

Prevalence of Compulsive Behaviors in Formerly Feral Horses

Nicholas H. Dodman, BVMS*

Jo Anne Normile†

Nicole Cottam, MS*

Maria Guzman, MS‡

Louis Shuster, PhD§

**Department of Clinical Science
Tufts University School of Veterinary Medicine
North Grafton, MA*

‡*Center for Animals and Public Policy
Tufts University School of Veterinary Medicine
North Grafton, MA*

†*Executive Director
Communication Alliance to Network Thoroughbred
Ex-Racehorses
Plymouth, MI*

§*Department of Pharmacology and Experimental
Therapeutics
Tufts University School of Medicine
Boston, MA*

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ABSTRACT

This study reports the results of a survey designed to determine the prevalence of equine compulsions in a group of formerly feral horses (mustangs) transitioned from the wild to a domestic situation. Seven hundred and sixty-five (765) surveys were mailed to adoptive owners of formerly feral horses. Surveys were completed by 243 owners, each representing one horse, a response rate of 38%. A prevailing hypothesis was that the prevalence of compulsive behavior in formerly feral horses would be higher than in domestic horses because of the lifestyle changes, relatively uninspiring new environment, and the stress of confinement. Alternatively, we conjectured that compulsive disorders may not occur in adopted horses because of their natural early lifestyle and late weaning. Only 6 of 243 adopted horses (2.4%) exhibited a compulsive disorder, indicating a relatively low prevalence. It is speculated that either mus-

tangs are genetically better suited to cope with the stress of confinement or that a natural early environment may confer some protective effect on the development of equine compulsive disorders.

INTRODUCTION

The term obsessive-compulsive behavior (OCD) has been recently introduced into veterinary medicine to cover a multitude of repetitive behaviors previously referred to as displacement behaviors or stereotypies.¹ Compulsions or stereotypies typically involve motor patterns associated with species-specific behaviors that ensure optimal survival of each species. In horses, compulsions reflect aspects of feeding, locomotion, and sexual behaviors.² Feeding stereotypies may include lip flapping, wood chewing, cribbing, tonguing, and aerophagia. Those related to locomotion include stall walking, weaving, and pawing. Masturbation and flank biting (also known as self-mutilation) are related to sexual behavior.²

The development of compulsive behaviors in horses is usually ascribed to exposure to

suboptimal environmental conditions in which horses are faced with insoluble conflicts.³ Environments are particularly stressful if they inhibit the expression of instinctive behaviors necessary to satisfy normal physiological and psychological needs.⁴ Thus, preventing a horse from performing its natural behavior by confinement, social isolation, and concentrated feeding could be viewed as a form of stress.² Some studies have proposed that performing stereotypies may reduce stress or anxiety.⁵ Humans with obsessive-compulsive disorder (OCD) report decreased anxiety resulting from the performance of their compulsions. OCD may thus be negatively reinforced by anxiety reduction. Over time, the behaviors appear to become ingrained and, at this stage, continue to be expressed even without any obvious triggers. It is as if the relevant neural pathways become “well-worn.”²²

Not every horse subjected to a stressful environment develops compulsive behaviors. Genetic factors may increase an individual's susceptibility.^{6,7} It has also been suggested that adverse early life experiences might have long-term effects on an animal's ability to cope with stress.¹ Studies in other species have demonstrated that young animals are influenced by their environment to a greater extent than older animals⁸ and, under captive conditions, youngsters are particularly prone to developing stereotypic behaviors.⁹ Specifically, the practice of early weaning is considered to be a major cause of stereotypy in some species, including rodents.¹⁰ Hart¹¹ suggested an association between premature weaning and “wool-sucking” and other aberrant behaviors in cats. Waters et al¹² conducted a four-year prospective study of 225 horses and found “unnatural” weaning to be an important factor determining later exhibition of compulsions.

The overall prevalence of compulsive behaviors in most horse breeds and domestic horse populations range from 3.5%¹³ to 34.7%¹², though two studies with outlier results found low prevalence, 0.7% and 0.65%, in Standardbred/coldbloods (trotters) and Standardbreds, respectively.^{14,15} Despite

