

Clinico-pathological responses of calves associated with infection of *Pasteurella multocida* type B and the bacterial lipopolysaccharide and outer membrane protein immunogens

ABSTRACT

The current study aims to investigate the Clinico-pathological responses of calves associated with the infections of *Pasteurella multocida* type B and the bacterial lipopolysaccharide and outer membrane protein immunogens. Alterations in the behavior of animals and pathological lesions observed following innate or experimental infections usually divulge extensive and detrimental changes in the clinical signs, organs and tissues of the animals afflicted with the disease. These alterations are imperative for Veterinary evaluation of herd health. Eight clinically healthy, non-pregnant and non-lactating Brangus cross heifers weighing 150 ± 50 kg were used in the study. The heifers ($n = 8$) were divided into 4 groups of 2 calves per group. The control calves in group 1 were inoculated intramuscularly with 10 mL of sterile Phosphate Buffered Saline (PBS). Calves in group 2 were inoculated intramuscularly with 10 mL of 10^{12} colony forming unit (cfu) of wild-type *P. multocida* and calves in group 3 were inoculated intravenously with 10 mL of LPS broth extract. Calves in group 4 were inoculated intramuscularly with 10 mL of OMP broth extract. All animals were observed for 48 h for clinical signs, changes in behavior and mortality pattern, including the time of death. The results divulged significant differences in the Clinico-pathological alterations. Calves inoculated with whole cell *P. multocida* type B: 2 showed a significant ($p < 0.05$) increased in rectal temperature. The affected calves showed significant severe dullness ($p < 0.000$) and significant rumen hypomotility ($p < 0.000$) was also exhibited. The calves showed signs of hypersalivation at 14 h. There is no significant difference ($p = 0.240$) in pulmonary oedema in the Calves of group 2 compared to control group 1. Calves of group 4 also showed no significant difference in pulmonary oedema ($p = 0.612$) compared to control group 1. Calves of group 3 showed significantly moderate pulmonary oedema ($p < 0.000$). All the three treatment groups showed significant ($p < 0.05$) differences in the presence of inflammatory cells in the lung. All the three treatment groups showed significant ($p < 0.05$) in the presence of degeneration and necrosis of cells in the lung. Calves of group 2 showed significantly severe haemorrhage ($p < 0.000$) in the lung including groups 3 and 4 ($p < 0.000$) respectively. Calves in group 2 showed significantly ($p < 0.000$) mild thrombus formation. There is no significant thrombus formation in the lung of calves in groups 3 ($p = 0.352$) and 4 ($p = 0.184$) respectively. In conclusion, the pathophysiological changes in cattle will assist in the improvement of the vaccines and the vaccination methods that are currently employed in controlling this important disease in Malaysia.

Keyword: Bacterial lipopolysaccharide; Calves; Clinico-pathological; Outer membrane protein immunogens; *Pasteurella multocida* type B