Abstract 1

BACKGROUND: Refractory rheumatoid arthritis (RRA) is a subtype of rheumatoid arthritis (RA), in which the sequential administration of optimal methotrexate (MT) doses in combination with glucocorticoids (GCs), and at least - two biologic disease-modifying antirheumatic drugs (bDMARDs) with different mechanisms of action during 18-24 months does not lead to a significant decrease in the inflammatory activity of RA.

OBJECTIVES: Analysis of the selection strategy and the "survival" of bDMARDs in patients with RRA.

METHODS: The retrospective study included data of 95 RRA patients (80 females, 80.8%), aged 23 to 80 years (mean age 57 years), treated with bDMARDs. Mean RA duration was 11.9±7.6 years. All patients were divided into 6 groups depending on the number of the lines of therapy (LOTs) received (from 2 to 7 consecutive bDMARDs). Totally 348 cases of bDMARDs administration were analyzed.

RESULTS: TNF-α inhibitors were most commonly used as the first and second lines of therapy: infliximab (INF) – 43 prescriptions, adalimumab (ADA) – 39, etanercept (ETC) – 23, certolizumab pegol (CZP) – 11, golimumab (GLM) - 6. Abatacept (ABA) was prescribed in 32 cases, rituximab (RTM) in 22 cases, and tocilizumab (TCZ) - in 12 cases. The following reasons for bDMARDs discontinuation were identified: lack of efficacy (LE) (55.2% of cases), adverse events (AE), including serious adverse events (14.8% of cases), administrative reasons (10.0% of cases), persistent remission (2.1% of cases), pregnancy (0.6%), and other (17.3% of cases).

CONCLUSION: The mean retention on a drug in the 3rd and 4th lines of therapy in patients with refractory rheumatoid arthritis was significantly longer than on the 1st line of therapy. The most common reason for bDMARDs discontinuation was the lack of efficacy (LE) (55.2% of cases), AE (13.8%), including serious AE (3.1%), adverse events (17.5%), and other (14.1%).

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Abstract 2

Fluorescence optical imaging (FOI) aids differential diagnosis of rheumatic diseases and increases treatment response rate in RA through patient stratification.

M. Ferl1, S. Ohndorf2, J. Berger7, A. Briel2, P. Welker1. 1Medical Faculty University Hospital Magdeburg, Berlin, Germany; 2Charité - University Medicine Berlin, Berlin, Germany; 3Xiralite GmbH, Berlin, Germany

Background: In recent years, indocyanine green (ICG)-enhanced FOI has become clinically available as a novel tool for the early detection of rheumatic diseases, assessment of disease activity and monitoring of treatment response. The high sensitivity of this method allows visualization of slight changes in the microcirculation of the hands as a sign of inflammation. Different rheumatic diseases present characteristic signal enhancement patterns, which may facilitate differential diagnosis. Signal enhancement in metacarpophalangeal (MCP) joints, for example, can frequently be seen in patients with rheumatoid arthritis (RA).

Objectives: We analyzed data of a multicentric clinical study (OPERA, n = 3300) including patients with different rheumatic diseases. Patients were divided into groups using clinical parameters followed by FOI examination to test the hypothesis that this method can improve the diagnosis.

Methods: The present study involved 200 patients with RA (n=200), divided into groups according to Steinbrocker's (STBR) staging system, patients that had degenerative osteoarthritis (OA, n=100), and a control group without clinical symptoms (n=40). RA patients were examined before and during treatment with biologicals, glucocorticoids (GC), or DMARDs. Clinical and laboratory assessments were made by analyses of DAS28, patient questionnaires, rheumatoid factor (RF), anti-citrullinated protein antibodies (ACPA), erythrocyte sedimentation rate (ESR), and x-rays. FOI signal intensity (SI) was defined by ratio of areas with SI in patients and controls. Images were analyzed visually, and MCP joints were judged as positive if in the early phase of ICG inflow, a higher SI in any MCP region was found in comparison to the control group.

Results: Initially, serum factors typical for RA patients were analyzed in the different groups. In 23 % of OA patients RF and/or ACPA were detected in the serum. Surprisingly, in the STBR I group, only 35 % of patients were tested as serum-positive for RF and/or ACPA. After FOI, the patients were subdivided into two groups with and without ICG enrichment in MCPs. In the MCP-positive group, the proportion of RF/ACPA-positive patients was increased to 83%, with only 25 % seropositive patients in the MCP-negative group. In STBRI-II cohorts, the proportion of RF/ACPA-positive patients was significantly higher as in the STBR group, but also increased after FOI analysis of MCP positivity. The group treated with biologicals (STBRI-IV), responders were identified both by clinical parameters and FOI. After treatment, 42 % of all analyzed patients were found to respond to treatment. Compared to all patients, the MCP-positive group showed a significantly increased response rate at 71%, while all patients (100%) in the MCP-negative group were identified as non-responders (Figure 1).

Conclusion: This study shows that FOI is highly effective for the diagnosis of RA, selection of the appropriate therapy, and for the monitoring of therapeutic success. Treatment response rate can be increased (from 42% to 71%) through patient stratification in terms of ICG enrichment in MCP.

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Figure 1: Examples of FOI images in patients with suspected early rheumatoid arthritis before and after treatment with anti-rheumatic biomarkers.