

Effect of Methylprednisolone Sodium Succinate on Function and Number of Canine Peripheral Blood Phagocytes

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Glucocorticoids (GCs) are the most widely used immunosuppressive agents. However, animals treated with GCs experience deleterious side effects which limit their use in many clinical conditions. In the present study, we examined whether methylprednisolone sodium succinate (MPSS), a glucocorticoid, modulates phagocytic capacity, oxidative burst activity (OBA) and circulating number of canine peripheral blood phagocytes, and whether tumor necrosis factor- α (TNF- α) production from canine peripheral blood phagocytes is affected by MPSS infusion. The design of the experimental protocol involved the application of a high dose of MPSS, which is the recommended protocol for patients with acute spinal cord injury. Blood samples were collected by jugular venipuncture before and after dosing, successively. Complete blood counts were performed by an automated counter. The amount of canine TNF- α was quantified by a direct sandwich ELISA. To evaluate the phagocytic capacity and OBA of peripheral blood phagocytes, peripheral blood mononuclear cells (PBMCs) and polymorphonuclear cells (PMNs) were isolated by density gradient centrifugation, respectively. The phagocytic capacity and OBA were measured simultaneously by a flow cytometry. The intravenous infusion of MPSS decreased the phagocytic capacity and OBA of canine PMNs but not PBMCs. The phagocytic capacity and OBA suppressed by MPSS were recovered 12 hours after the completion of MPSS dosing. The lipopolysaccharide-induced TNF- α production by PBMCs exposed to MPSS was reduced 12 hours after the completion of MPSS dosing. Neutrophilia and monocytosis were induced by MPSS infusion and then they were also recovered 48 hours after the completion of MPSS dosing. These results suggest that the application of MPSS protocol inhibits the innate immune functions of canine peripheral blood phagocytes for short time relatively, and that it modulates the circulating number of canine peripheral blood phagocytes.

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