Response of the Equine Temporomandibular Joint to Short-Term Inflammation Compared With That of the Metacarpophalangeal Joint

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The temporomandibular joint (TMJ) and the metacarpophalangeal (fetlock) joint respond differently to inflammation. The TMJ seems to be better able to squelch acute joint inflammation compared with the fetlock joint. Authors’ addresses: Department of Large Animal Clinical Sciences (Bell, Tatarniuk, Waldner, Carmalt) and Department of Biomedical Sciences (Suri, Singh), Western College of Veterinary Medicine, 52 Campus Drive, University of Saskatchewan, Saskatoon, SK S7N 5B4, Canada; e-mail: carmalt_vet@hotmail.com. © 2010 AAEP.

1. Introduction
Disease of the temporomandibular joint is often suspected clinically when dental interventions have failed to improve the behavior or weight loss of an equine patient. Despite this, reports of non-septic initiated osteoarthritis of this joint are lacking. This study was an attempt to ascertain whether the TMJ responds to inflammation in the same way as a different load-bearing joint routinely affected by osteoarthritis.

2. Materials and Methods
Using a randomized, blinded, controlled experimental trial, seven horses of varying age, breed, and sex were challenged with intra-articular injection of lipopolysaccharide (LPS) into one randomly selected caudodorsal pouch of the temporomandibular joint (TMJ) and one forelimb fetlock joint, with the opposite joint serving as a control. Synovial samples from each treatment and control joint were collected over a 24-h period, and clinical signs of joint inflammation were noted at each time point. Concentrations of interleukin-6 (IL-6), tumor necrosis factor-α (TNF-α), transforming growth factor-β (TGF-β), and total protein were measured by immunoassay.

3. Results
There were significant differences between TMJ and fetlock-treated joints for both IL-6 and TGF-β. IL-6 concentrations were significantly elevated in challenged TMJs compared with challenged fetlock joints in all horses. TGF-β concentrations were significantly elevated in challenged fetlock joints compared with challenged TMJs in all horses. TNF-α concentrations were significantly higher in the challenged TMJs than in the challenged fetlock joints from 1 to 12 h after challenge, and total protein was higher at 6 h after challenge. All treatment joints
showed clinical signs of inflammation at 1, 6, 12, and 24 h after challenge with LPS.

4. Discussion
The inflammatory response seems to attenuate more quickly in the TMJ than in the fetlock joint, which may explain, in part, the lack of clinically appreciable osteoarthritis in the TMJ of the horse.