A comparative study for the determination of the IgG avidity during a toxoplasmosis in pregnancy

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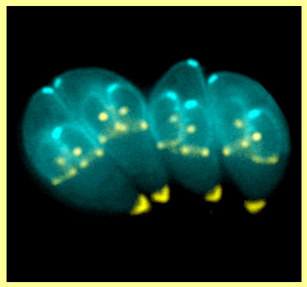
Introduction

Prenatal screening for antibodies to *Toxoplasma gondii* (*T. gondii*), rubella virus and cytomegalovirus (CMV) infectious agents is an important tool in this process. The main objective of all diagnostic efforts in toxoplasmosis serology is the clarification if a pregnant woman has an acute infection or whether infection occurred before conception (1-3). Due to the fact that in many cases low IgM titres persist beyond the acute phase of infection, determination of IgG avidity is gaining more and more in importance. The IgG response against individual *Toxoplasma* antigens differs in their avidity maturation. Thus the question arises, whether an avidity test enabling the detection of individual antigenic maturation might be more appropriate in avidity analysis. In contrast, conventional avidity tests using whole cell tachyzoite antigen might not be able to detect stage specific IgG antibody patterns and maturation. The aim of this study was to determine the seroprevalence of these infections through antenatal screening in Kocaeli region.

Materials and methods

2875 samples of sera were tested for antibodies to TORCH agents known to cause serious congenital infections: *T. gondii*, rubella, CMV. Anti-*Toxoplasma*, anti-rubella and anti-CMV IgM and IgG antibodies were assayed by ELISA method using Abbott kits (Architect, Abbott, USA) according to the manufacturer's instructions. Anti-toxoplasma IgG, IgM and IgG avidity were evaluated by ELISA method. Avidity index was measured for all samples classified as IgG positive using a commercial kit (Diagnostic BioProbes, Italy). Following the manufacturer's instructions, results were classified as low avidity (index 0.2%), equivocal (index 0.2-0.3%), and high avidity (index 0.3%).



Results

Of 2875 pregnant women, seropositivity for anti-*Toxoplasma* IgG antibody was found 28.3% while 0.4% of the subjects tested were positive for the anti-*Toxoplasma* IgM antibody, and 2.4% of the subjects tested were positive for anti-Toxoplasma IgG+IgM antibodies together. The seropositivities for anti-rubella IgG, IgM and IgG+IgM together were found in 97.2%, 0.3% and 1.9% of the pregnant women, respectively. The seropositivities for anti-CMV IgG, IgM and IgG+IgM together were found in 96.7%, 0.8% and 1.7% of the pregnant women, respectively. Pregnant women had positive IgG and IgM among which 0.3 % had low avidity which revealed an active infection in the pregnant women. In the current study, 28.3% of pregnant women had positive IgG and negative IgM, all of which had high avidity, which is an indication that in ou rpopulation the level of toxoplasmosis infection is high and most women have had contacts with this parasite before pregnancy.

Conclusions

In this study, the low avidity test was 0.3% showing that the occurrence of toxoplasmosis infection is still a serious issue. Therefore, avidity test is important in predicting maternal toxoplasmosis which is of value in disease treatment. Widespread population screening may contribute to the prevention of congenital infections due to TORCH agents. Because of the high seropositivity of *T. gondii*, rubella and CMV in pregnant women, preventive measures should be taken. Further research needs to be carried out to fill the gaps in our understanding of population structure T. gondii, pathogenesis, immunogenetics, and the entire spectrum of health outcomes associated with this highly prevalent infection.

References

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