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ePoster Viewing
Diagnostic virology (other than hepatitis & HIV)

Comparison of CMV-ELISPOT and CMV-QuantiFERON assays for the evaluation of CMV-specific T-cell response in pregnant women

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Background: Human cytomegalovirus infection represents one of the main causes of congenital deafness and neurological impairment in newborns. CMV mother-to-fetus transmission may result either from primary infection in non-immune pregnant women or from non-primary infection in seropositive women. Evaluation of the virus-specific humoral immunity allows distinguishing between the two types of infection, which are associated with different risks of congenital transmission. We have recently demonstrated that a high CMV-specific T-cell immunity also correlates with an increased risk of vertical CMV transmission in primarily infected pregnant women. The aim of our study was to compare two different interferon-gamma release assays (IGRAs), CMV-ELISPOT and CMV-QuantiFERON®, in order to assess their correlation and predictivity with respect to fetal CMV infection.

Material/methods: This study was conducted on 195 women: 57 pregnant women with primary CMV infection, 23 pregnant women with non-primary CMV infection and, as controls, 89 healthy CMV seropositive and 15 CMV seronegative pregnant women, 11 seropositive or seronegative non-pregnant women. For each study participant we evaluated the virus-specific cell-mediated immunity by CMV-ELISPOT and CMV QuantiFERON® [CMV-QFT]. Pregnant women with active CMV infection were also tested for the CMV-specific humoral immunity (CMV IgG and IgM, CMV IgG avidity) and for CMV viremia and viruria by Real Time PCR and congenital CMV infection was diagnosed by CMV DNA detection in amniotic fluid or in newborn's urine. Data were statistically analyzed using ANOVA test, negative binomial regression and Pearson's pairwise correlation analysis. A p-value < 0.5 was considered statistically significant.

Results: ANOVA analysis showed statistically significant differences in the specific T-cell immunity between the study groups both for CMV-ELISPOT and CMV-QFT. When the analysis was restricted to pregnant women with active CMV infection (primary and non-primary) and healthy CMV seropositive pregnant women (controls) only CMV-ELISPOT results showed significant differences in the CMV-specific T-cell response between the primary infection and control groups (p=0.005) and primary and non-primary infection groups (p=0.002). Under the same restriction, no significant differences were observed within the CMV-QFT results. A significant correlation between the two IGRA assays was demonstrated by negative binomial regression analysis (p=0.02). Pearson's pairwise correlation analysis carried out in pregnant women with active CMV infection confirmed this association. However, together with other serological and virological markers, CMV-ELISPOT but not CMV-QFT

was significantly correlated with an increased risk of vertical CMV infection ($p<0.001$) and within this study group primarily infected pregnant women displaying higher levels of CMV-specific T-cells were the ones in whom vertical transmission occurred.

Conclusions: Our data demonstrate the correlation between CMV-ELISPOT and CMV-QTF in pregnant and non-pregnant women. However, only CMV-ELISPOT was significantly associated with the risk of congenital CMV infection.