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Evaluation of the Copan Myco-TB kit for the decontamination of respiratory samples for the detection of mycobacteria

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Background: Respiratory samples submitted for mycobacteria culture contain normal flora, contaminants and large amounts of mucus. Since mycobacteria culture requires long incubation times, laboratory detection and identification pose challenges. Decontamination procedures are used to deal with this problem. Copan (Brescia, Italy) developed the Myco-TB procedure, a ready to use decontamination and fluidization kit for the detection of mycobacteria. The goal of this study was to compare it with the decontamination procedure in use in our hospital: the Zephiran method. Since the latter is incompatible with the BACTEC™ MGIT™ 960 system for mycobacterial detection (BD, New Jersey, USA), it was only used with the Myco-TB kit while both methods were followed by culture on solid media**.**

Material/methods: Respiratory specimens (n=295: 78 bronchial aspirates, 152 bronchoalveolar lavages, 55 expectorated sputa, 10 endotracheal aspirates) submitted to the UZ Brussel between January-July 2016 were included and divided into two aliquots. One was subjected to the Myco-TB method and one to the Zephiran technique. Samples incubated with the mycosolution were vortexed for 30 seconds, incubated for 3 minutes at room temperature, centrifuged for 5 minutes at 3000 G and the supernatant was used for preparing a smear. After decontamination, the samples were processed for auramine staining and culture by inoculating one Löwenstein-Jensen and one Ogawa slant. For the Myco-TB method, samples were also cultured in the MGIT system.

Results: A total of 25 mycobacteria (13 M. tuberculosis complex, 5 M. avium, 1 M. chimaera intracellulare, 1 M. gordonae, 3 M. xenopi, 1 M. marseillense, 1 M. peregrinum) were recovered. Eighteen of them were cultured with the Zephiran method on solid media (sensitivity 72%), 22 with the Copan method on solid media (sensitivity 88%) and 23 with the Copan method on the MGIT system (sensitivity 92%). On direct microscopy, 8 of the smears were positive with the Zephiran method (sensitivity 32%) and 5 of them (sensitivity 20%) with the Copan method. Twenty-six % of the samples were contaminated with the Zephiran method on solid media, 22% with the Copan method on solid media and 2% with the Copan method on the MGIT system. The specificities for culture were all 100%.

Conclusions: The Myco-TB decontamination method is easy and rapid to perform (Zephiran 95 min versus Copan 10 min). It can be used for one specimen at a time so it can eliminate the possibility of cross contamination. It is more sensitive with respect to culture compared to the Zephiran method and gives lower contamination levels, especially when combined with the MGIT technique. However, our results suggest that the Copan method is less sensitive in direct microscopy, probably due to lower pellet volume. Higher sensitivity can probably be obtained when PCR techniques are combined.