Comparison of the Th1-mediated immunity induced by two anti-Leishmaniosis vaccines in dogs

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Abstract (300 word limit)

Statement of the Problem: The protective immune response to canine leishmaniasis is mainly cell-mediated. Two European vaccines are commercialized to prevent the development of an active Leishmania infection in dogs. The study aimed to compare the cell-mediated orientation of the immune system induced by each vaccine. Methodology & Theoretical Orientation: Twenty-four Leishmania seronegative 6-months-old Beagle dogs were randomly vaccinated with 3 injections of a LiESP/QA-21 vaccine (CaniLeish™, Virbac, n=8) at D0, D21, D42, or vaccinated with 1 injection of the Q-protein recombinant vaccine (LetiFend™, Leti, n=8) at D42, or received one injection of PBS (negative control) at D42 (n=8). Blood samples were taken at D0, D40, and D69 to assess the canine macrophage leishmanicidal activity (CMLA): (index of parasitemia, Nitric Oxide derivates production, M1/M2 macrophages ratio), key markers correlated with the Th1-profile of the immune response (cysteine/cystine ratio) and the peripheral effective memory T-cells (TEM) presence. Skin biopsies were performed at the study end to assess the resident effective memory T-cell response (TREM). Findings: A CMLA response was observed in 4/8 (50%) and 3/8 (40%) dogs after respectively the second and first injections of CaniLeish™ and LetiFend™ vaccines (data not shown). However, a mature cell-mediated immune response against canine leishmaniosis (CMLA + activated TEM + activated TREM + cysteine/cystine ratio) after the primary vaccination courses was observed for 8/8 (100%) dogs vaccinated with CaniLeish™ but 1/8 (13%) dog vaccinated with LetiFend™ (Fig1). Conclusion & Significance: In this study, only CaniLeish™ vaccine elicited a mature cell-mediated immune response against canine leishmaniosis in all vaccinated dogs. In case of Leishmania infection, the presence of activated memory T-cells, especially at skin level, might induce an earlier specific re-activation of the immune system in dogs vaccinated with CaniLeish™ versus LetiFend™. Further investigations are required to confirm these findings and their implications in field conditions.

Image

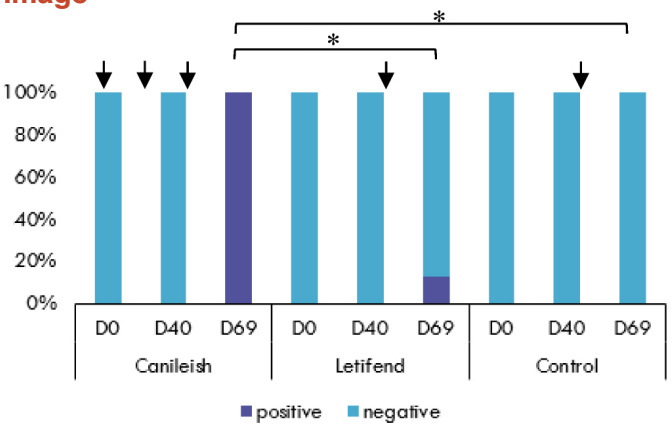

Fig 1: proportion of dogs presenting a mature cell-mediated immune response against canine leishmaniosis (CMLA + activated TEM + activated TREM + cysteine/cystine ratio). N=8 dogs in each group at each time point. Arrows represent the time when the vaccine or placebo injections were performed. * : $p<0.05$

Recent Publications (minimum 5)

1. De Mari et al (2017) Comparative delayed-type hypersensitivity (DTH) activity of two vaccines against canine leishmaniasis: CaniLeish® (LiESP/QA-21) and LetiFend® (protein Q recombinant vaccine) in mice. J Infect Dis Ther 5(7 Suppl):45.
2. Glennie et al (2017) Skin-resident CD4+ T cells protect against *Leishmania major* by recruiting and activating inflammatory monocytes. PLoS Pathog 13(4):e1006349.
3. Moreno et al (2014) Primary vaccination with the LiESP/QA-21 vaccine (CaniLeish) produces a cell-mediated immune response which is still present 1 year later. Vet Immunol Immunopathol 158(3-4):199-207.
4. Reis AB et al (2010) Immunity to Leishmania and the rational search for vaccines against canine leishmaniasis. Trends Parasitol 26(7):341-9.
5. Rodrigues Reina Moreira et al (2017) Polarized M2 macrophages in dogs with visceral leishmaniasis. Vet Parasitol 226:69-73.

Biography (150 word limit)

Christelle Fontaine is Medical Manager – Companion animals – Virbac. She is involved in phase IV trials and collaboration with Universities and specialists across the World. She graduated from the French Veterinary School of Maison Alfort, in Paris in 2007.

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Notes/Comments