Dexamethasone, but not meloxicam, suppresses proliferation of bovine CD25⁺CD4⁺ and CD25⁻CD4⁺ T cells

T. Maślanka, J.J. Jaroszewski

Abstract

Recently, we found that dexamethasone caused a depletion of CD25⁻CD4⁺ T cells, but it increased the number of CD25ʰᵒʰCD4⁺ and CD25ʰˡˡCD4⁺ T cells. We also determined meloxicam-induced increase in the number of CD25ʰᵒʰCD4⁺ T cells. In view of this, and taking into consideration the latest reports indicating that meloxicam shows an anti-proliferative effect on bovine peripheral blood mononuclear cells, it was considered purposeful to determine the effect of both drugs on proliferation of bovine CD25ʰᵒʰCD4⁺, CD25ʰˡˡCD4⁺ and CD25⁻CD4⁺ T cells. Flow cytometry analysis and 5-bromo-2'-deoxyuridine incorporation assay were applied to detect the cell proliferation. It was demonstrated that dexamethasone, but not meloxicam, significantly reduced cell proliferation within all three evaluated CD4⁺ T cell subpopulations. Thus, the depletion of CD25⁻CD4⁺ T cells by treatment with dexamethasone can partly be the effect of the anti-proliferative action of the drug, however, dexamethasone-induced increase in the number of CD25ʰᵒʰCD4⁺ and CD25ʰˡˡCD4⁺ T cells cannot be the result of enhanced proliferation of these cells.

Key words: cattle, CD4⁺ cells, dexamethasone, meloxicam, proliferation

Introduction

Recently, we investigated the in vitro effect of dexamethasone on bovine CD25ʰᵒʰCD4⁺, CD25ʰˡˡCD4⁺ and CD25⁻CD4⁺ T cells (Maślanka and Jaroszewski 2012). It was found that dexamethasone caused considerable loss of CD25⁻CD4⁺ T cells, but it increased the relative and absolute numbers of CD25ʰᵒʰCD4⁺ and CD25ʰˡˡCD4⁺ T lymphocytes. It has been demonstrated that changes in cell number were at least partly caused by the pro-apoptotic effect of the drug on CD25⁻CD4⁺ T cells and the anti-apoptotic effect on CD25ʰᵒʰCD4⁺ and CD25ʰˡˡCD4⁺ T cells. However, it should be taken into consideration that the above-mentioned changes in the number of bovine CD4⁺ T lymphocytes could be additionally connected with the effect of the drug on the proliferation of these cells. Therefore, the main aim of this study was to establish the effect of dexamethasone on proliferation of bovine CD25ʰᵒʰCD4⁺, CD25ʰˡˡCD4⁺ and