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Reviewing the causes of obsessive-compulsive disorders in horses

Horses in stressful or erratically managed environments may develop this type of behavioral problem. Because treatment is often ineffective, eliminating the stressors that can lead to abnormal behavior is the best course of action in preventing these disorders.

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OVER 15% of domesticated horses exhibit stereotypies such as cribbing, windsucking, pawing, weaving, and head bobbing (D.B. McKeown; U.A. Luescher: Unpublished data, 1989). Stereotypies have been defined as repetitive acts that are constant in form and appear to serve no useful or obvious purpose.[1] This definition, however, is inaccurate. Some of these acts, such as stargazing and a prolonged urination stance, involve a fixed body position and therefore have no repetitive features. The motor pattern of a stereotypy may vary somewhat, particularly in the early stages of development. And some stereotypies, such as repetitive masturbation, have an obvious purpose, while many normal behaviors do not.

These abnormal behaviors are thought to be signs of an inadequate environment or improper care.[2,3] Until we can define these behaviors in terms of the specific neurophysiologic changes that occur in affected animals, it is less ambiguous to think of these acts as signs of an obsessive-compulsive disorder (OCD) rather than as stereotypies. The term *obsessive-compulsive disorders* is used in the human medical literature to describe behavior disorders in people that are similar to the stereotypies observed in animals.[4]

The terms *vices* and *bad habits* should be reserved for nuisance behaviors related to temperament or for unwanted learned behaviors. Vices include undesirable reactions to human handling, such as biting, kicking, striking, crowding, rearing, refusing to stand when mounted, running away, shying, halter pulling, refusing to load, and trailer scrambling. Like all conditioned responses and unlike OCD-related behaviors, vices can be readily corrected through proper handling and training of the animal.

In this article, we discuss common types of OCDs in horses and their likely causes. We also review the possible methods for treating and preventing OCDs. We hope to contribute to a better understanding of these behavioral disturbances and to correct the previously held and false view that OCDs

are vices reflecting a poor disposition. We also hope to promote a rational approach to treatment and prevention of OCDs.

Behaviors associated with OCD

Because OCDs are abnormal expressions of normal behavior, they can be classified according to normal motor patterns (walking, eating, grooming) and sexual behavior (*Table 1*).

Oral motor patterns

Oral signs of an OCD include cribbing, windsucking, tongue flapping, lip licking, and teeth grinding. Licking and chewing objects and eating dirt or bedding are also oral behaviors associated with an OCD, as are psychogenic polydipsia and polyphagia.

Locomotory motor patterns

Locomotory signs of an OCD include weaving, walking in place, fence and stall walking, pawing, door banging, foot stomping, stall kicking, head bobbing, and tail switching. Behaviors involving fixed body positions, such as stargazing, are also classified under locomotory motor patterns.

Grooming motor patterns

Compulsive acts associated with grooming include excessive grooming of self or other horses, tail and mane eating, prolonged tail rubbing, and body rubbing.

Sexual behavior

Masturbation in stallions is the most common sexual activity that may be performed as an OCD. Flank biting accompanied by kicking, an OCD of some stallions, may be derived from sexual aggression.

What causes an OCD?

The definitive causes of OCDs in horses are unknown. But several factors — an inherited susceptibility; an inadequate environment, which usually involves deprivation and improper management and training; and, in rare cases, conditioning — appear to work in concert to induce an OCD.

Inherited susceptibility

Horses may inherit both a sensitivity to stress and a susceptibility to expressing a particular behavior associated with an OCD. Studies have shown that horses are more likely to exhibit the same compulsive act if they are related.[5,6] Predisposition would explain why certain horses develop an OCD though other horses kept in the same environment and managed identically do not. The mechanism of inheritance is unknown.[6]

Inherited susceptibility to an OCD is even more apparent in dogs. Certain breeds and families of dogs seem to be predisposed to certain behaviors associated with an OCD (*e.g.* fly chasing in Miniature Schnauzers, whirling in Bull Terriers, and tail eating in German Shepherds).

Inadequate environment

OCDs have not been reported in free-ranging wild or semi-wild horses. The basic behavior repertoire of the domesticated horse is the same as it was 5,000 to 6,000 years ago. But the horse's environment has changed dramatically. Some horses are unable to cope with their artificial environments and the management system, which usually prevent many natural behaviors. The resulting insolvable conflicts induce a chronic arousal state. In this arousal state, the horse may develop activities indicative of conflict. It may, for instance, redirect its frustrated normal activity toward an inappropriate target object. Or it may perform a behavior without a target object (*i.e.* a vacuum activity).

If the stress is prolonged, a conflict behavior may become a stereotypy. That is, it becomes more repetitive and consistent in form, and is often reduced to few behavioral elements. A conflict behavior that developed in response to a specific situation may begin to occur in response to any unfavorable situation that causes the horse to reach a certain level of arousal. Moreover, a displacement activity temporarily expressed early in life may resurface later whenever the animal reaches a certain level of arousal.

Wild horses are gregarious grazing animals that live in complex social groups. Horses have a strong drive to form social bonds with other horses. A lack of social contact is thought to be one of the most serious stressors for horses. Some horses suffer separation anxiety when prevented from social contact with equine companions. If inter-equine socialization is impossible, horses may form strong bonds with other species, such as dogs, cats, goats, and people. If normal social behavior is prevented, this behavior may be redirected toward less suitable objects (*e.g.* flank biting) or may be performed as a vacuum activity (*e.g.* masturbation).

