



Immunodiagnosis of Cystic Echinococcosis Disease

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DESCRIPTION

Cystic echinococcosis is a zoonotic disease in humans, caused by larval stage of the dog tapeworm, *Echinococcus granulosus*. CE is common in rural population of underdeveloped countries because of their close association with domestic and wild animals. Early detection of developing hydrated cyst in patients is important to initiate appropriate chemotherapy. The infection is mostly asymptomatic and diagnosis of CE depends mainly on imaging methods and serological tests. Imaging methods are often too costly or not available in most of the endemic areas. Thus, serodiagnosis plays an important role, as it helps in the diagnosis of radiologically unclear cases and also in the determination of patient's immune status. The sensitivity and specificity of the serological tests depend on the stage of the disease, the localization of the parasites, the antigens and the technique used.

The sensitivity of the test depends on differences in antigen preparation or on clinical features of the patients including the number, size, location, integrity and morphology of cysts. Moreover, qualitative and quantitative antigenic variations related for example to parasite strains or host characteristics also contributes to the difference in the sensitivity. The hydrated cyst fluid is a repository of somatic and functional antigen of parasite origin. It also contains variable amounts of host proteins. Various antigenic molecules in the fluid from the parasitic cysts that develop in infected humans and the intermediate hosts of *E. granulosus* have been reported to be useful in the detection of parasite specific antibodies. Compared with the cyst fluid antigens, rather little is studied about the usefulness of other metacestode antigens of *E. granulosus* in hydrated serology.

Hence, it is suggested that there is a continued need for the identification and characterization of 'new' *E. granulosus* antigens since this may lead to the tests that have greater immunodiagnostic sensitivity and specificity than those currently in use and that may facilitate post-treatment immunosurveillance and studies on the immunopathology of CE. *E. granulosus* protoscolex is another source of antigen, which have been evaluated recently for antibody detection in CE

patients using EITB. But reports are scanty on the usefulness of the hydrated cyst wall as antigen for use in hydrated serology. Rickard raised antisera against antigen 5 and antigen B are incorporated in the antisera to study the location of hydrated specific protein on the cyst membrane and protoscolexes of *E. granulosus* using indirect immunofluorescence techniques.

The study showed that the hydrated specific protein were located on the cyst wall. In another study, *E. granulosus* Alkaline Phosphatase (EgAP) extracted from hydrated cyst membrane was used as antigen in ELISA and EITB. Both the tests showed a higher sensitivity and specificity using this antigen than using hydrated cyst fluid in the serodiagnosis of CE. In the present study, therefore, an attempt is made to evaluate the hydrated cyst wall as well as protoscolex as source of antigen, in addition to the cyst fluid for the diagnosis of CE. Recently, the isolation of parasite antigen excreted in the urine and their use as antigen following purification has opened a new approach in the serodiagnosis of few parasitic diseases such as schistosomiasis and trypanosomiasis.

CONCLUSION

However, till now there are no reports on isolation and purification of diagnostically relevant hydrated antigen excreted in the urine, for use in the serodiagnosis of CE. Purification of the parasitic antigen for their use as antigen may lead to higher specificity in the serodiagnosis. The use of purified antigens for the diagnosis of CE with good sensitivity has also been emphasized. Hydrated Cyst fluid has been used either in crude form or dialyzed cyst fluid antigen by some workers while others have employed affinity chromatography to concentrate and separate individual reactive components. It is suggested that wide use of cyst fluid antigen in the serological test for diagnosis of CE is due to the presence of high levels of specific parasite antibody in the serum that is induced by cyst fluid antigens diffused out of established metacestode.

Characterization of parasite antigen has been reported with diagnostically specific polypeptides obtained from cyst fluids. In

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the present study, an attempt is made to identify diagnostically relevant antigens from cyst wall, protoscolex and cyst fluid antigens and also from the urine of confirmed CE cases. Subsequently, the diagnostically relevant antigen from hydrated

cyst wall and urine are isolated by manual elution for their use in serodiagnosis of CE. An attempt is also made to characterize immunochemically the isolated proteins from urine and hydrated cyst wall.