Ocular toxoplasmosis is associated principally with congenital infection and symptoms may not manifest until years (up to 20 or more) after birth. In such cases there is often no significant increase in serum levels of T. gondii-specific IgG, and no appearance of IgM. In a few cases, very low IgG levels have been associated with active ocular toxoplasmosis. Thus, serology is most useful in excluding ocular toxoplasmosis in seronegative cases.

Additional laboratory investigation that can be helpful requires the testing of aqueous or vitreous humour, and includes demonstration of the intra-ocular production of T. gondii-specific immunoglobulins or detection of the parasite by PCR or culture. Intra-ocular antibody production can be identified by the ratio of (Toxoplasma-specific:total antibody)aqueous versus (Toxoplasma-specific:total antibody)serum. This equation is termed the Goldmann-Wittmer coefficient and, if greater than 3, is considered to be significant. However, ocular fluids are rarely made available and such investigations are usually not possible.

In addition to congenitally-acquired ocular toxoplasmosis, there are a number of reports of eye disease resulting from infection acquired in childhood and adulthood. In such cases there may be a recent history of symptoms consistent with toxoplasmosis (influenza-like, illness lymphadenopathy etc.) and the presence of IgM.

Eye disease associated with toxoplasma infection can occur either due to reactivation of previously quiescent tissue cysts or, less frequently, as a result of recently acquired infection. In the immunocompetent, reactivation of tissue cysts in the eye is associated primarily with an infection acquired in utero, whereas reactivation in the immunodeficient/immunocompromised may occur as a result of an infection acquired at any time and may also be associated with concurrent reactivation of cysts in the brain.

IgM specific for Toxoplasma gondii is often not detected and serum IgG levels are often not raised during episodes of acute eye disease due to reactivation of tissue cysts. Thus serological testing is of most use in cases of suspected ocular toxoplasmosis when the patient is seronegative since this will help to exclude toxoplasma infection. Where sufficient ocular fluids and a matched serum are available, ocular toxoplasmosis can also be confirmed by demonstration of intraocular production IgG specific for T. gondii. A ratio of T. gondii-specific IgG in the eye versus serum (Goldmann-Witmer coefficient) greater than 3 is generally accepted as being consistent with active ocular infection.
The direct detection of T. gondii in ocular fluid (aqueous and vitreous humour) using a gene amplification method such as PCR provides an alternative strategy for the confirmation of ocular toxoplasmosis. Confirmation of the presence of T. gondii in ocular fluids is considered to be confirmation of active eye disease, although a negative finding does not exclude ocular toxoplasmosis. Western blotting of ocular fluid and peripheral blood can provide additional information.