

Dietary and Other Management Factors Associated with Equine Colic

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Changes in diet (particularly in the type of hay fed) contribute to increased risk of colic. A regular program for administration of anthelmintics can reduce the frequency with which colic develops, but recent administration of anthelmintics in some instances may predispose some horses to colic. Horses at pasture may be at lower risk of developing colic. Authors' address: Dept. of Large Animal Medicine and Surgery, College of Veterinary Medicine, Texas A&M University, College Station, TX 77843-4475. © 1999 AAEP.

1. Introduction

Equine colic is an important cause of disease and death in horses. Relatively few investigations have addressed management and preventive medical practices that may predispose horses to colic.¹⁻⁶ Identification of management factors significantly associated with colic would enable veterinarians to advise those caring for horses about ways to prevent colic and to develop equine health management programs that would reduce the incidence of colic.

The purposes of the study reported here were to investigate the association of recent dietary change with colic, to determine if specific types or amounts of dietary components were associated with colic, to determine if specific changes in diet were more likely to result in colic, and to examine other management factors associated with equine colic. Because horses examined at teaching hospitals and referral centers represent a small proportion of all horses with colic, we studied a large population of horses with colic examined by practicing veterinarians in Texas.

2. Materials and Methods

Participating veterinarians were recruited from a list of the veterinarians in Texas who were members of the AAEP during 1996 and from a list of veterinarians in Texas who were members of the Texas Veterinary Medical Association who described their practice as equine, large animal, or mixed-animal (including large animal) practices. Participation was solicited by mail from all 774 veterinarians identified from these lists.

Participating veterinarians were asked to provide data from 1 horse with colic and 1 horse treated for a noncolic emergency (control horse) treated each month between March 1, 1997 and February 28, 1998. A horse with colic was defined as the first horse treated during a given month for signs of intra-abdominal pain. A control horse was defined as the next horse treated for a noncolic emergency by the veterinarian who treated the horse with colic. Horses <6 months of age were excluded from the study. Data collection forms and prestamped re-

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turn envelopes were mailed to veterinarians on a monthly basis. For each horse included in the study, data were collected regarding signalment, farm management and characteristics, diet, medical or preventive medical factors, transport, and activity or use. Matched sets of horses with colic were compared with their control horses, using conditional logistic regression, to identify factors significantly associated with colic. The association of putative risk factors with colic was expressed using the odds ratio (OR), which can be interpreted as indicating how many times more (or less) likely an animal is to have colic, given that they have that factor. An odds ratio >1 implies increased risk and an OR <1 implies decreased risk (i.e., a protective effect).

3. Results

During the study period, 145 of the 774 veterinarians contacted (18.7%) participated and provided information for 1030 pairs of colic and control horses (2060 horses). The following factors were significantly associated with increased risk of colic using multiple conditional logistic regression (Table 1): recent change in diet; recent change in type of hay; history of previous colic; history of previous abdominal surgery for colic; recent change in weather conditions; recent change in stabling; Arabian breed; administration of an anthelmintic during the 7-day period before examination; failure to receive regular deworming; age >10 years; and regular exercise (vs. pastured at all times).

Table 1. Risk Factors for Colic in a Study of 2060 Horses Examined by Private Practitioners in Texas: Odds Ratios, 95% Confidence Intervals, and *p* Values.

Factor	Odds Ratio	95% Confidence Interval for the Odds Ratio		<i>p</i> Value
Recent diet change	5.0	2.6, 9.7		0.0001
Recent change of hay	9.8	1.2, 81.5		0.0346
History of previous colic	3.9	2.6, 5.9		0.0001
History of previous abdominal surgery for colic	4.6	1.0, 22.5		0.0624
Weather change during 3-day period before examination	3.2	2.0, 4.9		0.0001
Recent change in stabling	2.3	1.2, 4.1		0.0070
Regular deworming program (or not on regular deworming)	0.4 (2.2)	0.3, 0.7 (1.4, 3.3)		0.0001 (0.0001)
Anthelmintic received during 7-day period before examination	2.1	1.1, 4.0		0.0181
Arabian breed	2.1	1.1, 4.0		0.0202
Exercised at least once per week (versus pastured only)	1.6	1.2, 2.2		0.0033
Age >10 years	1.5	1.1, 2.0		0.0145

