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COMPARATIVE PATHOBIOLOGY

Is Restraint with a Lip Twitch Aversive to Horses?

Introduction

Those who care for horses must often restrain them to complete routine husbandry or medical procedures. If scared or in pain, horses can increase the risk of injury to themselves or their handlers (Newton, 2005), and therefore require a humane and effective method of restraint.

Twitching is one method of restraint that is frequently used in the horse industry. It is the act of applying pressure to the horse's lip, ear, or skin using the hand or a twitch (Grandin, 2007). A twitch is a handheld pole with a loop made of rope or chain attached at one end. Most often, the loop is placed around the upper lip and then tightly twisted. Sometimes the lower lip or ear is used (Grandin, 2007). There are multiple methods to effectively twitch a horse; this article will focus on the upper lip twitch because the bulk of the research on twitching is focused there.

Upper lip twitching is not a substitute for training a horse to accept routine husbandry procedures such as ear clipping, hoof trimming, and shoeing. However, it can be necessary in brief or urgent situations

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when the horse cannot be trained and must be restrained, such as for treatment of injury, administration of sedatives, or placement of a nasogastric tube for colic. Twitching can also be used during situations where sedatives are unavailable, are unable to be utilized due to adverse reaction, or are less desirable, such as if an animal is lactating.

It is important to understand how upper lip twitching works, because even though it is commonly used, relatively little scientific evidence exists regarding whether twitching has a calming effect or is aversive to horses. Expanding the evidence base should yield stronger conclusions about twitching's implications for horse welfare.

Assessing welfare in horses

Animal welfare is often described in terms of the Farm Animal Welfare Council's (FAWC) five freedoms: (1) freedom from hunger and thirst, (2) freedom from discomfort, (3) freedom from pain, injury, or disease, (4) freedom from fear and distress, and (5) freedom to express normal behavior (FAWC, 1993). To broadly measure horse welfare, industry professionals often use the Animal Welfare Indicators Project (AWIN) protocol, which classifies welfare into four categories: good feeding, good housing, good health, and appropriate behavior (AWIN, 2015). More specifically, horse welfare can be measured with physiological metrics, such as heart rate, blood pressure, and cortisol level. Additionally, behavioral metrics and/or affective (emotional) state can be assessed (Wires, 2021). A horse experiencing fear, pain, or distress is likely to show increases in heart rate, blood pressure, and cortisol levels (Manteca & Deag, 1993). The same horse may also display behaviors typical of a flight response (e.g., stiff body, head tossing, stomping, or orientation away from the stimulus) (Young et al., 2012; Pereira-Figueiredo et al., 2017).

In contrast, a calm horse will show more neutral or affiliative behaviors, such as a relaxed body posture, lowered eyelids, or nuzzling of a handler (Young et al., 2012; Hall et al., 2013). In the instance of assessing horse welfare during the use of an upper lip twitch, non-invasive physiological metrics (e.g., respiration rate) and behavioral observation can be used to determine whether the horse is stressed or calm.

Perceptions and findings related to upper lip twitching

Upper lip twitching has been reported to influence horse behavior and physiology during procedures which many horses find aversive. In one study, horses that were twitched were calmer based on behavior and heart rate during ear clipping than those that were not twitched (Ali et al., 2017). Lagerweij and colleagues (1984) found that there was a decrease in horses' heart rates in response to painful stimuli when a lip twitch was placed, in addition to the appearance of sedation. They attributed this sedation to an acupuncture-like effect, stating that the pressure on the upper lip may decrease feeling in other areas of the body, allowing the horse to be less aware of painful stimuli (Lagerweij et al., 1984).

Alternatively, Minero and colleagues (1999) reported an immediate increase in heart rate in both crib-biting horses and horses that did not crib upon application of the lip twitch, suggesting that the procedure might be stressful to some degree (Minero et al., 1999). Another study reported an interesting result: Horses appeared relaxed for the first five minutes of lip twitching but then became agitated, based on their heart rate variability (Flakoll et al., 2017).

Overall, there are conflicting accounts on whether heart rate increases or decreases upon application of a twitch. Lip twitching may be calming during the initial five minutes but cause agitation if applied for longer. The study of ß-endorphin release supports this theory. ß-endorphins are released from the pituitary gland in response to pain and have an effect similar to strong pain-relieving medications (Sprouse et al., 2010). Lagerweij and colleagues (1984) found an increase in the release of ß-endorphins during lip twitch application, which may have led to calm behavior. However, McCarthy and colleagues (1993) found that ß-endorphins were doubled in horses' bloodstreams after the fifth minute of lip twitching (McCarthy et al., 1993). The authors stated that this increase in ß-endorphin release is too slow to explain the immediate sedative effects of lip twitching (McCarthy et al., 1993). While lip twitching appears to release pain-relieving ß-endorphins, it is possible they may be released due to the pain of the lip twitch itself, consequently leading to the observed sedative effects.

Though most horses may appear calm during use of a lip twitch, Hall and colleagues (2008) believe this effect is due to learned helplessness, not true relaxation. Learned helplessness is a behavioral response that can occur after an individual experiences many unavoidable, negative events. The animal or person learns that they have no control over themselves or their ability to escape the unpleasant stimuli or conditions. They therefore stop attempting to avoid them (Hall et al., 2008). In other words, a horse who is frequently lip twitched may find the procedure unpleasant, but because it has learned that it is unavoidable gives the appearance of tolerating it.

If twitching is unpleasant to the horse, not only might it compromise the welfare of the animal, but it may also put the handler in danger if the horse becomes agitated or otherwise has a negative reaction. Aversive handling experiences may increase fear, pain, and frustration in the horse, ultimately making future handling more difficult and potentially harming the human-animal relationship (Waiblinger et al., 2006). In one study, 19% of professionals who worked with horses reported being injured while using a lip twitch, which Parkin et al. (2018) suggested might have been due to the horses being agitated, although it is difficult to know the true cause of injury.

Conclusion

Evidence suggests that twitching can be a beneficial form of restraint in rapid and urgent situations but may be aversive if sustained for longer than several minutes. One limitation of the literature to date is that there has been no examination of the overall welfare effects of twitching alone; in all of the studies cited it was done along with other aversive procedures. While twitching is not typically done alone in the horse industry, it is important to determine the effect of the twitch itself. To fill this gap in the research, physiological metrics should be assessed during twitching alone, accompanied by use of an ethogram, or a list of behaviors to record upon observation. Additionally, an approach test done by the human who performed the twitching before and after the twitching procedure can offer insight as to whether the horse associates twitching with that person, and whether or not that association is positive.

Until a more definitive answer is available, handlers who use a lip twitch should understand and be able to detect signs of stress, fear, and discomfort in the horse to safeguard the horse's well-being.

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