Application of a modified human enzyme-linked immunosorbent assay kit for diagnosis of hydatidosis in sheep

Hashemitabar, G. R.[1*]; Razmi, G. R.[1] and Shahroozian, A.[2]

[1]Department of Pathobiology, School of Veterinary Medicine, Ferdowsi University of Mashhad, Mashhad, Iran; [2]Graduated from School of Veterinary Medicine, Ferdowsi University of Mashhad, Mashhad, Iran

[*]**Correspondence:** G. R. Hashemitabar, Department of Pathobiology, School of Veterinary Medicine, Ferdowsi University of Mashhad, Mashhad, Iran. E-mail: hashemit@um.ac.ir

(Received 15 Aug 2006; revised version 10 Dec 2006; accepted 13 Feb 2007)

Summary

Cystic hydatid disease (hydatidosis) is one of the most important zoonosis that is caused by the larval stage of *Echinococcus granulosus*. As its diagnosis by clinical symptoms alone is difficult and confusing, serologic diagnostic techniques are used to confirm the disease. These techniques can also be used for epidemiologic studies. The present study was performed with a commercial human enzyme-linked immunosorbent assay (ELISA) kit for the diagnosis of hydatidosis in sera collected from sheep with hydatidosis. Sera were collected from 68 cases of hydatidosis proven by inspection of hydatid-infested livers and lungs of the sheep slaughtered in Mashhad abattoir and also from 11 healthy cases. Sera samples were examined by ELISA kit. The results showed that out of 68 cases of hydatidosis in sheep, 67 samples had positive absorbance. Also from 11 healthy samples, 9 had negative absorbance value. The sensitivity and specificity of the test were 99 and 82%, respectively. Therefore, it can be concluded that it is possible to use human ELISA kit for the diagnosis of hydatidosis in sheep.

Key words: *Echinococcus granulosus*, Antibody, ELISA, Sheep

Introduction

Echinococcus granulosus is a major infection with worldwide distribution and variable geographical incidence (Craig *et al*., 2003). Live animals have the potential to develop the disease and need to be monitored (Kittelberger *et al*., 2002). Diagnosis of hydatidosis, besides imaging techniques (e.g., digital radiography, ultrasonography, computerized tomography and magnetic resonance imaging) and clinical findings, relies on serologic techniques (Hadighi *et al*., 2003). For development of a comprehensive immunological assay, antigenic macromolecules from every stage of the infectious agent should be considered. Purified oncosphere proteins caused strong antibody response in experimentally-immunized sheep and a recombinant oncosphere protein EG95 conferred high degree of protection in sheep, when used as a vaccine. Therefore, oncosphere protein antigen may be potentially useful in sero-diagnosis for the ruminant intermediate host of this parasite (Lightowlers *et al*., 1999). For primary sero-diagnosis and for support of clinical diagnosis of cystic echinococcosis, the selection of immunodiagnostic test involves consideration of the diagnostic operating characteristics of the technique and the purpose for which it will be used. The diagnostic sensitivity and specificity of the tests vary according to the nature and quality of the antigen and the methodologic sensitivity of the selected technology (Poretti *et al*., 1999). The availability of immunological tests with the ability to detect the majority of ruminants infected with *E. granulosus* would be desirable for animal import monitoring and also in countries where control schemes for the disease are operating (Kittelberger *et al*., 2002). Since *E. granulosus* is the most