Reply to Eisenhut

Lúcia Andrade and Antonio C. Seguro
Laboratory of Basic Science, Nephrology Department, University of São Paulo School of Medicine, São Paulo, Brazil

REPLY: Leptospirosis is a zoonotic disease of global importance and can be caused by any one of more than 11 species and 200 serovars of spirochetes of the genus *Leptospira* (2). In recent years, a severe form of leptospirosis, involving pulmonary hemorrhage, has emerged as a serious clinical syndrome (8, 9). The mechanisms of pathogenesis, host defense, and protective immunity remain poorly understood. Understanding the mechanisms of immunity to leptospirosis is of major importance in developing a successful vaccine against leptospirosis as well as in gaining insight into the pathogenesis of natural or induced infection.

In an article recently published in *AJP-Renal Physiology*, we investigated epithelial sodium transporter protein expression in an animal model of leptospirosis with the objective of determining the mechanisms involved in the pathogenesis of pulmonary edema in this condition (1). We found that, in pulmonary cells, expression of epithelial sodium channel protein was reduced, and NKCC1 protein expression was increased. In his Letter to the Editor regarding that same article, Eisenhut (6) has raised a very interesting point that merits further consideration and investigation.

In a kinetic study, Vernel-Pauillac and Merien (10) compared the mRNA expression levels of various cytokines in the peripheral blood mononuclear cells of *Leptospira interrogans*-inoculated hamsters. The authors observed pronounced mRNA expression of the Th1 cytokines TNF-α, interferon-γ (IFN-γ), and IL-12, with transcripts being detected as early as 1 h postinfection. In addition, the expression of anti-inflammatory cytokines, such as IL-4 and IL-10, was prominent from 1 to 4 days postinfection in response to infection with *L. interrogans*. It has also been demonstrated that levels of soluble IL-2R, IL-6, TNF-α, IFN-γ, and IL-12 are elevated in sera obtained from patients treated for acute leptospirosis (3, 7).

Eisenhut (6) has raised a very interesting point that merits further consideration and investigation.

REFERENCES


