categories (MCP: $p = 0.81$; PIP: $p = 0.74$; wrists: $p = 0.60$).

In addition, ROC revealed that OST is a very good tool to distinguish patients with arthritis from healthy controls at both examination points [AUC(a): 0.883(95% CI=0.83-0.94) and AUC(b): 0.811(95% CI=0.74-0.881)].

Conclusion: OST was able to assess response to therapy in arthritis patients comparable to US. Moreover, OST correlated with disease activity markers and could effectively differentiate between arthritis patients and controls. Therefore, OST could prove to be a valuable non-interventional time- and resource-saving diagnostic tool to assist arthritis monitoring.

References:

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Figure 1. OST-, PDUS- and DAS28- values before and after GC therapy.

Figure 2. OST- (group 1) and Ultrasound- (group 2) Bayesian distributions, means- and standard deviation-differences for MCP (A), PIP (B) and wrists (C).

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SAT0572

CONSTRUCTIVE VALIDITY OF MUSKULOSKELETAL ULTRASOUND MEASUREMENT OF CARTILAGE THICKNESS IN PATIENTS WITH KNEE OSTEOARTHRITIS

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Background: Cartilage thickness is one important measure in describing both OA development and progression. Based on current knowledge, conventional radiography (CR) and magnetic resonance imaging (MRI) have not been demonstrated to be superior over one another. Because of disadvantages of MRI and CR neither can be used in routine daily clinical practice for follow up of OA patients. Diagnostic ultrasound assessment (US) of cartilage thickness offers an alternative measure as a clinically available and more cost-effective source of knee articular cartilage imaging.

Objectives: Our objective was to determine the relationship between US and CR measures of femoral cartilage thickness in patients with knee osteoarthritis because systematic feature- and site-specific cross-comparison between these two methods is still missing in the current literature.

Methods: 120 patients with knee osteoarthritis (240 knees) are recruited for this study. The joint space width (JSW) and Kellgren and Lawrence (K&L) grade were measured using weight-bearing anteroposterior 30° knee semi-flexion knee radiography (with inclusion criteria K&L grade 1-4). Femoral cartilage thickness was measured three times in supine position and with a suprapatellar transverse scan with the knee in maximal flexion at the lateral condyle (LC), medial condyle (MC) and intercondylar notch (IN) by one rheumatologist and arithmetic mean is taken. Pain and