



Lameness scoring of horses trotting on a hard straight line by visual observation compared to objective gait analysis

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Discussion/Conclusion

A huge variation was shown in the evaluation of horses in trot on a hard straight line. Neither between professionals, nor between professionals and Qhorse agreement was seen. Evaluating locomotion by professionals lacks objectivity, which is alarming for a method that is used on a daily basis. These findings further stress the need for more objective gait analysis techniques, as the gold standard, rather than visual observation of lameness by professionals.

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Introduction

During daily practice, lameness assessment in horses is routinely performed by visual observation. This traditional way of lameness exam is inherently subjective and the agreement between professionals (so-called inter-rater agreement) is known to be poor. This is one of the reasons why the use of objective, quantitative gait analysis techniques is actually rapidly gaining ground. Little is known about inter-rater agreement of locomotion of horses that were deemed 'owner sound'. In this study inter-rater agreement was assessed of visual lameness scoring and compared with objective gait analysis.

Material and methods

70 participants (equine veterinarians, equine physiotherapists and students (equine track) evaluated videos of 12 horses in trot on a hard straight line. Horses were deemed sound by their riders, and in daily use. Locomotion was scored as sound, forelimb and/or hindlimb lame. Objective gait analysis was performed using the Qhorse motion capture system (Qualysis). Cohen's kappa (κ) was calculated to evaluate the inter-rater agreement and compare observers with Qhorse.

Results

Participants scored lameness in 63.5% (533/840) observations. None of the horses was scored sound by all participants (i.e. 100% lameness). Qhorse scored lameness in 7/12 horses (58.3%) (Table 1). There was no agreement comparing Qhorse and participants ($\kappa=-0.04$). Inter-rater agreement for lameness (yes vs. no) between participants was very poor ($\kappa=0.06$). Comparison of forelimb and hindlimb lameness separately resulted in κ of 0.03 and 0.05.



Lameness scoring															
Horse	Subjective (visual observation)														Objective (Qhorse)
	Lameness [§]			Limbs (number)					Forelimb [§]			Hindlimb [§]			Limb(s) [§]
	0	1	%	0	1	2	3	4	0	1	%	0	1	%	
1	23	47	67.1	23	27	17	3	0	44	26	37.1	40	30	42.9	0
2	24	46	65.7	24	30	14	1	1	45	25	35.7	38	32	45.7	LH
3	17	53	75.7	17	40	11	1	1	40	30	42.9	39	31	44.3	RF, RH
4	15	55	78.6	15	27	22	2	4	37	33	47.1	33	37	52.9	RF
5	44	26	37.1	44	20	5	1	0	47	23	32.9	62	8	11.4	0
6	33	37	52.9	33	29	7	0	1	48	22	31.4	52	18	25.7	0
7	20	50	71.4	20	30	16	1	3	37	33	47.1	44	26	37.1	LH
8	29	41	41.4	29	30	10	0	1	44	26	37.1	48	22	31.4	RH
9	39	31	44.3	39	20	10	0	1	48	22	31.4	54	16	22.9	RF
10	26	44	62.9	26	19	20	3	2	57	13	18.6	32	38	54.3	LF, LH
11	21	49	70.0	21	25	18	2	4	35	35	50.0	48	22	31.4	0
12	16	54	77.1	16	31	17	2	4	31	39	55.7	44	26	37.1	0
Sum	307	533	63.5	307	328	167	16	22	513	327	38.9	534	306	36.4	

TABLE 1:
 Results of visual observation and objective gait analysis (Qhorse).
 Results of visual observation are presented as lameness, number of limbs, forelimb and/ or hindlimb, §(0= sound, 1= lame). Results of objective gait analysis are presented as lame limb(s). The green coloured cells highlights agreement between visual observation and objective gait analysis.