



ASSOCIATED PROFILES OF VIRULENCE GENE MARKERS IN CLOSTRIDIUM PERFRINGENS STRAINS ISOLATED FROM HEALTHY AND DISEASED BROILER CHICKENS WITH NECROTIC ENTERITIS

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Abstract:

Clostridium perfringens induced necrotic enteritis (NE) and subclinical disease have become important threats to poultry health and is one of the main causes of losses in broiler flocks due to high mortalities and reduction in growth rate as well as enterotoxemias in domestic animals and humans. The mechanism of virulence of *C. perfringens*, a bacterium causing necrotic enteritis in birds, results largely from its ability to produce toxins. A study was set up to look the rate of carriage of *C. perfringens* among broilers with different health status, incidence rate of the different toxin genotypes of *C. perfringens* in healthy and diseased birds and, lastly, the relative abundance of *cpe*, *cpb2* and *netB* virulence genes. Broiler chickens from healthy flocks were sampled by cloacal swabs, while intestinal and liver samples of birds suffering from necrotic enteritis were analysed. A total of 47 (83.9%) isolates was obtained from 56 examined pooled samples (n=4) of broiler chickens with clinical problems and 14 (51.85%) isolates were obtained from 27 pooled samples (n=4) from broiler chickens without clinical problems. Seroneutralization with mice or guinea pigs has been used to type each toxin, but this conventional method has some disadvantages. Therefore, we used a multiplex PCR (m-PCR) assay with primers amplifying fragments of alpha (*cpa*), beta (*cpb*), epsilon (*etx*), iota (*iap*), for genotyping of isolated *C. perfringens* strains. All 61 broiler chicken *C. perfringens* isolates were shown to carry the *cpa* gene but not *cpb*, *etx* and *iA* genes, signifying that all isolates represented type A. For the first time the associated profiles of the following virulence genes [*cpe*, *cpb2* (beta-2 toxin) and the newly described pore forming toxin gene (*netB*)] were determined among Egyptian isolated *C. perfringens* strains. None of the isolates contained the enterotoxin gene that may indicate the enterotoxin of *C. perfringens* does not play important role in the occurrence of Necrotic enteritis in broiler chickens. *netB* was almost always found in outbreak isolates, suggesting a positive correlation of *netB* toxin gene with the diseased status that may explain its role in the pathogenesis of the disease. Whereas *cpb2* was found in healthy and diseased bird isolates that suggest there is a weak or no relationship between beta2 toxin and necrotic enteritis in birds. So this study throw novel insights into the presence and distribution of *C. perfringens* types as well as virulence-associated genes in field strains, which will help us to understand the pathogenesis of disease in poultry and more comprehensively characterize *C. perfringens* in future studies to put a suitable strategy for prevention and control.

Keywords:

Clostridium perfringens, broiler chickens, virulence and m-PCR

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