The effect of metamizole and tolfenamic acid on canine and equine adipose-derived mesenchymal stem cells (ASCs) an in vitro research.

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Abstract

The influences of NSAIDs (Nonsteroidal Anti-inflammatory Drugs) – non-selective metamizole and selectively-acting tolfenamic acid were estimated on morphology, ultrastructure, and cytophysiological activity of canine (Ca) and equine (Eq) adipose-derived mesenchymal stem cells (ASCs). The lowest concentration of metamizole (0.01 mg/mL) stimulated the viability and cytophysiological activity of Ca ASCs and did not affect cell morphology. Stimulated cells possessed a proper, fibroblastic shape, with large, eccentrically located nuclei. Similar effects to those observed in Ca ASCs were found in Eq cells treated with both drugs. Cells cultivated with the intermediate (0.1 mg/mL) doses of NSAIDs displayed proper cell morphology, whereas cells cultivated in intermediate dose (0.1 mg/mL) became more flattened. The highest concentrations (1 mg/mL) of both drugs resulted in a cytotoxic effect in Ca and Eq ASCs. Based on these results, we conclude that stimulation of Ca and Eq ASCs with metamizole as well as Eq ASCs with tolfenamic acid can lead to positive effects only when the lowest drug concentrations are applied. This study indicates a different cellular response of canine and equine ASCs treated with metamizole and tolfenamic acid. The obtained data might be potentially useful in the study of functionalized veterinary biomaterials.

Key words: adipose-derived mesenchymal stem cells, non-steroidal anti-inflammatory drugs, cell morphology, canine, equine

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