Comparison of Body Mass Index, Anti-Citrullinated Peptides Antibodies Status and Periodontal Condition in First Degree Relatives Individuals to Rheumatoid Arthritis

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First publication: September 28, 2016

SESSION INFORMATION

Session Date: Sunday, November 13, 2016
Session Title: Rheumatoid Arthritis – Clinical Aspects - Poster I: Clinical Characteristics/Presentation/Prognosis
Session Type: ACR Poster Session A
Session Time: 9:00AM-11:00AM

Background/Purpose: Association studies in rheumatoid arthritis (RA) have been focused in the pre-clinical phases of the disease in asymptomatic individuals with higher risk to develop RA such as first-degree relatives (FDR). Previous data has shown that obesity, the anti-citrullinated peptides antibodies (ACPA) status and the periodontal condition may modulate the severity and the clinical presentation of RA. The objective of this study were to investigate the body mass index (BMI), ACPA status, the frequency and severity of periodontal disease and the level of antibodies IgG-1, IGG-2 against *P. gingivalis* in healthy FDR individuals of RA-patients and compare these variables with a control group of healthy individuals from general population.

Methods: In total, 100 FDR individuals and 200 healthy controls paired by age and gender were included. Rheumatologic and periodontal assessment was performed as well as anti-*P gingivalis*antibodies and ACPA. The group-comparisons were analyzed using McNemar and Wilcoxon tests. A conditional logistic regression analyses was performed to establish associations between BMI, ACPA status and periodontitis in FDR individuals and control group.

Results: In the FDR-group, seventy percent were female with a mean age of 37.3±13 years. In the FDR-group 17% had obesity (BMI>30), compared to 7.5% in the control group. Additionally, there was association related to the presence of obesity in the FDR group (OR: 2.9, 95% CI 1.03-8.28). ACPA presence was found in 7% in FDR vs 2.5 % in control group (p=0.038), and was associated in the FDR group (OR: 2.4, 95% CI 0.7- 8.32). In the FDR-group 79% had periodontitis in comparison with control group 56% (p=0.001). Fifty percent of severe periodontitis was observed in FDR vs 9% in control group (p=0.009). A significant association was found in FDR individuals regarding the presence of periodontitis (OR: 3.95% CI 1.89–7.29). Results presented in Table 1. Regarding the presence of antibodies anti *P. gingivalis*(IgG1-IgG2) and smoking history, no differences between groups were found.

Conclusion: Obesity, ACPA expression and periodontitis (diagnosis and severity) can be considered as relevant risk factors associated to the development of RA in individuals FDR. The impact of interdisciplinary management, weight-loss interventions, recommendations on physical activity and screening of periodontal status in asymptomatic individuals at high-risk of developing RA such as FDR, should be further investigated. **Table 1.** Conditional logistic regression model for indicators related to the status of first-degree relatives of patients with RA (Obesity, ACPA, Periodontitis Diagnosis and adjusted Age)

	Unadjusted model		Adjusted model	
	OR	CI 95%	OR	CI 95%
Obesity (BMI≥30)	2.93	1.03 – 8.28	2.37	0.28 - 19.84
ACPA IgG-IgA (≥20 U)	2.45	0.72 – 8.32	11.82	0.07 - 1819.30
Periodontitis	3.70	1.88 – 7.29	7.63	1.07 - 54.30
Age	0.53	0.34 – 0.83	0.53	0.34 – 0.84

Periodontitis based on definition of CDC/AAP. Age = continuous Unadjusted model = includes ACPAs IgG/IgA, periodontitis, obesity and age Adjusted Model = includes ACPAs IgG-IgA, periodontitis, obesity, age and interaction of ACPAs IgG-IgA and Periodontitis with age and obesity

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Disclosure: S. Unriza-Puin, None; **W. Bautista-Molano**, None; **G. Lafaurie**, None; **R. R. Valle-Oñate**, None; **P. Chalem**, None; **L. Chila**, None; **J. M. Bello**, None; **C. Romero Sanchez**, None.

View Abstract and Citation Information Online - http://acrabstracts.org/abstract/comparison-of-body-mass-index-anti-citrullinated-peptides-antibodies-status-and-periodontal-condition-in-first-degree-relatives-individuals-to-rheumatoid-arthritis

Abstract Number: 508

Before Clinically Detectable Arthritis Develops, ACPA-Positive and ACPA-Negative Arthralgia Patients Have Different Symptoms

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First publication: September 28, 2016

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Background/Purpose: Anti-citrullinated protein antibody (ACPA)-positive and ACPA-negative rheumatoid arthritis (RA) have different genetic risk factors and underlying biological mechanisms. Therefore, we hypothesized that patients' characteristics in the symptomatic phase before clinical arthritis has emerged are also different. We investigated this by studying the arthralgia phase of ACPA-positive and ACPA-negative patients.

Methods: Patients included in a clinically suspect arthralgia (CSA)-cohort were followed for 2 years or until arthritis development. At inclusion, information on initial symptoms and current symptoms was obtained, physical examination and MRI performed and blood samples taken.

Results were compared between ACPA-positive and ACPA-negative CSA-patients that later developed arthritis. Results: 60 patients (25-ACPA-positive, 35 ACPA-negative) included between April 2012 and March 2016 developed arthritis. 80% of ACPA-negative patients experienced morning stiffness as an initial symptom, compared to 52% of ACPA-positive patients (p=0.022). ACPA-positive patients more often had symptoms in both upper and lower extremities than ACPA-negative patients (40% versus 6%, p=0.001). ACPA-positive patients had a longer symptom duration at first presentation (median of 21.3 weeks versus 10.4 weeks, p=0.016) but converted to arthritis quicker (median 5.7 weeks versus 17.9 weeks after inclusion, p=0.015). A combination of variables clustered ACPA-positive and ACPA-negative patients in PLS-analysis.

Conclusion: In the phase preceding clinical arthritis, ACPA-negative and ACPA-positive arthralgia patients have