4. Discussion

The finding that change in diet during the 2-week period before examination was associated with colic is consistent with previous results of a similar study.³ A change in the type of hay was the only specific dietary change that significantly differed between horses with colic and control horses. Change in type of hay may result in colic for many reasons. Hay of poorer quality is often less digestible, thereby predisposing to colonic impaction. It is possible that changes in hay cause alterations in colonic pH, VFA production, and even the colonic microflora, conceivably predisposing to disorders of intestinal function resulting in colic.

The observation that receiving anthelmintics on a regular basis was associated with decreased risk of colic underscores our belief in the value of preventive deworming. Administration of anthelmintics, however, is not without risk. Colic was associated with recent deworming, irrespective of the product used. In foals, recent deworming may cause colic associated with intestinal obstruction resulting from rapid death of intraluminal ascarids, and recent (within 2 weeks) administration of an anthelmintic can increase the risk of intestinal disease associated with larval cyathostomiasis.⁶

A recent change in stabling was associated with increased risk of colic. Unfortunately, we did not collect information about specific types of changes in stabling because the principal objective of this study was to investigate the association between dietary factors and colic. In a study of horses examined by a private equine practice in the United Kingdom, recent change in housing management was the most commonly reported putative risk factor for spasmodic or undiagnosed colic.⁴

Horses that received no exercise other than that obtained in their pasture were significantly less likely to develop colic than were horses that were exercised at least once per week. This covariate was significantly associated with several covariates related to farm size or stabling management that were associated with colic in bivariate analysis, including farm acreage, low density of horses, being stalled $\leq 50\%$ of time, and having pond as water source. Our interpretation of these findings is that horses at pasture, which are generally from larger farms with lower density of horses, are at decreased risk of colic or being observed to have colic.

Change in weather during the 3-day period before examination was significantly associated with increased risk of colic. This finding must be interpreted with *considerable* caution because of the possible recall bias and the imprecise nature of the question.

Explanations for association of Arabian breed with colic include differing management practices for Arabians, increased awareness and concern about colic among Arabian horse owners or caretakers, or genetic predisposition to gastrointestinal disorders among Arabians. Alternatively, Arabian horses may

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have been at lower risk for being included in the control population (i.e., less likely to have had the problems common among controls which were lameness disorders and skin lacerations).

Increased age was associated with increased risk of colic. Older horses may have more opportunity for development of disease or exposure to causal factors. The incidence of certain forms of colic is more common among older horses (e.g., strangulating lipomas).

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References

1. Reeves MJ, Salman MD, Smith G. Risk factors for equine acute abdominal disease (colic): results from a multi-centered case-control study. *Prev Vet Med* 1996;26:285-301.
2. Tinker MK, White NA, Lessard P, et al. Risk factors for colic on horse farms: a prospective study. *Proceedings Fifth Equine Colic Res Symp* 1994;5:6.
3. Cohen ND, Matejka PL, Honnas CM, et al. Case-control study of management factors associated with equine colic. *J Am Vet Med Assoc* 1995;206:667-673.
4. Proudman CJ. A two year, prospective survey of equine colic in general practice. *Equine Vet J* 1991;24:90-93.
5. Kaneene JB, Miller RA, Ross WA, et al. Risk factors for colic in the Michigan (USA) equine population. *Prev Vet Med* 1997;30:23-36.
6. Reid SWJ, Mair TS, Hillyer, et al. Epidemiological risk factors associated with a diagnosis of clinical cyathostomiasis in the horse. *Equine Vet J* 1995;27:127-130.