

Evaluation of an electrochemiluminescence immunoassay and an enzyme-linked fluorescent assay for detection of anti-cytomegalovirus IgM and anti-toxoplasma IgM antibodies in pregnant women

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Abstract—Nowdays, it is noticed an increase in morbidity from infectious factors, among which the principal ones are viral, bacterial and parasitic infections. This is quite sensitive in pregnant women, whose infections, especially in the first trimester of pregnancy cause malformation of the fetus that is being formed. This is more complicated in cases of *Toxoplasma gondii* and Cytomegalovirus because of cross reactions of their antibodies against similar antigenic epitopes. For this reason the aim of this study was the detection of gestational Cytomegalovirus and *Toxoplasma gondii* infections. Cytomegalovirus (CMV) is a herpes virus transmitted by intimate contact with infected excretions such as saliva, urine, cervical and vaginal excretions, semen, breast milk and blood. *Toxoplasma gondii* is a parasitic protozoa which can be transmitted by eating infected meat or from mother to fetus during the first trimester of pregnancy. Because diagnosis of maternal infections solely depends on serology, routine tests with high sensitivity and specificity are required. Medical diagnostic is working to determine the most sensitive techniques for the detection of anti-cytomegalovirus IgM and anti-toxoplasma IgM antibodies, in the framework of which is developed this scientific work. This study compares an electrochemiluminescence immunoassay (ECL, applied in COBAS 6000 instrument) with an enzyme-linked fluorescent assay (ELFA, applied in MINI-VIDAS instrument) for detection of anti-cytomegalovirus IgM and anti-toxoplasma IgM antibodies in pregnant women. 400 pregnant women were involved in the study and serum samples were analyzed with both techniques. Sensitivity and specificity were evaluated and ECL immunoassay resulted with high sensitivity and specificity (98% - 100%), while ELFA immunoassay resulted with lower sensitivity and specificity (89,4% - 98,6%). The evaluation of the results showed a good concordance between the two immunoassays, but at the same time a better performance of ECL immunoassay as a first-line screening method to detect gestational Cytomegalovirus and *Toxoplasma gondii* infections. Anyway, for diagnostic purposes, the results should always be assessed in conjunction with the patient's medical history and other clinical examinations.

Keywords—Cytomegalovirus; *Toxoplasma gondii*; Electrochemiluminescence; enzyme-linked fluorescent assay; sensitivity; specificity.