Avian tuberculosis in flocks of pigeons and its potential impact on tuberculination of cattle

M. Bolfion a, N. Mosavari b, *, M. Salehi c, K. Tadayon b

a Department of Petroleum Microbiology, Research Institute of Applied Science, ACECR, Velenjak, Shahid Beheshti University, Tehran, Iran
b Tuberculosis Department, Razi Vaccine & Serum Research Institute, Karaj, Iran
c North Tehran Branch, Islamic Azad University, Tehran, Iran

ABSTRACT

Aims and objectives: The Mycobacterium avium subsp avium (MAA) is a slow-growing, frequently-encountered mycobacterium in the environment that causes tuberculosis mainly in birds and sometimes in farm animals. As a favorite pet bird, the pigeon is extensively kept for homing and/or racing purposes in Iran, therefore, the main objective of this study was to investigate dissemination of M. avium subsp avium (MAA) in pigeon aviaries in Tabriz, North-western Iran.

Methods: From a total of 140 birds collected from private flocks (n = 3), The pathologically changed lungs and the lymph node were examined histologically by staining with Ziehl–Neelsen (Z–N) and hematoxylin–eosin; 39 were subjected to bacterial culture, out of which 34 mycobacterial isolates were recovered. Mycobacterial DNA was isolated according to the previously described method (Van Soolingen et al., 1993). Applying a five-PCR diagnostic algorithm targeting short, but definitive stretches of 16S rRNA and RV0577 genes, IS6110, IS901 and IS1245 genomic loci, all the isolates were identified as MAA. PvuII-IS901 RFLP typing was also performed on all isolates.

Results: They were either IS901+/IS1245+ (n = 22) or IS901+/IS1245 (n = 12). In IS901-RFLP strain typing of a subset of the isolates (n = 22), they were classified into five distinct multi-banded but similar patterns, namely PA (n = 13), PB (n = 5), PC (n = 2), PD (n = 1) and PE (n = 1). No correlation between IS901-RFLP genotype and presence/lack of IS1245 was noted as isolates both holding and lacking IS1245 were found to share PA and PB genotypes. Whilst no case of mixed infection with more than one strain was detected in any single bird, it was not possible to extend this observation to the aviary level as original colonies of birds were not recorded. When four healthy cattle sensitized against Mycobacterium bovis AN5 and M. avium D4 were tuberculinated, the results confirmed the observed skin reactions against bovine tuberculin in animals sensitized with M. avium were large enough to complicate test interpretation.

Conclusions: It is believed that the extent of such epidemiological impact deserves further investigation if progress in the control of bovine tuberculosis is intended. This indicates the importance of identification of the causative agent before any conclusions are made, based solely upon the results of the skin test and histopathological examination.

© 2014 Asian-African Society for Mycobacteriology. Published by Elsevier Ltd. All rights reserved.

* Corresponding author.

http://dx.doi.org/10.1016/j.ijmyco.2014.09.008