Disposition of Methylprednisolone Acetate in Plasma, Urine, and Synovial Fluid After Intra-Articular Administration to Exercised Thoroughbred Horses

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The withdrawal time for intra-articular administration of methylprednisolone acetate (MPA) before a performance depends on the specific threshold established by the racing jurisdiction. In the current study, MPA was detectable in plasma, urine, and synovial fluid for up to 13, 21, and 70 days, respectively. Authors' addresses: K.L. Maddy Equine Analytical Chemistry Laboratory, School of Veterinary Medicine, University of California, Davis, CA 95616 (Knych, Casbeer, McKemie); Willow Oak Equine, 33558 County Road 24, Woodland, CA 95695 (Harrison); e-mail: hkknych@ucdavis.edu. *Corresponding and presenting author. © 2013 AAEP.

1. Introduction
Although its use remains somewhat controversial, methylprednisolone acetate (MPA) is one of the more commonly used intra-articular corticosteroids in performance horses. The goal of the current study was to describe the disposition of MPA in plasma, urine, and synovial fluid after intra-articular administration.

2. Materials and Methods
Sixteen healthy, exercised adult Thoroughbred horses received a single intra-articular MPA administration (100 mg) into the right antebrachiocarpal joint. Blood, urine, and synovial fluid samples were collected before and at various times after drug administration. Synovial fluid was collected from the right and left antebrachiocarpal and the right and left middle carpal joints. All samples were analyzed with the use of liquid chromatography-mass spectrometry (LC-MS). Pharmacokinetic analysis was conducted with the use of non-compartmental analysis.

3. Results and Discussion
The plasma terminal elimination half-life was 1.33 ± 0.80 and 0.843 ± 0.414 days for horses that had synovial fluid collected (group 1) and those that did not (group 2), respectively. MPA was undetectable by day 6.25 ± 2.12 (group 1) and 4.81 ± 2.56 (group 2) in plasma and day 17 (group 1) and day 14 (group 2) in urine. MPA was detected in synovial fluid from all joints sampled. MPA remained above the limit of detection for up to 70 days in the joint of administration. Results from this study will aid in establishing threshold concentrations and appropriate withdrawal times for racehorses.