Development of a highly specific recombinant Toxocara canis second-stage larva excretory-secretory antigen for immunodiagnosis of human toxocariasis

ABSTRACT

The specificity of the recombinant Toxocara canis antigen developed for the immunodiagnosis of human toxocariasis was compared with that of the excretory-secretory antigen from T. canis second-stage larvae (TES) by enzyme-linked immunosorbent assay. A total of 153 human serum samples from patients infected with 20 different helminths, including 11 cases of toxocariasis, were examined. No false-negative reactions were observed for the toxocariasis cases. When the TES was used at concentrations of 0.5 and 0.125 μg/ml, cross-reactions were observed in 79 (55.6%) and 61 (43.0%) of 142 cases, respectively. In contrast, when the recombinant antigen was tested at a concentration of 0.5 μg/ml, cross-reactions were observed in 19 (13.4%) of 142 cases. At a concentration of 0.125 μg/ml, however, the cross-reaction rate decreased sharply to only 2.1%, corresponding to 3 of 142 cases. The cross-reactions occurred with one case each of gnathostomiasis, paragonimiasis with Paragonimus miyazakii, and spirometriasisis, in which high antibody titers were detected. In addition, the recombinant antigen showed negative reactions with serum samples from patients infected with Ascaris and hookworms, which are the most common parasites in the world. These findings are also supported by experiments with animals infected with Ascaris and hookworm. From these results, the recombinant antigen is highly specific for toxocariasis and may provide more reliable diagnostic results than other methods.

Keyword: Toxocara canis; Toxocariasis; Recombinant antigen