

Evaluation of the influence of meloxicam and flunixin meglumine on the apoptosis of peripheral blood CD4⁺ and CD8⁺ T cells in calves

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Abstract

The aim of the study was to determine whether treatment with recommended doses of meloxicam or flunixin had an effect on the apoptosis of peripheral blood T lymphocytes in calves. The study was carried out on 4-5 months old calves (n = 24, 8 per group). Experimental animals were injected subcutaneously with a single dose of 0.5 mg · kg⁻¹ of meloxicam or intravenously with 3 doses of 2.2 mg · kg⁻¹ day⁻¹ of flunixin. The non-treatment animals served as control. Blood samples were taken at day 0 and at days 1, 2, 3, 5, 7 and 14 after the first NSAIDs injection. Apoptosis was determined by flow cytometry using Annexin V-PE/7-AAD staining. The kinetic analysis of apoptosis in the total lymphocyte population, as well as in the CD4⁺ and CD8⁺ subsets did not reveal significant differences in the frequency of early apoptotic cells between control and experimental groups throughout the period studied. Although, 24 h after administration of the first dose of NSAIDs, late-stage apoptosis/necrosis was significantly increased in the total lymphocyte population (the meloxicam group), as well as in the CD4⁺ (the meloxicam group and the flunixin group) and CD8⁺ (the flunixin group) subsets of T cells. However, this disturbance was transient, relatively poorly expressed and, thus, unlikely to be of clinical significance. Our results indicate that the use of meloxicam or flunixin in accordance with the recommended dosage regimen in cattle do not have a clinically significant influence on apoptosis of peripheral blood T cells.

Key words: meloxicam, flunixin, apoptosis, lymphocytes, CD4⁺, CD8⁺, calves