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Taenia solium, the Most Important Foodborne Zoonotic Parasite: Is Elimination Possible? An Example from Zambia

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Abstract

Taenia solium, the number one foodborne parasite (FAO/WHO), has been extensively studied in Zambia in people and pigs, and found to be highly prevalent. Human act as final hosts, with the adult tapeworm lodging in the intestines (taeniosis) and excreting eggs into the environment via the stool. Pigs, the intermediate hosts, obtain the infection via ingestion of infected stool/feed/water contaminated with parasite eggs which develop into cysticerci (porcine cysticercosis), primarily in the muscles. People acquire the tapeworm via consumption of insufficiently cooked infected pork. However, human can also act as accidental intermediate host when ingesting food/water contaminated with eggs, and develop cysticercosis. The cysticerci have a tendency to lodge in the central nervous system and cause neurocysticercosis. With 57 % of people with active epilepsy diagnosed with probable or definitive neurocysticercosis in Zambia, suggesting *T. solium* to be the single most important cause of epilepsy, control is urgently needed. We have assessed the impact of different control interventions on occurrence of *T. solium* in people and pigs in the Zambian setting.

In an ongoing intervention study, the use of human mass drug administration (praziquantel) and health education; combined with pig treatment (oxfendazole) and vaccination (TSOL18 vaccine) in a four-monthly administration system for six iterations has been assessed for its potential to eliminate the parasite's transmission. This study 'elimination' study arm (5 villages and 2 farms, 1,210 people, 520 pigs) is compared with a 'negative control' study arm (7 villages, 1,272 people, 591 pigs). At baseline, 16 % and 27 % of the people tested taeniosis and cysticercosis positive, respectively. Fifty six percent of the pigs were found infected, with no differences between the study areas. After the 6 interventions in the elimination study arm, only 4 % of the tested pigs were found positive versus 50 % of the pigs from the negative control study arm. Further results and challenges encountered will be presented.

Keywords: Cysticercosis/taeniosis, elimination, One Health, *Taenia solium*, Zambia

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