Toxoplasma IgG Avidity Testing

The IgG avidity test was developed to help discriminate between past and recently acquired infection. Following antigenic challenge the IgG antibodies produced initially bind weakly to the antigen (low avidity). As the immune response develops there is maturation of IgG antibody response and the avidity increases progressively over weeks or months (high avidity).

The test based on the measurement of the avidity of toxoplasma specific IgG antibodies, was developed by Hedman and colleagues in Finland in 1989.

In the toxoplasma IgG avidity ELISA, urea or another protein denaturing agent is used to dissociate the antigen-antibody complex. The results (expressed as % avidity) reflect the extent of antigen antibody complex dissociation caused by the denaturing agent. The test may be performed using a single serum dilution but more accurate results are obtained by titration.

Depending on the method used the avidity tests currently available are helpful primarily in establishing that infection was not acquired in the previous 4-6 months. This is extremely useful in pregnancy where establishing timing of infection is critical for the management of the pregnancy. In the absence of antenatal screening this may need to be determined on a single sample. IgG antibodies persist lifelong and IgM can be detected for >1 year after infection. Demonstrating that the IgG antibodies are of high avidity can establish that infection was acquired before conception and there should be no risk to the foetus unless there is immunocompromise.

The test cannot be used in very early infections (eg patient 1) as the level of IgG antibody must be high enough to allow accurate measurement of the effect of the denaturing treatment (eg patient 4). In a very few patients, low avidity antibody may persist for >1 year and these patients require further study as symptoms may persist. The toxoplasma IgG avidity test is a confirmatory test and should not be used alone. When used appropriately and interpreted with other serological tests it is a very useful test.

References
