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Prevalence of Clostridium perfringens β2-Toxin in Type a Isolates of Sheep and Goats

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Abstract : Introduction: Clostridium perfringens is an important pathogen responsible for causing enteric diseases in both human and animals. The bacteria produce several toxins. These toxins play vital role in the pathogenesis of various fatal enteric diseases and are classified into five types, on the basis of the differential production of Alpha, Beta, Epsilon and Iota toxins. In addition to the so-called major toxins, there are other toxins like beta2 toxin, produced by some strains of C. perfringens which may play a role in the pathogenesis of disease. Aim of the study: In this study a multiplex PCR assay was developed and used for detection of cpb2 gene to identify the Beta2 harboring isolates among different types of C. perfringens. Objectives: The primary objective of this study was to identify the prevalence of β2-toxin gene in local isolates of Clostridium perfringens. Methodology: This was an experimental study. Random sampling technique was used. A total of 97 sheep and goats were included in this study. All were Pakistani local breeds. The samples were collected during the period from Sep, 2014 to Mar, 2015 from selected districts of Punjab province (Pakistan). Faecal samples were cultured in cooked meat media. The identification of Clostridium perfringens was made on the basis of biochemical tests. Multiplex PCR was performed to identify the toxin genes. Results: A total of 43 C. perfringens isolates were genotyped using multiplex PCR assay. The gene encoding C. perfringens β2-toxin (cpb2) was present in more than 50% of the isolates genotyped. However, the prevalence of this gene varied between sheep and goat isolates. Conclusion: The present study suggests the high occurrence of C. perfringens b2-toxin (cpb2) in the local isolates of Pakistan. As β2-toxin is present in both healthy and diseased animals, so further studies are suggested to establish the role of β2-toxin in pathogenesis of the clostridial enteric diseases.

Keywords : beta 2 toxin gene, clostridium perfringens, enteric diseases, goats, multiplex PCR, sheep
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