Naturally Existing Model of Glomerulonephritis Mediated by Immune Complexes Associated with Hydatidosis in Sheep

M.I.A. Maria I. Albano Edelweiss
H.M. Helena M. Lizardo-Daudt

Dear Sir,

Experimental and clinical research has demonstrated two main mechanisms responsible for the onset of immune complex-mediated glomerulonephritis. The first occurs when an exogenous or endogenous antigen is linked to serum antibodies forming circulating immune complexes which are subsequently deposited in the glomeruli. The other mechanism refers to antibodies directed to antigens already present in the glomerulus. Glomerular involvement has been described in various parasitoses, especially in populations of endemic regions. South Brazil is an endemic area for hydatidosis. Sheep breeding is an important source of revenue for the state of Rio Grande do Sul, Brasil. Therefore, we decided to study the effects of hydatidosis on the glomeruli of these animals, since sheep are a naturally existing model.

Here we report on the early results of a prospective pilot study performed in our department, in which we studied 23 sheep slaughtered at a meat packing plant. On this occasion we found that approximately 80% of the animals had hydatidosis. Kidney tissue was collected for optical, immunofluorescence, and electron microscopy. Samples of serum, urine and hydatid fluid were also taken.

Glomerular cellular proliferation was found in 19/20 animals, thickening of the capillary wall in 16/20 and the presence of hyaline for hematic cylinders in 17/20. Indirect immunofluorescence displayed mesangial and subendothelial granular positivity in all animals, with intensities ranging from + to ++/+ ++ +. Human serum strongly positive for hydatidosis was used as a primary antibody and normal human serum as the control. With electron microscopy, the results presented dense mesangial, subendothelial and intramembranous deposits.

Fig. 1. Electron-dense deposits (D) are seen in the glomerular basement membrane. Visceral glomerular epithelial cells show foot process fusion. × 1,800.

Fig. 2. Voluminous electron-dense deposit (D) in the subendothelial localization. × 3,600.

Circulating antibodies to hydatid antigen were detected in the sera of sheep with hydatidosis. Fresh urine examination disclosed proteinuria in 8/13 animals, hematuria in 7/13 and proteinuria...
plus hematuria in 5/13. None of the findings described was seen in the control group. These very preliminary results are consistent with an immune complex mediated membranoproliferative glomerulonephritis secondary to hydatidosis and encourage us to continue this study since similar immunopathological findings may be present in humans.