TABLE 1

Behaviors Associated With Obsessive-Compulsive Disorders

Oral	Locomotory	Grooming	Sexual
Cribbing	Weaving	Excessive grooming	Masturbation
Windsucking	Walking in place	Tail and mane eating	Flank biting and kicking
Tongue flapping, tongue hanging, tongue sucking	Fence walking	Tail rubbing	
Lip licking	Stall walking, stall digging, stall kicking	Body rubbing	
Licking and chewing objects	Pawing		
Jaw movements	Door banging		
Teeth grinding	Leg lifting		
Noise making	Foot stomping		
Eating dirt or bedding	Knee knocking		
Psychogenic polydipsia	Head bobbing, head shaking, head throwing		
Psychogenic polyphagia	Tail switching		
	Stargazing		
	Fixed urination stance		

Free-ranging horses spend 60 to 90% of their time grazing.[7,8] Stabled horses fed concentrated rations with little roughage are unable to fulfill this innate drive to graze. The frustration resulting from a horse's inability to graze may lead to redirected activities such as cribbing and wood chewing. These activities may eventually become compulsive.

Horses, like other domesticated animals, are sensitive to the stress of an unpredictable environment. Erratic management practices and inconsistent training methods are serious stressors for horses. Compulsive acts involving the head (*e.g.* tossing and circling), which frequently occur in highly trained riding horses, indicate inappropriate training methods.

One of the most serious stressors an animal can experience is the loss of control over its environment.[9] This occurs, for example, when a horse is prevented from avoiding aversive stimuli or from seeking out a different, more appropriate environment. A horse's innate response to aversive stimuli is flight. An environment that contains fear-inducing stimuli (human or otherwise) from which the horse cannot escape causes a serious conflict.

A motivational conflict results when the horse experiences two equally strong but opposing motivations. For example, young colts seek to establish dominance over their handlers. Their species-typical behavior for establishing dominance involves striking with a front leg. This dominance-related aggression usually prompts the handler to punish the colt, resulting in a conflict between aggression and fear in the colt. This conflict can result in a redirected, unrelated third behavior such as grooming or head bobbing, which may develop into a compulsive activity.

Learned compulsive acts

There is a strong belief among people who own or care for horses that normal horses have a tendency to learn compulsive acts from afflicted barn mates. Indeed, learning may play some role in the acquisition of a compulsive behavior,[10] though one study showed experimentally that adult horses are incapable of learning a response by observing other horses.[11] Perhaps a horse that copies a compulsive behavior was already near the threshold of expressing that behavior.

The frequency and intensity of any behavior is increased if that behavior is followed by a reward (*e.g.* being fed or touched or given attention). Compulsive acts typically exhibited just before feeding, such as pawing and door banging, are reinforced by food rewards. If horses receive their feed while conducting a conflict behavior, the behavior is likely to increase in intensity and frequency.

Treating OCDs

Once established, behaviors associated with an OCD are extremely difficult to correct. Treatment includes removal of stressors; desensitization or counterconditioning; and, once the conflict has been removed, physical interference with performance of the OCD. In the future, drug therapy may be effective.

Removal of stressors

To establish the cause of a compulsive behavior, the horse's environment, management, and training should be examined. But researchers have yet to identify and assess the importance of all the stressors that may cause an OCD. To identify every stressor and assess its seriousness, we need to start with an understanding of inherited equine behavior as observed in the natural environment, and an understanding of how animals learn. The type of OCD performed can give us valuable hints as to which natural behavior is frustrated. Redirected social behavior or sexual behavior point to-

ward social isolation as a cause of conflict. Wood chewing or cribbing point to an inability to graze as needed.

In some cases, a compulsive behavior may persist even after its cause has been removed. This makes the experimental removal of certain stressors a less valuable technique for isolating the cause. Furthermore, it is highly probable that the effects of all stressors in the environment are additive. Still, an attempt to remove stressors should be made.

Exercise is well known to reduce emotional stress in people. Allowing horses to exercise on pasture is probably an excellent means of reducing stress. It allows the horse some environmental control (*e.g.* the horse can "escape" or interact socially with other horses) and provides many natural stimuli (*e.g.* grass and social partners).

Desensitization

If a stressor cannot be avoided, the horse should be systematically desensitized to the stressor. This is achieved by gradually exposing the horse to the stressor. For example, a horse will better adapt to a long separation from a companion if the horse is first separated for a short period and then gradually for longer periods.

Physical prevention of OCDs

It is inadvisable and cruel to physically prevent the expression of an OCD without first identifying and removing environmental and management stressors. Once inadequacies of environment and management are corrected, physical interference with the activity (*e.g.* applying a cribbing collar) may be appropriate because the horse will be able to engage in alternative normal behavior. However, physical intervention should not include surgical procedures (neurectomy and myotomy) and painful aversion therapy (electric shock and physical punishment).

Drug therapy

Currently, there is not enough information available to recommend a pharmacologic approach to the treatment of an OCD. However, several experimental drugs may soon be available for treating OCDs in horses.

Naloxone hydrochloride or its longer-acting counterparts naltrexone, nalmefene, and diprenorphine temporarily stop compulsive activity in some horses by blocking the release of endorphins.[12] Haloperidol, a dopamine-receptor blocker, has been used successfully in rats to control some compulsive behaviors that were experimentally induced by amphetamine-like drugs.[13] Since the mid-1970s, various antidepressant drugs such as clomipramine hydrochloride, fluoxetine, and fluvoxamine, all of which are serotonin-uptake blockers, have shown some effectiveness as anti-OCD agents in people[4,14-18] and in dogs.[19]

Conclusion

In the future, a combination of conflict elimination, drug therapy, and counterconditioning will probably be the most promising method of treatment. For now, it is important to diagnose an OCD early and to make an effort to remove environmental and management stressors immediately. Our ultimate challenge is to use our knowledge of equine behavior to prevent OCDs.

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