Abstract

Objective: There is an increased risk of developing rheumatoid arthritis (RA) during the postpartum period, but the etiology of this risk is unknown. The goal of this study was to determine whether pregnancy is associated with an increased prevalence of anti-cyclic citrullinated peptide (CCP) antibodies, which are RA-related antibodies that have been identified in the blood prior to the onset of joint disease in RA.
Methods: Stored serum samples were obtained from 340 RA-free women in their 3rd trimester of pregnancy and 142 non-pregnant controls. Samples were tested for anti-CCP3 (IgG Inova) and anti-CCP3.1 (IgG/IgA Inova). Questionnaires were used to assess women's health and smoking histories. Chi-square/Fisher's exact testing were used to compare groups. In addition, cervicovaginal fluid (CVF) and breast milk (BM) samples were obtained from 28 postpartum women and CVF in 52 non-postpartum controls. All samples were tested for anti-CCP-IgG (Inova) and anti-CCP IgA (in house assay). Questionnaires were used to assess women's health and smoking histories. Pearson's correlation and Mann-Whitney-U testing were used to compare groups.
Results: The prevalence of serum anti-CCP positivity did not differ between pregnant and non-pregnant women. [For CCP3, 2.1% vs. 1.2%, p=0.43 and for CCP3.1, 1.4% vs. 1.5%, p=1.0]. Within the pregnant women, there was no difference in anti-CCP positivity based on age, history of ever-smoking, or sexually transmitted infection during pregnancy. In postpartum women, total number of pregnancies significantly correlated with CVF anti-CCP-IgG and CVF anti-CCP-IgA levels [For CVF anti-CCP-IgG, r=0.33, p=0.01; for CVF anti-CCP-IgA, r=0.40, p=0.01]. In addition, age was significantly correlated with BM anti-CCP-IgA levels [r=0.43, p=0.05].
Conclusion: An association between pregnancy and systemic anti-CCP antibodies was not identified, suggesting that the increased risk of developing RA in the postpartum period is not due to increased systemic anti-CCP development during pregnancy. However, we did find a positive correlation between total number of pregnancies and local anti-CCP antibodies in the female genital tract and between age and anti-CCP antibodies in BM during the postpartum period. Additional studies are needed to understand how this mucosal generation of anti-CCP antibodies during the postpartum period influences the risk of RA development and the influence of genetics and other environmental factors on the development of anti-CCP during pregnancy and postpartum.