Diagnostics and biomarkers

PO - (8596) - ENHANCING LABORATORY DIAGNOSIS OF MYCOBACTERIUM TUBERCULOSIS IN SAMPLES FROM CHILDREN IN THE GAMBIA

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Background: Routine laboratory diagnostic methods for M. Tuberculosis complex (MTBC) in induced sputum samples such as smear microscopy, GeneXpert and liquid Mycobacteria growth indicator tube (MGIT) culture are often negative due to the paucibacillary nature of childhood tuberculosis. We hypothesise that prolonged incubation beyond routine culture time could potentially improve MTBC detection in specimens.

Design/Methods: Out of over 1000 induced sputum samples collected during our childhood TB contact tracing research program, we randomly selected 102 MTBC-negative MGIT cultures that had either been reported as contaminated (n=35) or negative (n=67) and further incubated these at 37°C for the duration of one month. Ziehl-Neelsen microscopy, MPT64 Antigen secretion and GeneXpert tests were repeated on all samples to detect MTBC. Bacterial DNA was extracted by CTAB method and genotyped using Spoligotyping analysis.

Results: Of the 1160 routinely collected induced sputum samples 12 (1%) were smear positives; 41 (3.5%) Xpert positives and 51 (4.4%) MGIT culture MTBC positives. The remaining MGIT cultures were flagged as contaminated 393 (33.9%) or MTBC negative 644 (55.5%). After prolonged incubation and retesting of the randomly selected ones, 26/102 (25.5%) were now microscopy positive, 2/55 (3.63%) were GeneXpert positive, 8/102 (7.8%) MPT64-Antigen positive, and 38/102 (37.2%) had readable spoligotyping patterns. The predominant lineages were Mtb-Euro-American 16 (42.1%), Mtb-Indo-Oceanic 11 (28.9%) and M. africanum West African type-2 8 (21%).

Conclusions: Prolonged incubation of routinely MTBC-negative induced sputum cultures yielded positive results upon retest, highlighting the low sensitivity of routine diagnosis tools on pauci-bacillary paediatric samples. Spoligotyping was more sensitive to detect MTBC compared to GeneXpert. However, prolong incubation will cause diagnostic delays and thus better strategies are needed to improve timely childhood TB diagnosis.

Keywords: - MTBC, Smear Microscopy, GeneXpert, MGIT culture contaminants, Spoligotyping.