Comparison of PCR and designed ELISA methods to detect avian tuberculosis in suspected pigeons

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Abstract

Avian tuberculosis is a chronic disease that generally affects the bird's gastrointestinal tract and it often results in bird death. *Mycobacterium avium* subsp. avium is the most important cause of disease in birds. From October 2018 to October 2019, one hundred one suspected pigeons were selected based on clinical signs and poor physical condition. For ELISA system design, a blood sample was collected via pigeon wing vein and serum was collected. For the PCR method, pigeons were euthanized and post mortem were performed, and samples from liver and spleen and each organ with gross lesions were collected and stored in a freezer at -40 °C. *Mycobacterium avium* subsp. avium strain D4 antigen in Microbial Bank of Vaccine Research Institute was used in the design of the ELISA system. 16S rRNA, IS901 and IS1245 primers were used for molecular testing. The results showed that 39 out of 101 suspected pigeons were positive for the IS901 and IS1245 genomic sequences in PCR. But, only 13 cases out of 101 pigeons, were positive by the designed ELISA system. These 13 cases also were positive in the PCR test. Correlation between PCR and designed ELISA methods results was significant (0.485). Clinical sensitivity and specificity of the PCR method were 100% and the sensitivity and specificity of the ELISA method were 33.33% and 100%, respectively. It was concluded that the rate of avian tuberculosis among pigeon flocks in Ahvaz is relatively high and prevention and control plans should be applied by pigeon keeper and veterinary organization. The sensitivity of PCR to detect avian tuberculosis is higher than the designed ELISA system and ELISA test could be used for primary screening pigeon flocks in the early stages of avian tuberculosis.

Keywords: Avian Tuberculosis, Mycobacterium, PCR, Designed, ELISA

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