

Commentary

Neurocysticercosis is the most common helminthic brain infection and a leading cause of seizure disorders worldwide.^[1] It is also one of the few infectious diseases that has been declared potentially eradicable by the International Task Force for Disease Eradication.^[2]

Neurocysticercosis affects only humans and pigs and only in humans can the *Taenia solium* parasites mature into adult tapeworms in the intestinal tract. Although these tapeworms can grow up to 7 meters long, they cause only mild inflammation, are not invasive, and affected persons generally remain asymptomatic. However, without adequate hygiene and stool disposal, asymptomatic *taenia* carriers pose great risk of infection with neurocysticercosis to others. Often unknowingly, they shed hundreds of thousands of infectious eggs into the environment. If accidentally ingested by other humans or pigs through contaminated food or unsanitary

practices, the *taenia* eggs can hatch in the intestines and migrate into body tissues including muscles, eyes, and brain resulting in significant morbidity. With poor hand hygiene, *taenia* carriers can also autoinfect themselves and thus also develop neurocysticercosis. The tissue burden in some individuals with cysticercosis is dramatic.^[3,4]

In this issue, Joshi *et al.* present a remarkable case of a man who has had a recurrence of intraventricular neurocysticercosis causing hydrocephalus after apparent successful treatment for the same condition just two and a half years previously.^[5]

Even more remarkable than the possibility that this patient had symptomatic re-infection with neurocysticercosis is the fact that both times the larvae may have traveled to the brain and entered just the ventricles and not elsewhere in the brain parenchyma. Conventional wisdom is that

the *Taenia solium* parasites do not have strong tropism for any particular tissue and enter the brain by chance alone. If this man really did have re-infection underlying his recurrence, it would suggest that there may be factors other than chance alone that lead to recurrent cyst entry into his ventricles. As the authors point out, although he did have follow-up MR imaging that documented no residual intraventricular cysts, it is possible that there was a small residual cyst that was initially missed on imaging. Although the patient was prescribed a course of albendazole, it is not clear if he actually completed this treatment, allowing that possible residual small cyst to survive and later become symptomatic.

It is notable that his cysticercosis serology was negative, highlighting the fact that sensitivity of serology is limited in patients with few cysts.^[6] The isodense appearance of the intraventricular cysts on CT scans further complicates their detection, and the diagnosis of intraventricular neurocysticercosis typically requires an astute clinician and an MR scan.

Treatment of parenchymal and intraventricular NCC is complicated by inflammatory reactions, risks of seizures, ventriculitis, and encephalitis. As in the case, presented treatment may require neurosurgical intervention and is often very challenging.^[7] For intraventricular cysts, neuroendoscopic extirpation may be the best treatment, unfortunately this procedure does carry risk and is not available in most settings. In comparison to neurocysticercosis, the treatment of infectious carriers of adult tapeworms is very easy. A single dose of praziquantel or a single dose of niclosamide are both effective.^[8] Unlike praziquantel, niclosamide is not absorbed and remains in the lumen of intestine where it kills just the adult tapeworms leaving tissue cysts undisturbed.

As the adage goes, an ounce of prevention is worth a pound of cure. Every diagnosed case of neurocysticercosis is an opportunity for prevention. The patient should be treated for taeniasis and household members, domestic help, or other individuals who may be possible source cases should be screened and treated.^[9] Hygiene and

sanitation and culinary practices should be questioned and good practices reinforced.

The role of animals (pigs) in cysticercosis transmission is an excellent example of the one health concept and the need for us to consider animal welfare. With exemplary individual patient care combined with attention to public and animal health, we can progress towards eradicating this disease.

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