Grace Kaguthi, J Pulm Respir Med 2015, 5:3
http://dx.doi.org/10.4172/2161-105X.S1.007

OMICS International
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International Conference and Exhibition on
Lung Disorders & Therapeutics
July 13-15, 2015 Baltimore, Maryland, USA

Chest radiographs for pediatric TB diagnosis: Inter-rater agreement and utility

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The chest radiograph (CXR) is considered a key diagnostic tool for pediatric tuberculosis (TB) in clinical management and endpoint determination in TB vaccine trials. We set out to compare inter-rater agreement for TB diagnosis in western Kenya. A pediatric pulmonologist and radiologist (experts), a medical officer (M.O), and four clinical officers (C.Os) with basic training in pediatric CXR reading blindly assessed CXRs of infants who were TB suspects in a cohort study. C.Os had access to clinical findings for patient management. Weighted kappa scores summarized inter-rater agreement on lymphadenopathy and abnormalities consistent with TB. Sensitivity and specificity of raters were determined using microbiologically confirmed TB as the gold standard (n = 8). A total of 691 radiographs were reviewed. Agreement on abnormalities consistent with TB was poor; k = 0.14 (95% CI: 0.10–0.18) and on lymphadenopathy moderate □ = 0.26 (95% CI: 0.18–0.36). M.O [75% (95% CI: 34.9%–96.8%)] and C.Os [63% (95% CI: 24.5%–91.5%)] had high sensitivity for culture confirmed TB. TB vaccine trials utilizing expert agreement on CXR as a non-microbiologically confirmed endpoint will have reduced specificity and will underestimate vaccine efficacy. C.Os detected many of the bacteriologically confirmed cases; however, this must be interpreted cautiously as they were un-blinded to clinical features.

Biography

Grace Kaguthi is a medical doctor and clinical trialist with the Centre for Respiratory Diseases Research (KEMRI). She is currently pursuing her PhD in Tuberculosis epidemiology at the University of Amsterdam. She is a Lead Investigator in phase II and phase III trials of novel tuberculosis vaccines, treatments for sickle cell disease, malaria and tuberculosis treatment trials. She is a member of the Ethics Review Unit at the Kenya Medical Research Institute which reviews and approves research protocols.

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