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POS1398

RHEUMATOLOGICAL PATIENTS PERFORMING BLOOD SELF-SAMPLING FOR DMARD THERAPY SAFETY: A PROOF OF CONCEPT STUDY COMPARING WITH VENOUS BLOOD SAMPLES

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Background: Regular blood sampling is a requirement for rheumatological patients receiving csDMARD, bDMARD or tsDMARD therapies (1). The frequent blood sampling affects the patient's life as they use a substantial amount of time at hospitals or by the general practitioner. Often visits are time-consuming with transport, waiting time, and for some patient's costly long travels. Giving patients the option of taking the blood samples themselves in their own home, as part of a patient-centred monitoring approach, could provide the patient much higher degree of independence. Further, it may increase the quality of life, cause higher compliance with taking the control samples and possibly reduce health care costs.

Objectives: 1. To investigate if rheumatological patients can take capillary blood samples and describe patient-reported outcomes (PRO) about the procedure. 2. Compare the venous and capillary samples' results. 3. Test if the laboratory automated analysis equipment can handle the small capillary samples.

Methods: 21 rheumatological patients, underwent capillary and venous blood sampling at up to 4 occasions (1-2 months between). Instructions were available on a pictogram. PRO data were assessed by questionnaires. The patient performed blood extraction to the capillary samples from a finger after using a device making a small incision (2mm depth and 3mm width). Two capillary tubes (one Microtainer K2-EDTA and one Microtainer lithium heparin with gel) were filled with a total volume of approximately 1.0mL blood. A phlebotomist took the venous sample. Blood samples were analyzed for alanine aminotransferase (ALAT), albumin, alkaline phosphatase (ALP), calcium, C-reactive protein (CRP), creatinine, potassium, lactate dehydrogenase (LDH), urate, hemolysis index, erythrocyte corpuscular volume (MCV), haemoglobin, leukocytes, differential count and platelets.

Results: A total of 53 paired capillary (C) and venous (V) samples were taken. The average perceived pain of the procedure of C sampling was VAS: 10.3 (SD:14.4) (0-100) versus V sampling VAS: 8.5 (SD:11.7). 90% of patients would accept it as a future form of blood sampling.

Differences in blood samples (C versus V) were: CRP (-3.4%); Hemoglobin (-1.4%); Creatinine (-4.4%), ALAT (-2.9%), neutrophils (1.43%), platelets (-16.9%). The index of hemolysis was on average 128.9mg/dL (SD: 203) in C versus 6.7mg/dL (SD: 4.6) in V. Results was evaluated by a rheumatologist, and 92.5% of capillary samples could be used to evaluate the safety of DMARD treatment based on the most critical samples for this: ALAT, creatinine, neutrophils and platelets (1). The 75 % not accepted were all due to aggregated platelets leading to low platelet count. There was hemolysis in 18% of the samples, but the analysis results could be used despite this.

Conclusion: In the majority of rheumatological patients, capillary self-sampling is well tolerated.

We show that it is possible to extract the needed results from the capillary samples to evaluate DMARD treatment safety, despite higher hemolysis index. Using capillary samples taken at home could be a central instrument in future rheumatological patient-centred monitoring.

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POS1399

ALGORITHM FOR DIFFERENTIAL DIAGNOSIS OF ARTHROPATHIES USING OSTEOSCINTIGRAPHY

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Background: Joint bone scintigraphy is a promising method for diagnosing of inflammatory joint diseases. However, its scintigraphic semiotics remains to be developed.

Objectives: To develop an algorithm for the differential diagnosis of the most common arthropathies based on quantitative osteoscintigraphy.

Methods: This single-center study included inpatients with clinical diagnoses of rheumatoid arthritis (RA), axial spondyloarthritis (including ankylosing spondylitis - aSPA), peripheral spondyloarthritis (including reactive arthritis - pSpA), psoriatic arthritis (PsA), and osteoarthritis (OA) established by a rheumatologist and meeting the relevant criteria. Three hours after the injection of pyrophosphate, labeled with Tc-99m, scintigraphy of the skeletal bones was carried out according to the "whole body" program. The joint / bone accumulation ratio (AR) was calculated as the ratios of counts in relevant areas. All AR were recalculated into T-score for each joint based on data from control group. The CHAID algorithm for classification trees constructing was used. The significance of the division in the nodes was estimated with Bonferroni adjustment.

Results: 266 patients were included in the study aged 46.6±14.3 years, men - 134 (50.4%). aSPA was diagnosed in 40 patients, pSpA in 87, RA in 45, OA in 68, PsA in 26. 2279 joints were analyzed. A classification tree for differential diagnosis of arthropathies has been built (Pict.). Key indicators for identifying subgroups in the algorithm: AR in the wrist, knee and hip joints.

At the first step of the classification tree, the sum of the T-scores of the wrist joints is determined. If this amount exceeds 7.76 (node 2), the most likely diagnosis is RA (58.5% of patients in the subgroup of this node). Patients with the sum of the T-scores in the wrist joints less than 7.76 (node 1), in turn, were divided depending on the sum of the T-scores of hip joints. Those with this value less than 3.25 (node 3), mainly suffered from OA (48.7%), less often in this subgroup were diagnosed pSpA (16.7%) and PsA (14.1%). Patients in whom the sum of the T-score in the hips was more than 3.245 (node 4) were further subdivided depending on the sum of the T-scores in the shoulder joints. If it was more than 4.21 (node 8), then pSpA was most likely (58.7%). If the sum of the T-scores of the shoulder joints was in the range from 2.05 to 4.21 (node 7), then these are mainly patients with spondyloarthritis (56.2% with aSPA and 31.2% with pSpA) and a small number of patients (10%) with PsA. In the subgroup with the sum of T-scores of the shoulder joints <2.05 (node 6), patients with PSA (40%) prevailed, with a significant proportion of persons with OA (27.5%). Thus, out of the final branches formed by the tree (node 2, 3, nodes 6-8), four correspond to certain diseases (node 2 - PA, node 3 - OA, node 7 - aSPA, node 8 - pSpA). Node 6 includes patients with various diseases with a predominance of PsA. The level of significance of differences between the formed groups at all branch points of the tree is p = 0.001 or less (Bonferroni adjusted). In the training sample, 51.5% of observations are correctly classified. According to cross-validation data, the expected rate of correct classifications in real application of the algorithm is 38.0%.

Conclusion: An algorithm for the differential diagnosis of the most common inflammatory diseases of the joints has been developed, which makes it possible to use the data of quantitative osteoscintigraphy in the process of diagnosing arthritis.