Unlocking the Science of Riding

More findings from the International Society for Equitation Science

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In my October “Horse-Health Connection” article, I summarized a number of presentations from the 2015 International Society for Equitation Science (ISES) annual conference. With its theme of “Ethical Equitation for All Equestrian Disciplines: Breaking Barriers and Building Bridges,” the conference contained so much information that I thought it warranted a follow-up article. For this issue, I’ve summarized some of the research reports that didn’t make it into the first installment.

Horse Science

Hyperflexing horses’ necks: Meta-analysis and cost-benefit evaluation

Uta König von Borstel, University of Göttingen, Germany; Kathrin Kienapfel, University of Bochum, Germany; Andrew McLean, Australian Equine Behaviour Centre; Christina Wilkins, Australia; David Evans; Paul McGreevy, University of Sydney, Australia

Hyperflexion ("rollkur") has been a controversial topic for many years, and a number of research studies have been performed in an attempt to measure its effects. The authors identified 55 scientific articles dealing with the effects of equine head and neck postures. Of those, 42 articles evaluated equine welfare, and 35 articles evaluated the effects of hyperflexion on athletic performance, including studies of locomotion, muscle activity, breathing ability, and the horse’s workload. The studies were graded according to whether the results showed that hyperflexion had a positive effect, a negative effect, or a contradictory or insignificant effect on the horse’s welfare or gymnastic ability.

A majority of the studies (88 percent) indicated that hyperflexion had a negative effect on equine welfare for a variety of reasons, including impeding the horse’s ability to breathe, causing injury to the horse’s neck, impairing the horse’s vision, and causing stress or pain. Only one study suggested positive effects on welfare. An interesting aspect was that the probability of a study reporting negative welfare effects was unrelated to the horses’ level of dressage training, their familiarity with working in a hyperflexed position, or the length of time they spent in hyperflexion.

With regard to the effects of hyperflexion on the horse’s athletic performance, 26 percent of the studies reported beneficial effects, including higher competition scores, larger ranges of motion in the joints of the back and limbs, and an increase in the amount of work performed. On the other hand, 23 percent of the studies detected undesirable gymnastic consequences, which included lower dressage scores, increased activation of the muscles under the neck, and breathing obstruction leading to reduced oxygen supply. The remaining studies (46 percent) described insignificant or contradictory effects of hyperflexion on gymnastics.

When evaluating horses’ athleticism, studies involving high-level dressage horses or horses familiar with being worked in a hyperflexed position were more likely to describe gymnastic benefits than those conducted on non-dressage horses or horses that were unfamiliar with working in hyperflexion.

The authors concluded that the gymnastic benefits presumed to result from training horses in a hyperflexed position are far outweighed by the undesirable effects on both gymnastic ability and equine welfare.

More than just horse play: The challenges equine veterinarians face with noncompliant horses and approaches to managing these behaviors

Gemma Pearson, Royal (Dick) School of Veterinary Studies, Scotland; Richard Reardon; John Keen; Natalie

NOT WORTH IT: Studies show that the drawbacks of hyperflexion outweigh any possible benefits
Waran, University of Edinburgh, UK

Research into occupational injuries in the UK has shown that working as an equine veterinarian is more dangerous than any other civilian occupation. The innate characteristics of equine behavior are frequently cited as a cause of accidents.

A web-based survey of veterinarians received 220 completed responses. Of those, 80.9 percent of practitioners had been injured by an equine patient in the previous five years; 57.7 percent believed they put themselves in a potentially dangerous situation either every day or a few times each week; and 54.5 percent said they encounter difficult patients either every day or a few times each week.

The methods of restraint used most frequently in noncompliant patients were chemical sedation, nose twitch, neck twitch, and an anti-rearing bit. Control techniques based on equine-learning theory (the processes by which horses learn) were generally considered unhelpful, or the respondent commented that he or she did not understand or had not heard of the technique. However, 61.4 percent of respondents considered positive reinforcement (rewarding good behavior) useful.

The fact that equine veterinarians frequently encounter potentially dangerous situations and have such a high risk of sustaining injuries from their patients is cause for concern. Incorporating equine-learning theory into veterinary training may reduce the risk of injury.