the vast number of studies on the subject of domestic horse stereotypies, little is known about the prevalence of compulsive behaviors in wild horses. Apparently, compulsive behaviors do not occur in feral horses in the wild (personal telephone communication, S. Crowell-Davis, September 2003). Feral horses are known to dig, chew wood, and eat earth (geophagia), but such behaviors are considered functional, comprising part of horses' normal behavioral repertoire.¹⁶ Cribbing, wind-sucking, weaving, and circling, however, are dysfunctional behaviors. A question arises: Would feral horses be more or less likely to exhibit compulsive behaviors once in captivity than those raised under domestic circumstances? If environmental stress was the sole determinant, formerly wild horses might be expected to exhibit a high incidence of compulsive disorders as they would be less well suited to the constraints of stall life. However, if unnatural stresses (such as early weaning or social isolation) at an early stage of development are instrumental in the development of compulsive behavior, it might be expected that horses raised in the wild would show zero, or at least a low, prevalence of these aberrant behaviors when confined. In an attempt to address this question, we set out to establish the prevalence of compulsive behaviors in captive, formerly feral horses.

METHODS

In an attempt to control feral horse populations and manage federal grazing land, the Bureau of Land Management (BLM) in Reno, Nevada, annually rounds up feral horses and puts them up for adoption by the public. Wild horses (mustangs) of various ages and sex are culled, but only those 5 years of age or younger are eligible for immediate adoption. The decision to put a horse up for adoption is not based on the animal's temperament.

In 1995 the National Wild Horse Bureau Program Office randomly selected and supplied the names of owners of 1,000 adopted horses from Nevada BLM's “Wild Horse

Cribbing: Anchors upper incisor teeth on a surface, leans back, tenses neck muscles, and may engulf a bolus of air (aerophagia).

Wood chewing: Horse chews and nibbles at wooden ledges or surfaces causing appreciable damage. Wood splinters produced are not swallowed.

Stall walking/Circling: Walks compulsively around the perimeter of the stall for extended periods of time, often wearing a circular path in the bedding on a regular basis.

Fence walking: Running to and fro along a particular fence or barrier for extended periods of time on a regular basis.

Weaving: An abbreviated form of fence walking where the horse simply shifts his weight from one leg to another, weaving his head from side to side at the same time.

Pawing: Sometimes termed "digging." When the horse scrapes at the floor of the stall repetitively with one or the other fore foot. In stalls with soft floors, the horse can actually excavate a depression in the floor.

Spinning/Twirling: The horse runs in tight circles for extended periods of time on a regular basis.

Head nodding/Head bobbing: This behavior manifests as an up and down movement of the head and neck, which is performed periodically in sustained bursts throughout the day.

Flank biting: The horse turns its head and neck sharply to one or other flank or makes a downward darting movement toward the brisket area or upper forelimbs. In more severe cases, the horse may actually bite itself during these bouts. Bouts are sometimes accompanied by squealing and kicking.

Figure 1. Behavior Reference Sheet sent to horse owners with surveys.

Adoption Program" files. The horses' gender ratio was approximately 1:1 and, at the time of adoption (1992), the vast majority of them were yearlings. Only 3 horses were not yearlings; these were 3 months old, 7 months old, and 2 years old, respectively.

Horse owners were sent a letter of explanation, a survey and, in order to aid the owners in identifying compulsive behavior, a Behavior Reference Sheet (Figure 1). Owners were asked demographic information about themselves and their horse, including the horse's diet, turnout conditions, usage, and presence and severity of any existing compulsive behavior. Repetitive behaviors inquired about included: cribbing, stall walking/circling, fence walking, wood chewing, weaving, pawing, pinning/twirling, head nodding (bobbing), and flank biting/other forms of self-mutilation. Eighty-one pilot surveys were sent out in 1995 to establish the survey's understandability and provide some preliminary indication of prevalence. Eighteen responses were received regarding 20 horses. None of the owners of the 20 horses reported that their horse(s) engaged in compulsive behavior. Four of the 20 displayed wood-chewing behavior. After revision, the remaining sur-

vey forms were mailed out in 1997. A total of 765 revised surveys were sent out.

The data collected were analyzed using the SPSS statistical software package (SPSS, Inc.). Since wood chewing and pawing/digging were considered equivocal as compulsive behaviors (as all are naturally expressed), they were not included in our calculation of the overall prevalence rate of compulsive behaviors.

RESULTS

Of 765 surveys sent, 118 were returned as undeliverable. Of the 647 surveys that were delivered, 243 were returned completed by owners, a response rate of 38%. Each response concerned an individual horse.

