University of Zabol
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The Thesis Submitted for the Degree of DVM

Survey of prevalence of tet(A) and class 1 Integron genes in tetracycline-resistant Escherichia coli isolated from lesions of colibacillosis

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Abstract

Antibiotics have been the first line of defense against *Escherichia coli* infection, but they have lost their potency as the bacteria become dramatically resistant to treatment. The aim of this study was to evaluate the resistance to tetracyclines and the prevalence of *tetA* and *class I integron* resistance genes in isolated *E. coli* from broilers with colibacillosis. A swab sample taken from the lesions of internal organs from 100 broiler chickens that suspected of colibacillosis after the postmortem examination, then placed in 5 ml of TSB medium and transferred them to the laboratory of Zabol University School of Veterinary Medicine. Samples were cultured on the incubated TSB medium and MacConkey Agar and EMB medium, after that, bacterial colonies were identified by using biochemical reactions. The method to study the resistance of bacterial samples against Tetracycline antibiotic, used the disk diffusion method on Müller-Hinton agar medium with two antibiotic disks including doxycycline and tetracycline . After 24 hours of incubation at 37 ° C, the diameter of the inhibition zone was measured and the results were interpreted according to the Clinical and Laboratory Standards Institute Guideline (CLSI). 58 isolates of Escherichia coli resistant to one or both antibiotics were used in this sudy. We used boiling method to extract their DNA for studding *tetA* and *class 1 integron* genes performed polymerase chain reaction (PCR) by using specific primers. In this research, 96.6% of isolated *E.coli* samples were resistant to one or both of used antibiotics. The results showed that, 98.2% of tetracycline-resistant *Escherichia coli* bacteria that isolated from lesions of colibacillosis carry *tetA*. The prevalence of *class I integron* gene was 98.2%. Also, 96.5% of the isolates of this bacterium carried both genes. The prevalence of *tetA* and *class 1 integron* genes in this study was significantly higher than other studies, so this huge difference could indicate highly antibiotic resistance in poultry farms in this region, which is probably due to the indiscriminate use of these antibiotics to remedy poultry infectious diseases. The results of this study clearly emphasize the need of cautious use of tetracyclines in poultry farms to reduce the prevalence of *Escherichia coli* resistant to these antibiotics. However, to reduce antimicrobial resistance and more effective treatment of infectious poultry diseases, we recommend that using different classes of antibiotics and getting antibiogram test.

Keywords: Integron class Ⅰ, tet (A), Escherichia coli, Colibacillosis, tetracycline