PREDICTION OF THE IMMUNOGENIC PROPERTIES OF THE VP2 PROTEIN FROM DIFFERENT VARIANTS OF CANINE PARVOVIRUS.

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Canine parvovirus is the most common agent that affects young dogs, causing gastrointestinal signs. It is known that mutations in the VP2 protein of the capsid are responsible for the pathogenicity and interaction with the host cell. The emergence of new mutations can lead to vaccine failures and disease in vaccinated animals. The objective of this study was to perform a computational simulation of the canine immune system in order to evaluate the immune response against different strains of CPV-2. For this purpose, sequences of the VP2 protein from CPV-2a, CPV-2b, CPV-2c, and a commercial vaccine were used, along with 108 Brazilian CPV-2 sequences from the last 10 years, from which a consensus sequence was generated. Each sequence was linked to an adjuvant in the C-terminal region. Antigenicity was evaluated using Vaxijen, and the prediction of the immune system response was performed using C-ImmSim. The commercial vaccine had an antigenicity score of 0.5051, the lowest result. CPV-2a and the consensus sequence had the highest values (0.5079). The immunological simulation revealed a mild initial response after the first simulation of the tested VP2 applications, with an increase in IgM and IgG1+IgG2 antibodies, IgM and IgG+IgM in the subsequent simulations. The most significant increase occurred in the third simulation. There was a significant increase in memory B cells in the second simulation, peaking in the third. After 120 days from the third simulation, there was a decrease in the population of B cells in all tested VP2. The expression of memory cells increased after the application simulation of all VP2, suggesting robust activation of the secondary immune response. The highest production of memory B cells was observed with CPV-2a and the consensus VP2. The CPV-2a variants and the consensus VP2 stood out in memory TH cells. In the CPV-2b, CPV-2c, and commercial vaccine variants, the highest levels were achieved after the third simulation. The variants also stimulated the production of cytokines in a varied manner. It can be concluded that the VP2 protein from different strains of parvovirus is a promising protective antigen for the development of subunit vaccines against CPV-2.

Palavras-chave: canine parvovirus; capsid protein; immunogenicity.

Apoio: UCS, CNPq