Epidemiology of impaction colic in donkeys in the UK

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Introduction

Impaction colic is a common clinical condition affecting the welfare and survival of donkeys at the Donkey Sanctuary in the south west of the UK (Duffield et al. 2002a). However little is known about the prevalence of, or risk factors for, this condition.

Aim

By conducting retrospective analysis of the Donkey Sanctuary database we aim to
•describe the epidemiology of impaction colic in donkeys at the Donkey Sanctuary
•identify risk factors for impaction colic so that management interventions may be introduced to improve donkey health and welfare.

Method

Records of all donkeys (n=4596) housed at the Donkey Sanctuary between 1st January 2000 to 31st March 2005 were reviewed and all cases of colic classified according to the diagnosis by the resident veterinarian.

A retrospective matched case-control study was conducted on all impaction colics diagnosed between January 2003 and March 2005 (2 controls per case). Potential risk factors examined include
•age
•sex
•weight
•farm location
•previous colic in the year before the case
•routine treatment in the 30 days before the case (e.g. farriery, vaccinations)
•dental disease (missing teeth or abnormalities e.g. shear mouth)
•medical examinations for other disease in the 6 months before the case (e.g. musculo-skeletal).

Conditional logistic regression was used for univariable and multivariable analyses in EGRET (Egret for Windows 2.0, Cytel Software Corporation, 1999).

Results

A total of 807 colic episodes occurred during the study period, 54.8% of these were impaction colic (figure 1). Altogether 694 individual donkeys (15.1%) had colic at least once. The incidence of colic was 5.9 episodes per 100 donkeys per year and the incidence of impaction colic was 3.2 episodes per 100 donkeys per year.
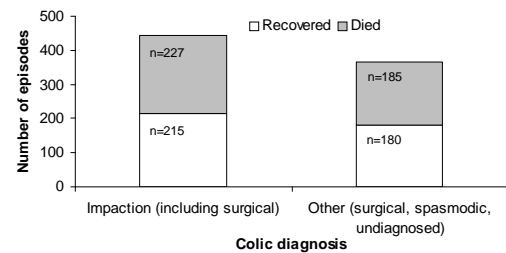

Figure 1. Colic episodes in Donkeys at the Donkey Sanctuary from January 2000 to March 2005.

There were 193 cases of impaction colic during the case-control study period. Variables that were significant (p<0.2) in the univariable analysis were considered for inclusion in the multivariable model. It was not possible to include the variables weight and dentition in the same model due to missing data, so two multivariable models were developed.

Model 1 excludes dental abnormalities (table 1) and indicates that age, weight, location, extra rationing, musculo-skeletal problems and previous colic are significant risk factors for impaction colic in donkeys.

Model 2 (table 2), which excludes weight and includes dental disease, indicates (after adjusting for age) that dental disease is a significant risk factor for impaction colic.

Variable		Odds Ratio	Lower 95% CI	Upper 95% CI	Wald test P value
Continuous					
Age		1.07	1.02	1.12	0.006
Weight		0.98	0.96	0.99	<0.001
Categorical					
Extra rations	No	1.00			
	Yes	2.09	1.02	4.30	0.04
Musculo skeletal exam	No	1.00			
	Yes	2.20	0.95	5.13	0.07
Previous colic	No	1.00			
	Yes	7.26	1.58	33.35	0.01
Farm location	1	1.00			
	2	0.47	0.21	1.04	0.06

Deviance 152.48. Liklihood ratio test 65.90 (p<0.001). Degrees of freedom = 6.
Table 1. Multivariable conditional logistic regression model of risk factors for impaction colic in donkeys (model 1)

Variable		Odds Ratio	Lower 95% CI	Upper 95% CI	Wald test P value
Continuous					
Age		1.09	1.00	1.182	0.03
Categorical					
Dental disease	No	1.00			
	Yes	29.73	3.95	223.67	<0.001

Deviance 42.51. Liklihood ratio test 53.77 (p<0.001). Degrees of freedom = 2.
Table 2. Multivariable conditional logistic regression model of risk factors for impaction colic in donkeys (model 2)

Conclusion

•The incidence of colic in donkeys appears similar to incidence in horses (3.5-10.6 episodes per 100 horses per year).
•Older donkeys, those fed extra rations, and those that had colic previously are at risk of impaction colic. These are known risk factors in other equines.
•Results support the hypothesis that dental disease is significantly associated with impaction colic by decreasing the digestibility of feed.
•Weight, musculo–skeletal problems and farm location appear to be important risk factors and are currently the subject of further research.

References
Duffield HF, Bell N. and Henson FMD (2002a) Factors associated with impactive colic in the donkey. *Proceedings of the 7th International Equine research symposium, Manchester, UK, pp122.*