

Rats sniff out tuberculosis in children

April 9 2018



Credit: CC0 Public Domain

Rats are able to detect whether a child has tuberculosis (TB), and are much more successful at doing this than a commonly used basic microscopy test. These are the results of research led by Georgies Mgode of the Sokoine University of Agriculture in Tanzania.

The study, published by Springer Nature in *Pediatric Research*, shows that when trained rats were given children's sputum samples to sniff, the animals were able to pinpoint 68 percent more cases of TB infections than detected through a standard smear [test](#). Inspiration for investigating the diagnosis of TB through smell came from anecdotal evidence that people suffering from the potentially fatal lung disease emit a specific odour. According to Mgode, current TB detection methods are far from perfect, especially in under-resourced countries in Sub-Saharan Africa and South East Asia where the disease is prevalent, and where a reasonably cheap smear test is commonly used. Problems with this type of test are that the accuracy varies depending on the quality of sputum sample used, and very young children are often unable to provide enough sputum to be analysed.

"As a result, many children with TB are not bacteriologically confirmed or even diagnosed, which then has major implications for their possible successful treatment," explains Mgode. "There is a need for new diagnostic tests to better detect TB in children, especially in low and middle-income countries."

Previous work pioneered in Tanzania and Mozambique focussed on training African giant pouched rats (*Cricetomys ansorgei*) to pick up the scent of molecules released by the TB-causing *Mycobacterium tuberculosis* bacterium in sputum. The training technique is similar to one used to teach rats to detect vapours released by landmine explosives. In the case of TB, when a rat highlights a possibly infected sample, it is analysed further using a WHO endorsed concentrated microscopy techniques to confirm a positive diagnosis.

Sputum samples were obtained from 982 children under the age of five who had already been tested using a microscopy test at clinics in the Tanzanian capital of Dar es Salaam. From the smear tests, 34 [children](#) were confirmed to have TB. When the same samples were placed out for

the rats to examine, a further 57 cases were detected and then confirmed after being examined under a more advanced light emitting diode fluorescence microscope.

The news about the additional cases confirmed by endorsed concentrated smear microscopy was passed onto the relevant clinics, and efforts were made to track down infected patients so that they could start their much-needed treatment.

"This intervention involving TB screening by trained [rats](#) and community based patient tracking of new TB patients missed by hospitals enables treatment initiation of up to 70%. This is a significant proportion given that these additional patients were considered TB negative in hospitals, hence were initially left untreated," adds Mgode.

More information: Georgies F Mgode et al, Pediatric tuberculosis detection using trained African giant pouched rats, *Pediatric Research* (2018). [DOI: 10.1038/pr.2018.40](https://doi.org/10.1038/pr.2018.40)

Provided by Springer

Citation: Rats sniff out tuberculosis in children (2018, April 9) retrieved 6 May 2024 from <https://medicalxpress.com/news/2018-04-rats-tuberculosis-children.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.