

## Kids Cohort: Pitfalls of childhood tuberculosis diagnosis in high burden and limited resource settings.

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### Background

Diagnosing tuberculosis in children is very challenging, especially in high-burden resource-limited settings. We report the diagnostic findings of a cohort of children with clinical suspicion of tuberculosis at the Mbarara Regional Referral Hospital.

### Methods

All children suspected of tuberculosis aged between one month and 14 years received a comprehensive and standardized clinical and biological evaluation including XpertMTB/RIF assay and tuberculosis culture and use of induced sputum in children unable to expectorate. After initial assessment, children with any positive tuberculosis bacteriological test, chest x-ray or clinical presentation that were suggestive of tuberculosis disease were started on treatment. Stools collected from children on treatment were tested with XpertMTB/RIF. At the end of the study, two independent experts reviewed patients' files to classify cases using the 2012 standard case definitions of intra-thoracic tuberculosis.

### Results

Of 392 children enrolled, 45.4% were female, 58.1% were younger than 5 years old, 30.1% were HIV-infected and 19.4% had a tuberculosis contact history

within the last year. Children < 2 years presented more frequently with severe malnutrition (26.4% vs 5.3%) and were more likely to be diagnosed with a tuberculosis suggestive chest X-ray (50.8% vs 29.2%) compared to children from other age groups. A quarter (25.8%) of the children were tuberculin skin test positive.

Nineteen children (4.8%) were confirmed tuberculosis cases: 18 were either culture or Xpert positive for MTB on respiratory samples and 1 was positive on extra-pulmonary sample. Xpert MTB/RIF on stool had a sensitivity of 57.1% and specificity of 98.2%. Using the standard tuberculosis case definitions, a total of 58/373 (15.4%) children were classified as confirmed or probable tuberculosis. In total, 144 (36.7%) were started on treatment.

### Conclusion

This study confirms the difficulties with diagnosing childhood tuberculosis. The majority of cases were diagnosed without confirmation of tuberculosis despite the use of exhaustive diagnostic tests and optimised specimen collection. Rapid, non-sputum based and highly sensitive tests are still needed for diagnosis of childhood tuberculosis. Meanwhile, every opportunity should be taken to improve tuberculosis diagnosis especially among children presenting with severe clinical conditions.