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TMJ Inflammation's Impact on Chewing in Horses

Over the past decade, the temporomandibular joint (TMJ) has become an area of interest for many equine clinicians. This small joint, located on each side of the jaw, is almost solely responsible for allowing mammals to open and close their mouths. Despite its obvious importance, little research has been done to determine how problems in this joint might impact a horse's health.

At the 2015 American Association of Equine Practitioners' Convention (Dec. 5-9) in Las Vegas, Travis Smyth (DVM) presented the results of a study evaluating the impact of unilateral (one-sided) TMJ inflammation on chewing performance in horses. Smyth, a surgical resident at the University of Saskatchewan's Western College of Veterinary Medicine, in Saskatoon, Canada, is specializing in equine TMJ disease as part of a master's thesis, under the supervision of James Carmalt, MA, MVEtSc, VetMB.

During the conference, Smyth explained how chewing requires the jaw to move in three dimensions--not only vertically, but also horizontally and rostro-caudally (front to back). Only by having two functioning TMJs can horses be expected to perform this complex 3-D pattern.

Smyth said he and his colleagues are trying to determine what might lead to TMJ disease in horses; possible triggers include trauma, dental disease, and age-related arthritis. Clinical signs of TMJ inflammation might include quidding (dropping clumps of partially chewed, but undigested feed material from the mouth), anorexia, headshaking, head shyness, and fighting the bit.

Currently only a few cases of equine TMJ disease have been reported in published literature, all of which focus on overt end-stage disease--cases involving jaw fracture or infection of the TMJ. Smyth suspects that less-severe cases often go undiagnosed due to their subtle clinical signs. As a result, he said, veterinarians (and horse owners) might falsely believe the condition is rare in horses, or that problems occur much less frequently in TMJs than in other joints, such as the hock or fetlock. However, Smyth stated that this is likely not the case, as research into other species suggests that inflammation in the TMJ occurs just as often as in other joints.

To help determine whether TMJ disease exists in horses, Smyth and colleagues hypothesized that the creation of transient inflammation in normal TMJs would cause changes in the jaw's 3-D pattern of movement.

In their study they employed six normal horses that showed no dental or bony abnormalities. The group used a device known as a kinematic motion tracking system to intricately map the changes in chewing patterns as each of the horses ate long-stemmed hay both before and after inducing TMJ inflammation. The team used a bacterial derived immune-stimulant known as lipopolysaccharide to create a short-term inflammation in one of each horses TMJs.

Following induction of this inflammation, all horses showed an aversion (pain behavior) by chewing on the side of the mouth opposite to the inflamed joint. Many of the horses exhibited signs typically seen with naturally occurring forms of TMJ disease, such as hot, swollen, and painful TMJs. Two horses even began quidding. Interestingly despite inflammation, all of the horses continued to eat by compensating or changing the 3-D movements of their jaw.

The team concluded that unilateral inflammation of the TMJ not only affects the way horses chew, but also likely creates a certain level of pain. While the group recognizes that the inflammation in this study was created artificially and sheds no light on the prevalence of TMJ disease in horses, it does provide evidence that horses do suffer from TMJ disease. Smyth said future studies on the effects of bilateral inflammation and age-related osteoarthritis are planned.

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