Immunodiagnostic approaches for detecting *Taenia solium* [letter]

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In their recent research focus in Trends in Parasitology (19: 377-381, 2003) Ito & Craig support that ‘the most reliable serology to detect cysticercosis in humans and animals is to analyze the antibody response against specific *T. solium* antigens’. Detection of circulating antigen is given lower weight in this article because of cross-reactivity of the available tests. We would like to make the following comments on this statement. Antibody detection tests (ELISA, EITB) are the most appropriate tools for measuring exposure to *T. solium* in sero-epidemiological surveys, and for the confirmation of neurocysticercosis (NCC) as the etiological agent of epilepsy. However, as pointed out by Dorny et al. (1), antigen detection may be more indicated for other purposes such as, the detection of active cysticercosis or the follow-up of NCC patients after treatment (2, 3, 4). Although the available monoclonal antibody-based sandwich ELISAs (Ag-ELISA) are not species-specific and cross-react with *T. hydatigena* cysticerci in pigs, this should not jeopardise the diagnosis of human cysticercosis since this parasite does not occur in man. At least two Ag-ELISAs (5,6) have been sufficiently validated under experimental and field conditions to allow to draw the following conclusions as far as the diagnosis of human cysticercosis is concerned (on the basis of serum samples):

- The above-mentioned Ag-ELISAs only detect cases of active cysticercosis, i.e. the presence of living cysticerci (2,3,4,7), which may be an advantage when a decision has to be taken on whether or not antiparasitic treatment will be started according to the consensus guidelines proposed by Garcia et al. (8). Patients with only calcified cysts, who don’t need anthelmintic treatment, are consistently negative in the Ag-ELISA (7). This has also been confirmed in a pig model (9).
- For the identification of NCC as the etiological agent of epilepsy antibody detection is more appropriate than Ag-ELISA since dead cysts are more often responsible for epileptic seizures than living cysts (10).
- The sensitivity of the Ag-ELISA is very high, even in light infections. In a pig model the Ag-ELISA was able to detect single cyst infections (9).
- The Ag-ELISA is very specific, no cross-reactions were observed in sera from patients with confirmed infections with *Schistosoma*, hydatid cysts, *Ascaris*, *Trichuris*, filaria, *Entamoeba*, *Plasmodium* and *Trypanosoma* (2).
- The Ag-ELISA has proven to be an efficient tool for the follow-up of NCC patients after treatment since circulating antigen disappears within 1 to 3 months from the serum of cured patients, which is not the case if the patients are not cured (7,11).
- When used in sero-epidemiological studies antibody detection tends to overestimate the prevalence of cysticercosis because antibodies disappear within 1 to 3 years in 30 to 40 % of the seropositive people in endemic countries, reflecting a transient antibody reaction after exposure to *T. solium* eggs or a self cure (12). Antigen detection in epidemiological studies measures active cysticercosis, not merely exposure.

In conclusion, depending on the kind of information that is needed antibody or antigen detection may be more appropriate, or – optimally – a combination of both tests may be most useful, both in sero-epidemiological studies and in support of diagnosis by neuro-imaging techniques.
References