common to both vaccines were analyzed using a multiplex bead array assay (Luminex). Positive antibody response was defined as at least 2-fold increase in prevaccination serotype-specific antibody concentration. Number of serotypes with positive antibody response after prime-booster vaccination were compared between treatment groups and controls using Mann-Whitney U test. In addition, the difference in number of serotypes with positive antibody response between prime and prime-booster vaccination in each treatment group was compared using Wilcoxon signed-ranks test.

Abstract THU0149 – Figure 1

Results: Compared to PCV alone, the combined schedule with PCV+PPV23 resulted in increased antibody response for patients treated with abatacept, MTX/AZA/MMF, and controls (all $p \leq 0.01$). In patients with rituximab and previous PCV7 or PCV13, booster vaccination with PPV23 did not result in increased antibody levels (Figure: bars marked grey). The numbers of serotypes with a positive antibody response to the combined vaccination with PCV + PPV23 was reduced in patients with rituximab (median 1, $p \leq 0.001$), abatacept (median 7, $p \leq 0.001$) and MTX/AZA/MMF (median 9, $p \leq 0.001$), but not in patients without DMARDs (median 10, $p=0.12$), compared to controls (median 11).

Conclusion: Prime-booster vaccination strategy using a combination of a dose of pneumococcal conjugate vaccine followed by a dose of polysaccharide vaccine improved antibody responses in patients with inflammatory rheumatic disease treated with abatacept and traditional DMARDs compared to PCV alone. The combined vaccination resulted in a markedly lower response in rituximab treated patients, and was to a lesser degree reduced in patients with abatacept or traditional DMARDs compared to healthy controls.

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THU0150 FINGER JOINT CARTILAGE EVALUATED BY ULTRASOUND IN PATIENTS WITH RHEUMATOID ARTHRITIS AND HEALTHY SUBJECTS

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Background: Joint destruction in rheumatoid arthritis (RA) includes both bone and cartilage lesions. Since joint space narrowing (JSN) is not a direct evaluation of cartilage using X-ray, we aimed to examine the validity of ultrasound (US) cartilage evaluation in patients with RA.

Objectives:

Methods: The cartilage thickness of bilateral metacarpophalangeal (MCP) and proximal interphalangeal (PIP) joints of the 2nd to 5th fingers were

visualized from a dorsal view with joints in approximately 90 degrees flexion and measured at the middle portion. Furthermore, one US examiner performed the semiquantitative scoring of the recorded cartilage images in a blinded manner on a scale of 0–2. In addition, the JSN of the corresponding joints was scored using the van der Heijde-modified Sharp method with a hand X-ray. Continuous variables were analysed using the Mann–Whitney U test. The relationships among the total measurement of cartilage thickness, its semi-quantitative score, and the JSN score were assessed using Spearman's rank correlation coefficients.

Results: One hundred and three patients with RA and 42 healthy subjects were enrolled in this study. The total cartilage thickness was significantly thinner in patients with RA compared to healthy subjects for both the MCP and PIP joints (both $p < 0.001$). The semi-quantitative sum of 16 joints ranged from 2 to 26 (median 8) in patients with RA, which was significantly greater than the 0 to 11 (median 4) seen in healthy subjects ($p < 0.001$). In patients with RA, the semi-quantitative score showed a significant negative correlation with cartilage thickness ($\rho = -0.64$; $p < 0.001$) as well as a significant positive correlation with JSN score ($\rho = 0.66$; $p < 0.001$). In addition, in healthy subjects, semi-quantitative score, but not cartilage thickness was significantly correlated with age ($\rho = 0.49$; $p = 0.001$ and $\rho = -0.25$; $p = 0.118$, respectively). On the other hand, in RA, these scores showed a significant correlation with RA disease duration but not correlated with age.

Conclusion: A simplified and direct evaluation of finger joint cartilage damage by semi-quantitative US score is valid and useful for patients with RA.

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THU0151 COMPARISON BETWEEN THREE PROPOSED DEFINITIONS OF DIFFICULT-TO-TREAT/REFRACTORY RHEUMATOID ARTHRITIS IN A COHORT OF bDMARD-TREATED PATIENTS

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Background: A definition of difficult-to-treat/refractory rheumatoid arthritis (RA) (RRA) has not been established yet, nevertheless, RRA is commonly associated with the resistance to multiple bDMARDs [1,2,3].

Objectives: The objective was to evaluate the rate of RRA according to three definitions, the agreement between the definitions and major determinants of such definitions in a large monocentric cohort of RA patients.

Methods: We included RA patients treated with any bDMARD (≥ 1 year), who started bDMARDs after 2001. Considered definitions of RRA were: B-RAA, according to Buch [3], failure of ≥ 1 anti-cytokine (TNF and/or IL6 inhibitor) and ≥ 1 cell-targeted (B-cell and/or T-cell inhibitor) bDMARD; KF-RAA, according to Kearsley-Fleet [2], exposed to ≥ 3 bDMARDs classes; DH-RAA, according to de Hair [1], signs and/or symptoms suggestive of inflammatory RA activity (in the study we assumed DAS28 ≥ 3.2 or extra-articular manifestations) and failure of ≥ 1 csDMARD and ≥ 2 bDMARDs. Agreement was measured with Cohen's kappa. To assess variables independently associated with RRA, multivariate regression analysis was used including variables achieving $p < 0.10$ in univariate analysis.

Results: Patients included in the study were 572. B-RAA was observed in 165 (28.8%), KF-RAA in 96 (16.8%) and DH-RAA in 57 (10.0%). DH-RAA was the most stringent definition. Agreement between the definition was fair: DH-RAA and B-RAA kappa=0.330, $p < 0.001$; DH-RAA and KF-RAA kappa=0.260, $p < 0.001$; B-RAA and KF-RAA kappa=0.275, $p < 0.001$. Most common last bDMARD choice in RRA patients differed according to the definition: B-RAA mostly adalimumab (30.9%) ($p < 0.001$), KF-RAA tocilizumab (78.1%) ($p < 0.001$), DH-RAA tocilizumab (33.3%) or abatacept (31.6%) ($p < 0.001$) (Figure). Multivariate analysis revealed that, as expected, all definitions were affected by the number of bDMARDs, and DH-RAA also by the disease activity. Mean PDN daily dose was associated with B-RAA; lower BMI with KF-RAA; the start of bDMARD treatment in earlier years with KF-RAA and DH-RAA; and radiographic progression (in the 24 months before the study) with DH-RAA (Table).