15. A roadmap to personalized medicine in Rheumatoid Arthritis using anti-Sa antibody titers to monitor the immunopathologically driven, clinical disease activity.

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Previously, in a Canadian early RA cohort, serum anti-Sa (citrullinated vimentin) antibodies have been shown statistically to be specific biomarkers for diagnostic and better tools than RF and anti-CCP combined to predict severe erosive evolutions. Here, we ask if anti-Sa levels can be used to monitor RA in real world, N-of-1 observations.

Methods: Anti-Sa positive patients with early RA were followed for 2 years as part of a hospital-based, academic practice (HAM). Patients received aggressive standard-of-care treatment, aiming at remission. Joint counts and anti-Sa levels (Euroimmune anti-Sa ELISA) were obtained at baseline and at regular intervals. Patients were stratified into low, medium, and high titre anti-Sa at baseline. We calculated mean joint counts (tender/swollen) and mean anti-Sa levels within each subgroup and looked at their non-parametric correlation in each patient.

Results: Twenty-three (23) patients with early RA tested positive for anti-Sa (cut off 0.2 Arbitrary Units [AU]). In the low-range subgroup (0.2-0.75 AU, mean 0.4 AU), anti-Sa levels had declined by 75.0% to 0.10 AU within the first year of treatment, and by 80.0% to 0.08 AU at the end of second year. In the same period, the mean joint count declined 60.0% (20.3 to 7.91) and 90.0% (20.3 to 1.82), respectively. In the medium-range subgroup (0.75-1.5 AU, mean 0.92 AU), the anti-Sa levels had declined by 56.5% to 0.40 AU within the first year and by 71.5% to 0.26 AU at the end of the second year. Mean tender/swollen joint count declined 86.8% (19 to 2.5) and 85.3% (19 to 2.8), by the first and second years, respectively. In the high-range subgroup (1.5-2.5 AU, mean 1.81 AU), the anti-Sa levels had declined by 59.9% to 0.73 AU within the first year and 79.9% to 0.40 AU by the end of the second year. Mean tender/swollen joint count declined 93.8% (16.2 to 1) and a further 100% (16.2 to 0), in the first and second years, respectively. In the majority of patients, variations of anti-Sa titres and joint counts were concordant. In the patients where anti-Sa became negative, the joint score was zero. Variations in anti-CCP and RF titres were discordant with joint counts.

Conclusion: In contrast to anti-CCP and RF titres, anti-Sa titres can be used in N-of-1 settings to monitor the most RA-specific immune mechanism. As it may represent true (serological and clinical) remission, could normalization of anti-Sa titres be a firm therapeutic goal to pursue? Further longitudinal studies in personalized medicine are needed to explore that proposition.