Rider Science

An initial investigation into breast-health issues in female equestrians

Jenny Burbage, University of Portsmouth, UK; and Lorna Cameron, Sparsholt College, UK

For female equestrians, issues such as breast pain and poor bra fit may be important concerns that have not been considered objectively. Exercise-related breast pain increases with vigorous activity and poor breast support. Because riders who are stiff, unbalanced, and in pain may have a negative effect on the training and welfare of the horse, it is important to establish the prevalence, severity, and impact of breast-health issues in female riders.

An online survey completed by 1,324 female equestrians indicated that almost 51 percent of riders were classified as being large-breasted (defined as having a cup size of D or greater). Breast pain was experienced by 40 percent of participants and increased linearly with cup size. For those who experienced breast pain, sitting trot was rated the most painful activity (58 percent), followed by vigorous-intensity riding at a canter or gallop or while jumping (39 percent); and 21 percent of riders reported that breast pain affected their performance. Only 27 percent of riders exclusively rode in a sports bra.

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Breast pain and upper-body muscle pain as a result of bra issues were found to be prevalent in female riders, especially those with larger breasts. It is not known what effect a rider’s pain and discomfort have on her interaction with the horse, but this warrants further investigation. Educational initiatives are needed to ensure that female equestrians are informed about appropriate bra fit and breast support during riding to help reduce barriers to participation and the potential negative effect on riding performance.

A preliminary comparison of rider position between a horse simulator and a live horse

Lucy Dumbell, Hartpury College, UK; Izabela Motyl; Jenni Douglas; Victoria Lewis; and Darcy Murphy, Hartpury College, UK

If a novice rider could learn to sit in a balanced position on a horse simulator, the welfare of school horses would be improved, and coaches would not have to worry about the consequences of a horse behaving badly. The aim of this study was to assess whether riding position on a trotting horse simulator was representative of trotting on a live horse in six adult riders.

Comparison of riding position in sitting trot on the simulator versus a live horse showed no differences. At rising trot, the rider leaned a little further forward on the live horse when sitting in the saddle, and the ankle joint was more open throughout the stride.

The results of this preliminary study indicate that riding position on a horse simulator is similar to that on a real horse in sitting trot, and there are only minor differences in rising trot. It was concluded that horse simulators offer a repeatable riding experience, and riding a simulator is sufficiently similar to riding a live horse to be a useful learning technique. This initial study into rider position would suggest that a simulator may be a reliable model when assessing rider position in trot, but further research is required.

Riders’ perception of the use of bitless bridles

Sabrina Ormston and Victoria Lewis, Hartpury College, UK

Some equine enthusiasts believe that equipment used to restrain the natural movement of the horse, such as bitted or bitless bridles, is likely to compromise the horse’s welfare. To some, bitless bridles seem a kinder alternative to the conventional bitted bridle.

However, studies have suggested that this is not the case and that bitless bridles apply considerable pressure, particularly on the horse’s nose. This study assessed riders’ knowledge of bitted and bitless bridles, investigated the reasons that they chose bitted or bitless bridles, and provided insight into perceptions about various bits and bitless bridles.

An Internet survey that used closed-ended questions was published or video feedback. Fourteen young riders were randomly assigned to either a control group that received verbal feedback only, or an intervention group that received both verbal and video feedback. After a 15-minute warm-up, the participants rode sitting trot around the perimeter of the arena on both reins, and their performance was recorded in a side view using a camera (used for kinematic analysis) and an iPad (used for visual feedback).

The participants received feedback on their position (verbal for the control group or verbal plus watch-
ing their video for the intervention group) and were then given 10 minutes to practice and make improvements based on the feedback they had received. They then repeated the test by riding sitting trot around the arena on both reins.

The riders’ shoulder, hip, and knee angles were measured and compared before and after the feedback and practice session. The intervention group (the video users) showed significant increases in their hip and knee angles (angles were more open) after watching their video with verbal feedback and then practicing for 10 minutes. This was interpreted as an improvement in performance.

Riders in the control group showed no improvement in position after receiving verbal feedback only and then practicing for 10 minutes. The results confirmed the value to equestrians of viewing performance videos in conjunction with receiving verbal feedback. For coaches, the use of a smartphone or tablet to show riders how they perform is likely to be more effective than verbal feedback alone. For riders who are often required to self-coach, the use of videos may be a helpful tool for identifying problems and improving technique.

Even More Science

Download the full proceedings of the 2015 ISES conference at EquitationScience.com/proceedings. The 2016 ISES conference will be held June 23-25 in Saumur, France. Learn more at ises2016saumur.com.