

USE OF THE METHOD FOR DETERMINING MINIMUM INHIBITORY CONCENTRATIONS IN A LIQUID MEDIA FOR SUSCEPTIBILITY TESTING OF NON-TUBERCULOSIS MYCOBACTERIA

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Abstract

The aim of the study was to analyze drug resistance (DR) of some types of non-tuberculosis mycobacterium (NTMB) using the method of double series of microdilutions of different antimicrobials for the determination of minimal inhibitory concentration (MIC) in a liquid nutrient medium using the TREK Diagnostic Systems test-system, Thermo Scientific — SLOWMYCO for slow-growing mycobacterium and RAPMYCO for fast-growing mycobacterium, nocardia and aerobic actinomycetes.

Materials and methods. Genotyping of 143 NTMB isolates was carried out by PCR hybridization on strip-strips (Hain Lifescience GenoType Mycobacterium CM/AS). DR was determined by the culture method using TREK Diagnostic Systems kits. The panel for slow-growing NTMBs made it possible to determine the MIC of 13 drugs, for fast-growing NTMBs — 15 drugs.

Determination of DR NTMB was carried out as follows: a suspension of NTMB culture grown on Levenshtein-Jensen solid nutrient medium (at a concentration of 5×10^5 CFU/ml) was inoculated into the cells of 96-cell plates in an amount of 100 μ L and incubated in a thermostat at 37 °C until growth in control wells. The results were interpreted using a bacteriological analyzer Sensititre Vizion System TREK Diagnostic Systems (USA).

Results and conclusion. The TREK Diagnostic Systems test-system allows fast determination of DR of NTMB, being the most promising for implementation into anti-tuberculosis laboratory service workflow in Ukraine. The use of PCR hybridization on strips with the subsequent determination of DR NTMB by the method of double serial microdilutions makes it possible to identify the species of NTMB and determine DR to antibacterial drugs.

Low MICs of clarithromycin, linezolid, amikacin, moxifloxacin for slow-growing NTMBs confirm efficacy of these antibiotics for the treatment of mycobacteriosis caused by this group of microorganisms. Amikacin, linezolid, moxifloxacin and ciprofloxacin are more effective for the treatment of mycobacteriosis caused by rapidly growing NTMBs.

Key words: mycobacteriosis, drug resistance, non-tuberculosis mycobacteria, minimum inhibitory concentration.

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