

Study establishes most effective technique for diagnosing childhood tuberculosis in poor countries

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A tuberculosis (TB) culture method called microscopic-observation drug-susceptibility (MODS), using two gastric aspirate specimens from each child tested, is significantly more sensitive and faster than conventional culture tests, diagnosing 70% more cases of pulmonary TB among children ages 12 years and under. This is the best available diagnostic test for confirming paediatric pulmonary tuberculosis in resource-poor settings, particularly in children with strong clinical evidence of TB, concludes an Article published Online First and in the August edition of the *Lancet Infectious Diseases*.

The diagnosis of pulmonary TB is difficult in children because symptoms are non-specific, respiratory specimens are difficult to obtain, and even in the best conditions *Mycobacterium tuberculosis* is confirmed in less than half of children with clinically diagnosed TB.

In this study, Richard Oberhelman from the Tulane School of Public Health, New Orleans, USA, and international colleagues compared the accuracy of new diagnostic techniques for pulmonary tuberculosis in children in a resource-poor area.

218 children with suspected pulmonary TB (cases) were enrolled from two hospitals in Lima, Peru, between August 2002 and January 2007. The cases were grouped into moderate-risk and high-risk categories based on [clinical evidence](#) of TB, and age and sex matched with 238

healthy controls. Two specimens of nasopharyngeal aspirates, stool samples and gastric aspirates were taken from each case and examined for *M. tuberculosis* using MODS culture, standard Lowenstein-Jensen culture, and a heminested [polymerase chain reaction](#) (PCR) test.

22 children had culture-confirmed TB. *M. tuberculosis* was isolated from gastric aspirate in all 22 cases compared to four cases from stool samples and 12 cases from nasopharyngeal aspirate.

Importantly, adding a duplicate sample increased diagnostic yield by 37%—the first gastric aspirate sample was culture positive in 16 (72.7%) of 22 patients and the second in six (27.3%) of 22 patients.

MODS almost doubled the sensitivity of detecting TB compared with the conventional Lowenstein-Jensen method, diagnosing 20 (90.9%) of 22 patients compared with 13 (59.1%), and in less than half the time (10 days vs 25 days).

The authors note that although PCR was not specific or sensitive enough for routine diagnosis, in high-risk children gastric aspirate PCR rapidly identified half of all culture positive cases, and could be useful as a screening test in these children.

They conclude: "Collection of duplicate gastric-aspirate specimens from high-risk children for MODS culture increased microbiological diagnosis of tuberculosis by more than a third...and was the best available [diagnostic test](#) for [pulmonary tuberculosis](#)."

In a Reflection and Reaction, Stephen Graham from the University of Melbourne in Australia, discusses the problems surrounding research into tuberculosis diagnosis in children and says: "The recognised difficulties with confirmation of diagnosis have contributed to a common, and perhaps erroneous, perception that the diagnosis of

childhood tuberculosis is always difficult. Clinical diagnosis is fairly straightforward in many patients and this unnecessary negative perception can be a barrier to improving clinical management, supporting child tuberculosis research, and reporting of disease burden."

Provided by Lancet

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