

Original Article

TRANSMISSION DYNAMICS OF *MYCOBACTERIUM TUBERCULOSIS*
BETWEEN FOREIGN-NATIONALS AND JAPANESE TUBERCULOSIS PATIENTS
LIVING IN SHINJUKU-CITY, TOKYO, JAPAN

¹Yoshiro MURASE, ²Akihiro OHKADO, ³Yuu WATANABE, ³Sumi KAGURAOKA,
³Keiko ISHIHARA, ³Chiaki HOMAREDA, ²Kazuhiro UCHIMURA, ⁴Shinji MAEDA,
¹Takemasa TAKII, and ⁵Nobukatsu ISHIKAWA

Abstract [Setting] Shinjuku-city, Tokyo, Japan, where the proportion of foreign-nationals among total tuberculosis patients is relatively high.

[Objective] To evaluate transmission dynamics of *Mycobacterium tuberculosis* between foreign-nationals and Japanese tuberculosis patients living in Shinjuku-city, Tokyo, for improvement of tuberculosis control in metropolitan cities in Japan.

[Subject] A total of 907 *M.tuberculosis* strains including 85 from foreign-nationals and 822 from Japanese patients from 2002 to 2011.

[Methods] IS6110-RFLP and spoligotyping were applied for *M.tuberculosis* strains. Genotypic data as well as epidemiological data obtained from routine epidemiological survey performed by public health center were used for estimation of tuberculosis transmission.

[Results] Most of the foreign-national tuberculosis patients originally come from high TB prevalence countries including South Korea (n=35), China (n=17), Myanmar (n=11). We found significant lower clustering rate among foreign-nationals than Japanese (16% vs. 51%, $P < 0.001$). 71 strains of foreign-nationals were genotyped as unique, which implied development of TB from latent TB infection (LTBI) acquired at their countries. The remaining 14 strains belonged to 13 mix clusters including both foreign-nationals and Japanese. Based

on clustering analysis, 2 patients were considered as index cases of the mix clusters, while 12 patients were considered as secondary cases of the mix clusters.

[Conclusion] Most of the foreign-national tuberculosis patients (71/85) were considered to develop disease due to reactivation of LTBI which they got infection before immigration to Japan, while the remaining patients (14/85) developed disease possibly due to recent infection after immigration to Japan. *M.tuberculosis* transmission from foreign-nationals to Japanese people is limited.

Key words: TB among foreign nationals, Molecular epidemiology, IS6110-RFLP, Spoligotyping, Shinjuku-city

¹Departments of Mycobacterium Reference and Research, and ²Epidemiology and Clinical Research, Research Institute of Tuberculosis, Japan Anti-Tuberculosis Association (JATA), ³Shinjuku Public Health Center, ⁴School of Pharmacy, Hokkaido Pharmaceutical University, ⁵Research Institute of Tuberculosis, JATA

Correspondence to: Yoshiro Murase, Department of Mycobacterium Reference and Research, Research Institute of Tuberculosis, JATA, 3-1-24, Matsuyama, Kiyose-shi, Tokyo 204-8533 Japan. (E-mail: ymurase@jata.or.jp)

Original Article

ANTITUBERCULOSIS DRUG-SENSITIVITY ANALYSIS OF
MYCOBACTERIUM AVIUM COMPLEX ISOLATED FROM SPUTUM SAMPLES
OF PATIENTS WITH NON-TUBERCULOUS MYCOBACTERIOSIS AND
THAT FROM NATURAL ENVIRONMENTS

¹Yuta MORISHIGE, ²Toshio YAMAZAKI, and ¹Fumio AMANO

Abstract [Purpose] We analyzed sensitivities of isoniazid (INH), rifampicin (RFP) and ethambutol (EB) against *Mycobacterium avium* complex (MAC) isolated from sputum samples of patients with Non-tuberculous mycobacteriosis and that from natural environments, in order to reveal the different drug-resistance between clinical and environmental isolates.

[Methods] Minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) of the both isolates against INH, RFP and EB were examined by broth microdilution method.

[Results & Discussion] INH showed very high MIC and MBC on the both clinical and environmental isolates without any significant differences. The result suggests that INH has bactericidal effect toward MAC isolates, though it has low efficacy toward them. On the other hand, RFP and EB showed lower MIC and MBC than INH. The environmental isolates showed slightly lower susceptibility than the clinical isolates.

Interestingly, both RFP and EB showed considerably large differences between MIC and MBC, especially against the clinical isolates. These results suggest that not only EB but also RFP, which is known as a bactericidal drug, have bacteriostatic effect toward MAC at low concentration.

Key words: Non-tuberculous mycobacterium, Antitubercular susceptibility, MIC, MBC

¹Laboratory of Biodefense and Regulation, Osaka University of Pharmaceutical Sciences, ²Division of Biosafety Control and Research, National Institute of Infectious Diseases

Correspondence to: Fumio Amano, Laboratory of Biodefense and Regulation, Osaka University of Pharmaceutical Sciences, 4-20-1 Nasahara, Takatsuki-shi, Osaka 569-1094 Japan.
(E-mail: amano@gly.oups.ac.jp)