



Asian - African society
Of Mycobacteriology

Available at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/IJMYCO



Isoniazid resistance among rifampicin-susceptible *Mycobacterium tuberculosis* isolates from tuberculosis patients

Jyoti Arora^{a,*}, Ritu Singhal^a, Ajoy Kumar Verma^a, Gavish Kumar^a, Manpreet Bhalla^a, Rohit Sarin^b, Vithal Prasad Myneedu^a

^aDepartment of Microbiology, National Institute of Tuberculosis and Respiratory Diseases, New Delhi, India

^bDepartment of TB and Chest, National Institute of Tuberculosis and Respiratory Diseases, New Delhi, India

ARTICLE INFO

Article history:

Received 26 September 2016

Accepted 1 October 2016

Available online xxxx

Keywords:

Isoniazid resistance

Rifampicin

Susceptible isolates

Tuberculosis patients

ABSTRACT

Objective/Background: With the introduction of novel molecular techniques that rely on rifampicin (RIF) susceptibility, resistance to isoniazid (INH) or other first-line drugs remains undetected. Such patients are prescribed first-line antituberculosis therapy and are on RIF monodrug therapy during the continuation phase, which may lead to therapeutic failure and emergence of multidrug resistance. We aimed to study INH resistance among RIF-susceptible *Mycobacterium tuberculosis* (MTB) isolates from retreatment patients.

Methods: The Drug Susceptibility Testing data for four first-line drugs (streptomycin [SM], INH, RIF, and ethambutol [EMB]) using BACTEC MGIT 960 (Becton Dickinson, Franklin Lakes, NJ, USA) and for two drugs (INH and RIF) using line probe assay was analyzed retrospectively at the Department of Microbiology, National Institute of Tuberculosis and Respiratory Diseases (New Delhi, India).

Results: We analyzed 4910 drug susceptibility results performed using the BACTEC MGIT960 liquid culture system from 2009 to 2015. We found that 969 (19.7%) isolates were sensitive to all four first-line drugs, 3941 (80.3%) isolates were resistant to one or more drugs, and 3041 (61.9%) isolates were resistant to both RIF and INH with or without resistance to any other drug (multidrug resistant). Monodrug resistance to SM and EMB was observed in 94 (1.9%) and 8 (0.16%) isolates, respectively. RIF resistance without INH resistance was observed in 22 (0.44%) isolates. There were 776 isolates sensitive to RIF, but resistant to INH. Among these, INH resistance with EMB and/or SM was observed in 367 (7.47%) isolates, whereas 409 (8.3%) isolates were resistant to INH alone. The results of line probe assay from 2012 to 2015 were also analyzed, and the resistance to INH alone among all isolates with valid results was found to be 9.32% (1462/15,676). More than 75% of these isolates harbor mutations in the *kat G* gene associated with high-level resistance.

* Corresponding author.

E-mail address: aroraj5@hotmail.com (J. Arora).

Peer review under responsibility of Asian African Society for Mycobacteriology.

<http://dx.doi.org/10.1016/j.ijmyco.2016.10.007>

Conclusion: INH resistance among RIF-susceptible isolates was present in 10–15% of the total cases. Among these cases, the use of RIF susceptibility alone will fail to detect INH resistance. Since higher rates of failure, relapse, or acquired resistance are linked with INH resistance, rollout of techniques focusing on RIF resistance must, therefore, be accompanied by strict monitoring for better management of patients.

Conflicts of interest

The authors have no conflicts of interest to declare.