

Vaccine to stop pig parasite could reduce human disease

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A pig lying on straw bedding. Credit: Wellcome Images

(PhysOrg.com) -- A vaccine against the tapeworm *Taenia solium* has eliminated transmission of the parasite in pigs in a field trial in Africa. It is hoped that the vaccine could indirectly reduce the incidence of a debilitating neurological disease in humans.

Taenia solium is transmitted among humans and also between humans and [pigs](#). Pigs are infected by ingesting food contaminated with human faeces containing the parasite's eggs. In countries without proper sanitation, and where pigs and humans live in close quarters, there is a constant cycle of re-infection from the parasite.

In humans the infection causes neurocysticercosis - the most frequent preventable cause of epilepsy in the developing world. Seizures are the most common symptom, but infection can also cause blindness, meningitis, [dementia](#) and in some cases death.

Attempts to control the disease by treating infected humans have had limited success because the parasite can remain in the pig population of endemic areas. Similarly, treating pigs with drugs is effective at killing the parasite but does not prevent re-infection. And [parasites](#) killed by the drugs also cause unsightly lesions in the meat, making it unsuitable for sale.

Vaccinating pigs offers a relatively inexpensive approach to controlling the spread of the parasite and indirectly reducing the number of new cases of human disease. TSOL18 is one such vaccine that has proven extremely effective in protecting pigs against experimental exposure to the parasite.

In a study funded by the Wellcome Trust, Emmanuel Assana and colleagues conducted a pilot field trial of TSOL18 in the far north of Cameroon - an area where pigs are naturally exposed to the faeces of humans infected with the parasite.

[Piglets](#) were vaccinated at two to three months of age and given booster immunisations after four weeks and again four months later. At the time of the second immunisation, the pigs were also treated with drugs to kill any parasites that may have established themselves prior to vaccination. The pigs were then allowed to roam free around the village, as is typical of local farming practices.

At the end of the study, around one in five of the untreated pigs were infected with the parasite, most of them with thousands of parasites. But, the team found, none of the vaccinated animals had become infected. Also, any [lesions](#) caused by dying parasites following drug treatment had disappeared over the nine-month period before slaughter, improving the quality of meat from vaccinated animals.

The findings are published in the April issue of *International Journal for*

Parasitology'.

Professor Marshall Lightowlers, who led the research said: "We were delighted to see that the vaccine completely eliminated transmission of the parasite in the pig population in a natural setting. The procedure we used was relatively simple and sustainable, so it has a genuine potential to form the basis for widespread control of the parasite's transmission. This could ultimately lead to a reduction, or elimination, of the human brain disease known as neurocysticercosis".

"This disease has been identified as one that could be eradicated from the globe, so this is a very significant hurdle which means the end is well and truly in sight" Professor Lightowlers added.

More information: Emmanuel Assana et al. Elimination of *Taenia solium* transmission to pigs in a field trial of the TSOL18 vaccine in Cameroon. *Int J Parasitol.* 2010;40(5):515-519.

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Provided by Wellcome Trust

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