Detection of antibodies to *Toxoplasma gondii* in serum from experimentally infected pregnant ewes

**INTRODUCTION**

The intracellular protozoan parasite *Toxoplasma gondii* is a major cause of foetal mortality in sheep in Ireland.

Ovine toxoplasmosis occurs following a primary infection in a pregnant sheep, as a result of the ingestion of sporulated oocysts. This infection may result in resorption, foetal death and abortion or stillborn lambs.

As part of an ongoing investigation into the immunopathogenesis of toxoplasmosis in ewes, sera from experimentally challenged ewes were tested for anti-*T. gondii* antibody.

**MATERIALS AND METHODS**

Twenty seronegative ewes were orally-inoculated with a *T. gondii* oocyst suspension at day 90 of pregnancy. Simultaneously, ten seronegative ewes were inoculated with a control non-infected suspension.

Sheep were sacrificed at days 21, 25, 28, 33 and 35 post infection. Blood samples were collected weekly from each ewe and on the day the animal was culled. Blood was also collected from the fetuses.

Sera was examined using both a commercial Latex Agglutination Test (LAT), (ToxoReagent, Mast Diagnostics, UK) and a commercial ELISA (ID Screen Toxoplasmosis, ID-Vet, France). The LAT is a semi-quantitative test which uses inactivated whole *Toxoplasma gondii* antigen. The ELISA is an indirect ELISA that utilises the P30 antigen of *Toxoplasma gondii*. The S/P value was calculated using the following formula, S/P = ODsample/ODcontrol x 100. S/P percentage values ≥50 were considered to be positive by the ID Vet ELISA. An antibody titre of 1:64 or more was considered positive by LAT.

**RESULTS**

Anti *T. gondii* antibody was evident in all infected ewes by ELISA by day 21 (Table 2). A total of 4 of the 18 animals infected with *T. gondii* were found positive by LAT (Table 2). All foetal serum was found to be negative by both serological tests.

**CONCLUSIONS**

The present study demonstrates the presence of *Toxoplasma gondii* antibody in experimentally infected ewes by ELISA and LAT. According to the ELISA, antibody levels of infected animals against *T. gondii* increase over days post infection. Neither test appears to be capable of detecting antibodies to *T. gondii* in the foetal sera of infected animals.

The ID Vet ELISA is more sensitive at detecting *Toxoplasma gondii* in the serum of experimentally infected ewes with a sensitivity of 57.44% compared to the LAT, which had a sensitivity of only 17.02%. Titres may be relatively low on the LAT as the serum samples tested were not from post-abortion animals. Both tests had high specificity, the ELISA was 98.1% specific, while the LAT was 100%.

In conclusion this study indicates that the ID Vet ELISA may be a more reliable method than the LAT to test experimentally infected animals for anti-*T. gondii* antibodies.

**REFERENCES**

(1) RVL Surveillance Report 2007
(2) Buxton et al. 2006.
(3) Esteban-Redondo & Innes 1997

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