Compulsive Behavior

Six of 243 horses documented were reported to exhibit at least one compulsive behavior. Five of the 6 exhibited a single compulsive behavior: 1 circled/stall walked, 1 fence-walked, and 3 were cribbers. One horse exhibited 3 compulsive behaviors: circling/stall walking, fence walking, and weaving. The overall incidence of compulsive behavior was thus 2.4% (6 of 243 horses). The incidence of cribbing was 1.2%. The

incidence of locomotor compulsions was also 1.2% (0.4 % stall walkers, 0.4 % fence walkers, 0.4% weavers). No horses were reported to exhibit head nodding/bobbing, spinning/twirling, or flank biting or other forms of self-mutilation. Owners were also asked to comment on the duration of the compulsive behavior. Respondents chose from 3 different options regarding the average length of time their horse spent engaged in the activity each day: mild = 1–3 hours per day, moderate = more than 3 hours but less than 6 hours per day, or severe = more than 6 hours a day. Four of the six respondents who owned a horse displaying compulsive behavior (67%) reported that the behavior was mild in terms of duration. The remaining two owners reported that the duration was moderate.

Animal Management

Feeding. The diets of most horses (65%) were reported to consist of a combination of hay, grain, and pasture. The rest of the horses were fed grain and either hay or pasture (17%) or only hay or pasture (also 17%).

Stall time. Approximately 66% of the horses spent between 0 and 5 hours per day stalled, 15% spent between 5 hours and 10 hours stalled, approximately 11% spent between 10 hours and 20 hours stalled, and 8% spent more than 20 hours per day stalled.

Acreage. The majority of the horses (81%) had access to 24 acres or less; 11% had access to between 25 and 74 acres, and 8% had access to 75 acres or more.

Social contact. The majority of respondents (84%) reported that their horses were turned out with other horses in the same pasture. Of those turned out with other horses, 93% were turned out with 9 or fewer horses.

Use. Most horses (66%) were used for pleasure riding; 12% of owners reported that their horse was simply kept at pasture, and 9% of horses were mainly used for other purposes, including breeding, driving, or trail work. A few (8%) horses were used for both riding and showing, and 5% were used both for riding and kept at pasture.

Age. The vast majority of the horses were

approximately 4 years old. Only 4 horses were 5 years old at the time of the survey, 3 horses were 6 years old, 1 horse was 7, and 1 was 3 years of age.

Reproductive status. The horses in our sample included 18 stallions (7.4%), 95 geldings (39.5%), and 130 mares (53.1%).

Chi-square analysis for associations between presence of compulsive behavior and management factors was not performed because of the low number of horses with compulsive behavior.

DISCUSSION

Our results show that compulsive disorders do occur in captive, formerly feral wild horses, though the prevalence is relatively low. However, potential for bias in our questionnaire-derived data exist. For instance, it is possible that the prevalence was underestimated because owners were reluctant to admit that their horse exhibited compulsive behavior. Alternatively, prevalence could have been overestimated if owners of horses with this condition were more likely to respond to the survey due to their interest in the subject matter.

It has been suggested that feral horses may develop fewer compulsive behaviors and may deal differently with environmental stress than domestically raised horses because as foals they are able to engage in natural behavioral agendas throughout their early developmental period. Adopted wild horses live naturally until they are rounded up for adoption. Their natural upbringing may make them less likely to respond adversely to environmental stressors by engaging in compulsive behaviors, because the compulsions are not primed while the horses are young. The corollary to this conjecture is that foals subjected to “unnatural” early life experiences, particularly sudden, early weaning, may engage in displacement behaviors that somehow become ingrained as coping mechanisms. Later in life, the behaviors may be elicited by a wider set of stimuli as a result of this priming. Adult compulsions, instead of reflecting current

problems, may represent something of a psychological “scar” from traumatic incidents experienced early in life.

Our study design precludes us from inferring cause-and-effect relationships. Because the development of compulsions in horses has been closely linked with management practices, it is important to rule out any possible confounders to ensure the validity of our results. The amount of time horses spend stalled has been reported to be one of the most important predictors of abnormal behavior.¹⁷ This one parameter also correlates to some extent with other risk factors such as diet, use, and social contact. The horses in the present study appear to have spent more time out of their stalls than horses in the study conducted by McGreevy¹⁷ and therefore it is possible that time spent out of stall is a confounding variable. Despite these limitations, an association between early adverse experiences and compulsive behaviors in horses is tentatively supported by the results of the present study.

CONCLUSION

Our findings suggest that mustangs are either less prone to compulsive behaviors for genetic reasons than many domestic horse breeds (barring perhaps Standardbreds/cold-bloods) or that the natural early setting experienced by mustangs has a protective effect on the subsequent expression of equine compulsive disorders. The inference from the latter possibility is that adverse early life experiences in captivity may contribute to the expression of compulsive behaviors in domestically raised horses.

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