COMMENTARY

Development of point-of-care tests for *Taenia solium*: one of the ways to obtain a better diagnosis and therapeutic management of patients, and to reach eradication

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Any disease occurring in the world's poorest regions is difficult to fight, mainly due to lack of health infrastructure, personal health, and to the frequent economic difficulties in providing appropriate and effective treatment. Infections disproportionately affect populations living in these areas and clearly contribute to the cycle of poverty [1].

The neglected tropical disease, neurocysticercosis (NCC), is the parasitic disease that most frequently affects the central nervous system (CNS), corresponding to the localization of *Taenia solium* (*T. solium*) larvae in the CNS [2]. Due to the characteristics of the parasite's life cycle, this disease is closely related to poverty, of which it can be considered a marker. Endemic areas are usually isolated areas, characterized by a lack of basic services, hygiene and health centers. The situation is all the more complicated as NCC definitive diagnosis requires the realization of neuroradiological confirmation via CT scan or MRI, both absent in rural areas. In addition, therapy may necessitate emergency management, especially in cases of intracranial hypertension requiring the placement of a ventriculoperitoneal shunt.

In this context, the use of point-of-care (POC) serological tests can be very useful [3]. Ideally, these tests could be used in rural areas to guide diagnosis, which would allow patients to be appropriately referred to radiology departments, resulting in better early management, and a decrease of morbi-mortality.

Lee et al. [4], present the results of a POC test based on quantum dots with a mobile phone reader for detection of specific antibody responses. While its sensitivity and specificity were similar to those of other assay platforms, the advantage of the present test over other developed POC tests is that it provides quantitative results which could be important to assess the severity of the infection.

The article is of high interest because the development of effective POC devices is one of the best ways to improve diagnosis and to provide early therapeutic management of patients from remote areas. These types of devices have been developed for other

infectious diseases and the results of the proof-of-concept studies are promising [5].

For *T. solium* infections, different devices should be developed. In particular, future investigations should consider a device that combines the detection of antigens with the detection of antibodies. As previously demonstrated, the detection of specific antigen is evidence of the presence of viable parasites and this type of 'combined' device could be of even greater utility for improving patient referral to the hospital. In addition, devices allowing the detection of markers specific to the adult phase of the parasite could be developed as previously suggested [3]. In this case, such devices could allow rapid treatment of patients and evaluation of the success of treatment directly in rural areas. Knowing that the diagnosis and treatment of the carrier of the adult form of *T. solium* is one of the ways to eliminate this parasitosis, this type of device should help progress elimination efforts. Finally, devices for assessing environmental contamination with *Taenia solium* eggs could also be important to develop in order to define endemic areas and for guiding and prioritizing where control programs should be implemented.

In conclusion, it is certain that the development of these new technologies has the capacity to revolutionize the diagnosis and therapeutic approach of various diseases related to poverty. It is also certain that they will only be useful if the costs are reasonable [6]. Investigations in this direction should be continued.

Disclosure statement

No potential conflict of interest was reported by the author.

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