

## Commentary

Neglected tropical diseases (NTD) are diseases which affect the world's poorest countries. The term "NTD" is a collective term used for diseases sharing a few common characteristics like being more common in tropical countries and the fact that most of them have been neglected by researchers and health policy makers alike.<sup>[1]</sup>

Neglected zoonotic diseases are a subset of the neglected tropical diseases. Zoonoses are diseases that are naturally transmitted from vertebrate animals to humans and vice-versa.<sup>[2]</sup> Human cysticercosis is considered as a "neglected zoonotic disease" (NZDs). Other NZDs are diseases such as anthrax, bovine tuberculosis, brucellosis, CE (hydatid disease), and rabies.

Cysticercosis in humans is the larval stage infection of the pork tapeworm *Taenia solium* while taeniasis is the intestinal infection with adult tapeworms. Inside the body, cysticerci can develop in a number of tissues; those that are located in the central nervous system cause neurocysticercosis, the most severe form of the disease. Neurocysticercosis (NCC) is the most common parasitic infection of the central nervous system (CNS) and the single most common cause of epilepsy in the developing countries. NCC is endemic in many parts of the world including India, Mexico, parts of Central and South America, and Africa.<sup>[1,2]</sup> Together with the growing number of immigrants from endemic areas, there has been a recent increase in the number of patients with NCC in the developed world. Almost 90% of NCC

patients diagnosed in the USA and Europe are Latin American immigrants.<sup>[3,4]</sup>

Spinal cysticercosis is quite rare. Its incidence has been reported as only 1.5-3%. It can be vertebral, extradural, intradural, and intramedullary. Leptomeningeal is the most frequent, intramedullary is quite rare and epidural is an extremely rare form. Migration of the cysticerci through the ventriculo-ependymal pathway and hematogeneous dissemination has been identified to be the possible pathogenetic mechanisms. The higher incidence of spinal NCC in the thoracic region may be related to the high blood flow in the thoracic segment. It occurs in patients with previous intracranial NCC in approximately 75% of the cases, and isolated cases of spinal NCC either intramedullary or extramedullary are considered to be very rare.<sup>[5-7]</sup>

The mainstays of diagnosis are imaging methods and immunodiagnostic tests for antigen and antibody detection.

CT and MRI findings are characteristic such as the appearance of the scolex within a cyst known as "hole-in-dot" sign, considered pathognomonic for cystic lesions of NCC.

Although imaging methods are extremely useful, their major shortcoming is their cost and the fact that facilities and infrastructure for these imaging techniques is for the most part not available in rural areas and underdeveloped areas where the major disease burden lies.

Among the serological tests available for detecting antibodies against *T. solium* for diagnosis of cysticercosis, ELISA formats are preferred in developing countries because of their simplicity and lower cost as compared to other more specific tests like enzyme linked immunoelectrotransfer blot (EITB). Some studies support the antigen detection in cerebrospinal fluid (CSF).<sup>[1]</sup>

Despite the above-mentioned advances in neuroimaging and immune diagnostic tests, the diagnosis of NCC is a challenge in many patients. Clinical manifestations are nonspecific, neuroimaging findings are most often not pathognomonic, and serological tests are faced with problems related to relatively poor specificity and sensitivity. A set of diagnostic criteria based on the objective evaluation of clinical, radiological, immunological, and epidemiological data has been proposed by Del Brutto *et al.*<sup>[3]</sup> to provide the physicians with elements to diagnose patients with suspected NCC.

The introduction and subsequent widespread use of two potent cysticidal drugs (praziquantel and albendazole) have drastically changed the prognosis of most patients with NCC. Albendazole has been superior to praziquantel in trials comparing the efficacy of these drugs. Cysticidal drugs must be used with caution because the inflammatory reaction developed by the host in response to the acute destruction of the parasite may occlude leptomeningeal vessels surrounding the cyst; concomitant steroid administration is mandatory.

Treatment of spinal cysticercosis is still controversial. The management is primarily surgical, especially in the presence of progressive neurological dysfunction and when the diagnosis is doubtful. Medical treatment of intramedullary spinal cysticercosis can be considered in patients with a stable neurological status and in cases diagnosed by CSF assay. However, in patients presenting with acute or progressive neurological state, and in those where the diagnosis is missed or is in doubt, surgical excision is the choice of treatment as histopathology not only confirms the diagnosis, but early surgery also provides recovery before any irreversible cord damage takes place. Postoperatively, anticysticercal drugs should be instituted.<sup>[6-8]</sup>

Human cysticercosis is more commonly seen in populations lacking basic sanitation facilities and living in close proximity to livestock.<sup>[1]</sup> To be effective, eradication programs must be directed to all the targets for control, particularly human carriers of the adult tapeworm, infected pigs, and eggs in the environment.<sup>[3]</sup> As yet, there is no vaccine available for humans. Vaccination of pigs to control human *T. solium* infection might be feasible. The mainstays of prevention are public awareness and education, careful hand hygiene, appropriate sanitation, and avoidance of undercooked pork and vegetables to reduce the prevalence of definitive hosts.

In this issue, Qazi *et al.*<sup>[9]</sup> describe a new case of isolated intramedullary spinal cord cysticercosis to contribute to keep in mind this rare entity.

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