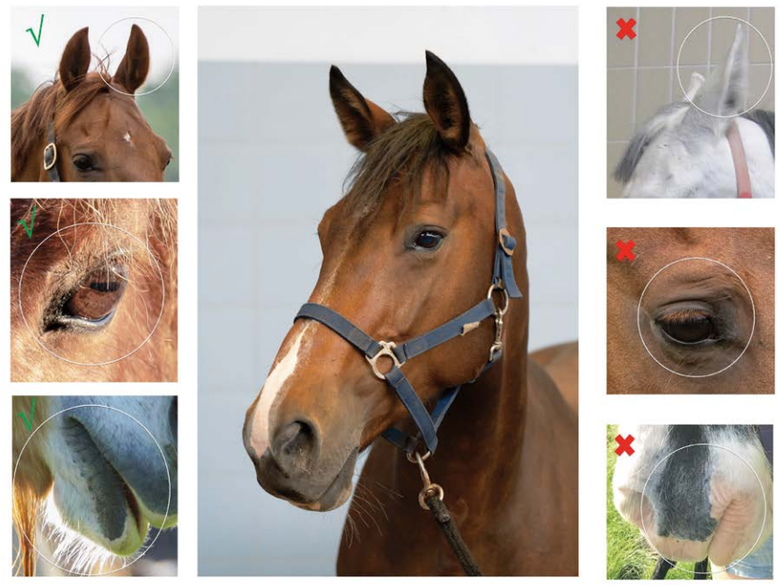
VETERINARIAN EXPLAINS

Recognising pain in horses

Pain assessment based on facial expressions



How can you recognise and measure pain in animals without being able to just ask them, like you can do in humans? This intriguing question has resulted in loads of scientific publications in the last decades, and is currently still attracting debate and interest. Wouldn't life be simple if we could just ask our horse where it hurts and how severe the pain was? But the fact that no verbal responses can be expected from our equine patients has led many researchers to think about this simple question and come up with numerous study set-ups to help find objective ways to measure pain in horses. Pain in animals has already been defined by Molony in 1997: "Pain in animals is an aversive, sensory experience representing awareness by the animal of damage or threat to the integrity of its tissues". This definition may seem difficult, but it comes down to the fact that pain changes the animal's physiology and behaviour to reduce or avoid the damage, to reduce the likelihood of its recurrence and to promote recovery. From this definition, we can learn that acute pain has a very important function. Acute pain is often caused by trauma or can be seen after surgery. Furthermore, horses experience acute visceral pain when presented with acute colic. These examples already show that pain can also be classified according to the location of the pain: we therefore can distinguish somatic, visceral and also neurogenic pain, with the location of the pain respectively in the joints and muscles of the animal, in the internal organs or in the nervous system. When not treated effectively, acute pain can develop into chronic pain with various changes in the central nervous system that sometimes make effective treatment more difficult. We use the term chronic pain for situations where the pain is persisting for over three months. At this stage, pain has lost its protective effects and may become a disease or syndrome itself.

Behavioural responses

Humans, but also animals, will show that they are in pain by behavioural responses. One objective way of assessing the amount of pain can therefore be to evaluate their behaviour. Since horses are prey animals that often try to hide their pain from possible predators, assessment of these behavioural changes can be very challenging. Because every individual animal may react differently and because pain is a subjective experience influenced by personality and experience in horses as well, it is impossible to assess the amount of pain from only one individual sign or symptom. The use of composite and facial expression-based pain scales uses behavioural changes and facial expressions to quantify the amount of pain horses are experiencing as much as possible. In the last decades, a lot of research has been performed to design and validate different pain scales for horses experiencing both acute and chronic pain. Many of these studies have also been discussed in equine magazines and you may have read about these.

