Cox-inhibitors do not impact anti-inflammatory IL-1ra concentrations in Autologous Protein Solution

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Purpose

Autologous Protein Solution (APS) is an autologous therapy containing high concentrations of white blood cells, platelets, and anti-inflammatory cytokines.[1] APS has been shown to improve lameness and range of motion when administered via intra-articular (IA) injection to horses with osteoarthritis (OA).[2] The Cox-inhibiting drugs phenylbutazone, flunixin meglumine, and firocoxib are administered to horses to treat the inflammation and pain associated with OA.[3,4] It was previously unknown whether Cox-inhibitor treatment prior to the time of blood draw for APS treatment would influence the IL-1ra or IL-1β concentrations in APS.

Materials & Methods

Three blood samples from each of four horses were combined with ButaJect phenylbutazone (Henry Schein Animal Health), Flunazine flunixin meglumine (Bimeda-MTC Animal Health), or Equioxx firocoxib (Merial) to reach plasma concentrations of 4.5, 10, and 0.3 μg/ml, respectively, and were incubated for 93 ± 4 minutes.[5-8] A fourth blood sample from each horse that was generated during a previous study served as a control. APS was generated from each blood sample using the Pro-Stride Injection Kit (Owl Manor Veterinary). Enzyme-linked immunosorbent assay (ELISA) analysis (R&D Systems) was used to determine cytokine concentrations. ANOVA analysis was used to evaluate statistical significance.

Results

IL-1ra concentrations were not significantly altered by incubation of blood with phenylbutazone, flunixin meglumine, or firocoxib ($p = 0.882$, $F = 0.218$, $DF = 3$, nested ANOVA analysis (Minitab software)) (**Figure 1**). IL-1β concentrations for all conditions were below the standard curve range of the assay (125 pg/ml), indicating that incubation of equine blood with Cox-inhibitors did not produce a high IL-1β concentration in APS.

Conclusion

Cox-inhibitor presence in equine blood used to produce APS did not impact the concentrations of the anti-inflammatory cytokine IL-1ra. This outcome suggests that equine treatment of OA with phenylbutazone, flunixin meglumine, or firocoxib prior to blood draw for APS production does not alter the cytokine content of APS.

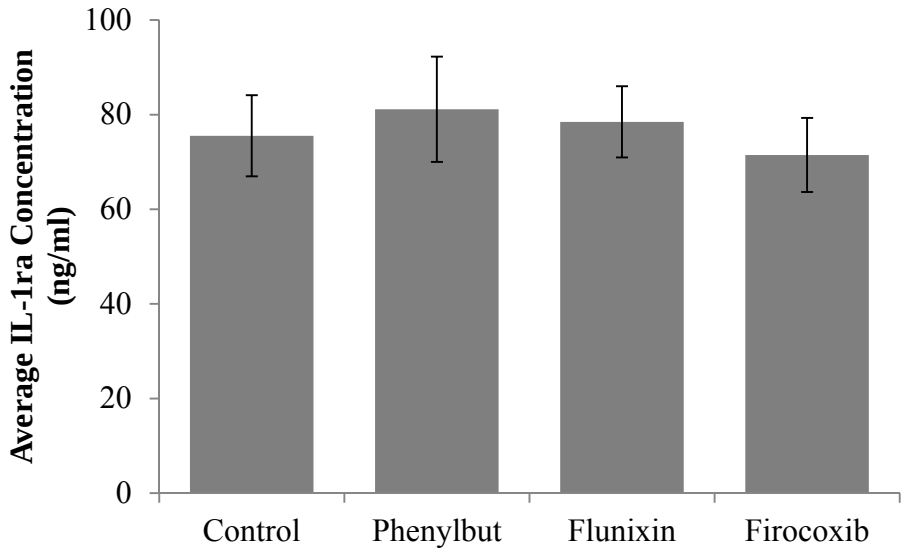

Figure 1. Average IL-1ra concentrations (ng/ml) in APS control, and APS generated from blood incubated with phenylbutazone (Phenylbut), flunixin meglumine (Flunixin), and firocoxib. Data are presented as averages ± standard error. (n=4)

Disclosures: Taylor Marohl, William King, and Jennifer Woodell-May were employees of Zimmer Biomet at the time of the study. Mike Leach was an employee of Owl Manor Veterinary at the time of study. Ryan Rothenbuhler was a consultant for Owl Manor Veterinary at the time of the study.

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