

RISK FACTORS ASSOCIATED WITH INJURIES IN THOROUGHBRED HORSES

Hussni O. Mohammed, T. Hill*, and J. Lowe

Thoroughbred breeding and racing are large industries in the United States. Few studies have attempted to evaluate some of the factors which hinder the development of this industry and minimize associated losses (Jeffcott *et al* 1982; Kobluk *et al* 1988; Rossdale *et al* 1985). Fractures in racehorses are conventionally thought to be related to bad racetrack conditions; this opinion is based on subjective impression rather than hard facts. A report (Hillet *et al* 1986) on racing injuries in 68,397 starts by Thoroughbred racehorses at New York Racing Association (NYRA) tracks indicated that the track condition had no apparent influence.

Several risk factors hypothesized to associate with breakdowns were investigated (Jeffcott *et al* 1982; Kobluk, *et al* 1988; Krook and Maylin, 1988; Robinson, 1988). However, these studies have neglected the multivariate approach in evaluating the association. Palmer (1986) reported a higher prevalence of carpal fractures among Thoroughbred rather than Standardbred horses. The objective of this study was to identify factors associated with the risk of musculoskeletal injuries (breakdowns) among Thoroughbred race horses and quantify their risk.

MATERIALS AND METHODS

A case-control study was used to identify factors associated with breakdowns in racetracks. A breakdown was defined as a horse which didn't race within 6 months following a muscular or skeletal injury on the racetrack. These cases were selected from the Horse Identification Department records kept by the Chief Examining Veterinarian of NYRA. The forms included records on horses raced at NYRA tracks (Aqueduct Main, Belmont, Saratoga). Cases included all reported injured horses during the period of January 1, 1986 to June 30, 1988.

A comparison group (control horses) was selected from Daily Racing Form, Inc., records. For each injured horse, 2 controls were selected. The controls were selected in such a way as to include horses whose names appeared either before or after the injured horse in the alphabetized listing.

*Department of Clinical Sciences New York State College of Veterinary
Medicine, Cornell University Ithaca, NY 14850*

**Department of Horse Identification New York Racing Association
P.O. Box 90 Jamaica, N.Y. 1141*

Data related to racetrack location, condition of the track, date of birth of the horse, sex, sire, dam, date of injury, history of injuries, date of start, number of starts, race number, and position of race were collected. The data were collected either from the Horse Identification Department records or from the Microfiche provided by the Daily Racing Form. Stepwise (backward) multiple logistic regression in BMDP (Dixon *et al* 1988) was used to identify factors significantly associated with the risk of breakdown and quantify their effects. A variable to use as a proxy for strain on a horse was developed; this "strain" variable was computed as the total number of starts per year in racing and was used in the logistic regression.

RESULTS

Data were collected on 310 case horses and 620 controls. The majority of the injuries among live horses occurred in the front limbs (47% left and 41% right, respectively). Only one injury was reported to occur to the spinal cord. Thirty-two of the injured horses (10%) had a history of previous breakdown (as defined earlier). The most common severe injury was a fractured canon bone which was experienced by 55% of the horses.

The bivariate association between the race track and the likelihood of breakdown is shown in Table 1. Multivariate analysis showed no significant difference in the risk of breakdown among horses raced on Aqueduct Main (dirt) or Aqueduct Inner (dirt), however, horses raced on Belmont dirt-track appeared to have a decreased risk of breakdown compared to horses raced on Aqueduct Main. The risk was not statistically significant. Horses raced in Saratoga had an eleven fold decreased risk of breakdown compared to horses raced on Aqueduct Main. There was a significant association between track conditions and the risk of breakdown.

Other factors associated with the risk of breakdown were number of seasons in racing; season of the year in which the horse raced; number of starts per year; also was found to contribute to the risk of breakdown. As the number of starts per year for the horse increased the risk of breakdown decreased. Horses raced 7 to 12 times per year were three times less likely to break down compared to horses which raced 6 times or less.

The average of the total number of starts for a horse in the study population was 24 (± 19). The risk of breakdown decreased as the total number of starts increased. The average age of horses in the study population was 3.5 (± 1). In the multiple logistic regression analysis horses in cases and controls whose age was greater than 6 years were grouped together with 6 old horses. The risk of breakdown increased with the age of the horse.

Our study has indicated that there is a difference in the risk of breakdown among different tracks, however, this risk might not be directly due to the track but due to other factors associated with the track. Track condition also plays a significant contributory role to the risk of injury with turf tracks associated with the least risk.

REFERENCES

- Hill, T.D., Carmichael, D., Maylin, G., and Krook, M., 1986. Track condition and racing injuries in Thoroughbred horses. *Cornell Vet.*, 76:361-379.
- Jeffcott, L.B, Rossdale, P.D., Freestone, J., Frank, C.J., and Towers-clark, P.F., 1982. An assessment of wastage in Thoroughbred racing from conception to 4 years of age. *Equine Vet. J.*, 14:185-198.
- Kobluk, C.N., Gordon, B.J., Trent, A.M., and Robinson, R.A., 1988. Epidemiology of injuries during racing and training: A cohort study of 95 horses racing at Canterbury Downs During 1987. *Proc of AAEP*.
- Krook, L., and Maylin, G., 1988. Fractures in Thoroughbred racehorse. *Cornell Vet.*, 78 Suppl. 11:1-133.
- Robinson, R.A., 1988. Epidemiology of injuries during racing and training: A case control study of breakdown occurrence at Canterbury Downs. *Proc AAEP*.
- Rossdale, P.D., Hopes, R., Wingfield, D., and Offord, K., 1985. Epidemiological study of wastage among racehorses 1982 and 1983. *Vet. Rec.*, 116:66-69.

Table 1. Comparison^a of risk of breakdown between different NYRA tracks

Track name	Number of horses		Odds ratio		
	Cases	Controls	Aqueduct M	Aqueduct I	Belmont
Aqueduct Main	84	81	1.0		
Aqueduct Inner	62	50	1.2 (0.7 - 2.0) ^b	1	
Belmont	129	147	0.9 (0.6 - 1.3)	1.4 (0.9 - 2.3)	1.0
Saratoga	25	219	9.1 (5.3 -15.7)	10.1 (6.0 -19.7)	7.8 (4.7 -12.8)

^aComparisons are columns to rows

^b95% confidence interval for the odds ratio