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Diagnostic Performance of Xpert MTB/RIF Assay in Adults with Presumed Pulmonary Tuberculosis at Uyo, Nigeria

*Performance Diagnostique du Test Xpert MTB/RIF chez les Adultes
Présumés Atteints de Tuberculose Pulmonaire à Uyo, Nigeria*

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ABSTRACT

BACKGROUND: Tuberculosis (TB) is a disease of immense public health importance in sub-Saharan Africa. Xpert MTB/RIF assay, a relatively recent, rapid molecular testing modality offers potential solutions to most of the challenges associated with TB diagnosis.

OBJECTIVE: This study determined the diagnostic performance of Xpert MTB/RIF assay in adults with presumed pulmonary tuberculosis (PTB).

METHODS: This was a descriptive cross-sectional study involving consenting adults with presumed PTB at the University of Uyo Teaching Hospital, Uyo, southern Nigeria. A structured questionnaire was used to collect participants' data. All participants submitted 2 sputum samples (spot and early morning). Sputum smear microscopy, Xpert MTB/RIF assay and mycobacterial culture were done. They also had chest radiography.

RESULTS: They were 230 participants in the study. Seventy-nine (34.3%) patients were living with HIV. Xpert MTB/RIF assay detected MTB in 65 (28.3%) patients with 2 (3.1%) of them having rifampicin resistance. *M. tuberculosis* was isolated from sputum culture in 69 participants while the result was negative in 151 participants. The culture results of these 220 patients were used as the reference standard for the determination of the sensitivity and specificity of Xpert MTB/RIF assay. The overall sensitivity and specificity of the assay were 88.4% and 98.7% respectively. Younger age, longer duration of cough, weight loss, low body mass index (BMI) and positive smear status were independent factors associated with MTB detection using the assay.

CONCLUSION: Xpert MTB/RIF assay is a highly sensitive and specific modality for pulmonary TB diagnosis when compared with mycobacterial culture, which is the gold standard.

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KEYWORDS: Diagnosis, Nigeria, Sputum, Tuberculosis, Xpert MTB/RIF

RÉSUMÉ

CONTEXTE: La tuberculose (TB) est une maladie d'une immense importance en matière de santé publique en Afrique subsaharienne. Le test Xpert MTB/RIF, une modalité récente et rapide de test moléculaire, offre des solutions potentielles aux nombreux défis associés au diagnostic de la TB.

OBJECTIF: Cette étude a évalué la performance diagnostique du test Xpert MTB/RIF chez des adultes présumés atteints de tuberculose pulmonaire (TP).

MÉTHODES: Il s'agit d'une étude descriptive transversale impliquant des adultes consentants présumés atteints de TP à l'hôpital universitaire de Uyo, dans le sud du Nigeria. Un questionnaire structuré a été utilisé pour recueillir les données des participants. Tous les participants ont fourni 2 échantillons de crachat (spot et tôt le matin). Une microscopie des frottis de crachat, un test Xpert MTB/RIF et une culture mycobactérienne ont été réalisés. Une radiographie pulmonaire a également été effectuée.

RÉSULTATS: L'étude a inclus 230 participants. Soixante-dix-neuf (34,3 %) patients étaient séropositifs. Le test Xpert MTB/RIF a détecté MTB chez 65 (28,3 %) patients, dont 2 (3,1 %) présentaient une résistance à la rifampicine. *Mycobacterium tuberculosis* a été isolé à partir de la culture du crachat chez 69 participants, tandis que le résultat était négatif chez 151 participants. Les résultats de culture de ces 220 patients ont été utilisés comme référence pour déterminer la sensibilité et la spécificité du test Xpert MTB/RIF. La sensibilité et la spécificité globales du test étaient respectivement de 88,4 % et 98,7 %. Un âge plus jeune, une durée prolongée de la toux, une perte de poids, un indice de masse corporelle (IMC) bas et un frottis positif étaient des facteurs indépendants associés à la détection de MTB par le test.

CONCLUSION: Le test Xpert MTB/RIF est une modalité hautement sensible et spécifique pour le diagnostic de la TB pulmonaire comparé à la culture mycobactérienne, qui reste le standard de référence.

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MOTS-CLÉS: Diagnostic, Nigeria, Crachat, Tuberculose, Xpert MTB/RIF.

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Abbreviations - BMI: Body mass index; **DOTS:** Directly observed treatment short-course; **ESR:** Erythrocyte sedimentation rate; **HIV:** Human immunodeficiency virus; **HAART:** Highly active antiretroviral therapy; **MTB:** *Mycobacterium tuberculosis*; **PTB:** Pulmonary tuberculosis; **PLHIV:** Persons living with HIV; **RIF:** Rifampicin; **WHO:** World Health Organization