Different types of pain

Composite pain scales have been described and investigated for horses experiencing different types of acute pain (orthopaedic, acute colic and post-operative pain). In all these different studies, a wide range of behavioural expressions has been scored on a scoring sheet. In most of these studies, physiological parameters like heart and breathing frequency, rectal temperature

and abdominal sounds are also taken into account. Finally, the response of the horse to a person entering the room or to palpation of the potentially painful area is also taken into account. Behavioural expressions that have been assessed range from changes in body position during rest, unloading of a certain potentially painful limb, looking to the flank, abnormal tail and head movements, teeth grinding, decreased interest in other animals etc. The individual scores for these different parameters are summed, leading to a total composite score. In many of these studies, inter-observer agreement (that shows the agreement between two or more independent observers) showed good repeatability. Discrimination between healthy pain free animals and horses experiencing different types of acute pain was overall good. These different studies have shown that the use of composite pain scales enables objective, repeatable and valid assessment of acute pain in horses. These scales are therefore used in various veterinary clinics to help guide the decision making on analgesic treatment and the patient's responses. Another way to assess the amount of pain horses are experiencing is to assess their facial expressions. Just like in many other species including humans, horses can show different emotions by their facial expressions. The muscles that are responsible for these facial characteristics have been described in a study called Equifacs (meaning the Equine Facial Action Coding System) by Wathan and colleagues (2015). Various pain scales based on facial expressions have been published, like the Horse Grimace Scale (HGS), the Equine Pain Face and the EQUUS-Facial Assessment of Pain (FAP). These scales have been used to describe facial expressions in horses suffering from post-operative pain, acute laminitis, acute colic, acute orthopaedic pain and horses suffering from acute dental and ophthalmic pain.

Facial expressions

The photos in this article show some examples of normal features of facial expressions on the left side images (normal forwards-oriented ear position, normally opened eye and relaxed lips and muzzle), and features that can be seen in horses experiencing pain on the right side photos (backwards oriented ear position, elevated wrinkled upper eyelid and tight lips and muzzle). Although there are some specific differences between the different facial expressions-based pain scales, there is a lot of similarity between them as well. In all scales, the position of the ears and response to sound is incorporated. Furthermore, the muscle tension of the muzzle, leading to tight corners of the mouth and the opening of the nostrils at rest is scored. The appearance of the eye, with elevated upper eyelid or tightened eyelids and the appearance of eye white is scored in most scales as well. In some of the scales, dynamic features like teeth grinding, moaning and flehmen are also incorporated. The similarity between these pain scales is that the horses are always observed at rest, preferably in their own quiet environment; this leads to most reliable results and avoids the possible influence of other factors. An English group of researchers has worked on expressions of pain in ridden horses and has also studied facial expressions that could indicate if horses are suffering from musculoskeletal pain. Features that they identified as possible indicators of pain during riding were backwards-turned ears, the mouth being opened, tongue out of the mouth, head tossing and tilting of the head and neck.

Equine Pain and Welfare App (EPWA)

After a fundraising campaign by the fund friends of Veterinary Medicine of Utrecht University in the Netherlands and foundation "De Paardenkamp" (The national shelter and knowledge centre for older horses), the Equine Pain and Welfare App (EPWA) was launched in 2018. This app can be used by both horse owners and veterinarians to reliably assess pain in horses and donkeys. The app contains the various composite and facial expression-based pain scales for acute and chronic pain in horses and donkeys that have been described by researchers from Utrecht University. The app calculates a pain score for the animal that is being assessed, based on the results of the assessment. Based on that pain score, the app indicates if pain could be present and whether it would be wise to call in a vet. Besides that, the app offers help with pain measurements and also has the option to keep track of information about training, exercise, nutrition and medical procedures in a diary. ■

THE VETERINARIAN

Dr. Thijs van Loon

ABOUT SMDC

Sporthorse Medical Diagnostic Centre (SMDC), based in the Netherlands, is a multidisciplinary centre of excellence where all orthopedic diagnostic and treatment modalities can be utilized in combination with experience, extensive knowledge and individual attention. Dr. Bergman, Dr. van Toor, Dr. Cokelaere, Dr. van Schie, Dr. van Loon, Dr. Hoogelander and Dr. van Veggel dedicate their time to optimize sporthorse performance while considering all factors which might influence it. Their caseload contains horses showing lameness but also includes horses with spine related problems, prepurchase examinations as well as preventative sporthorse care. www.sporthorsemdc.com