Descriptive epidemiology of fractures and tendon and suspensory ligament injuries in National Hunt racehorses in training

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Introduction

- Musculoskeletal injuries are the most important cause of lost training days in racehorses and have a significant welfare and economic impact on the racing industry.
- Racecourse studies have consistently shown higher risks of injury in horses racing over jumps ('National Hunt' (NH) racehorses) compared with those racing in 'flat' races.
- No large-scale epidemiological studies of injuries occurring in NH racehorses during training have been conducted.

Aims

1. **To estimate the incidence of fractures and tendon and suspensory ligament injuries (TLIs) in NH racehorses during training and racing.**
2. **To compare injury incidence rates by horse age, trainer, gender and background (ex-flat vs ex-store) *.**
3. **To describe the injuries incurred.**

** Horses previously in training for flat racing and those specifically bred for jump racing ('stores'). The two groups differ in age at start of training , breeding, conformation and previous racing and training experience.*

Materials and Methods

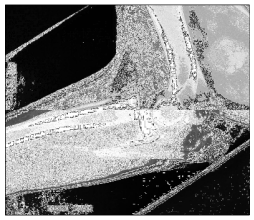

Figure 1: X-ray image of fractured radius and ulna (image courtesy of Dr Renate Weller)

- Cohort data were collected from 14 English NH training yards between October 2003 and April 2005. This included 2 racing seasons.
- Horse data, daily exercise regimens and details of fractures and TLIs occurring in study horses were recorded.
- **Fracture case definition**: any fracture diagnosed via imaging or post mortem. Catastrophic fractures with an unambiguous clinical diagnosis also included.
- **TLI case definition**: any injury to the superficial digital flexor tendon (SDFT), deep digital flexor tendon or suspensory ligament (SL) diagnosed ultrasonographically. Severe TLIs with an unambiguous clinical diagnosis also included.
- Comparisons of injury rates by age, gender, background and trainer were performed by fitting univariable Poisson regression models on summary data of injury numbers and days at risk.
- The level of statistical significance was set at p=0.05.

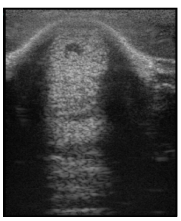

Figure 2: Ultrasound image of SDFT core lesion

Results

1,223 horses spent 9,459 months at risk of injury

Fractures:

- **100 fractures** included in analyses.
- **Fracture rate = 1.1/100 horse months** (95%CI: 0.9-1.3).
- Rates varied significantly by **trainer** (p<0.001) but not by gender, age (*figure. 5*) or background.
- **Pelvis**, **third metacarpal bone** (MCIII) and **tibia** were the most common fracture sites but this varied between racing and training (*figure 3*).

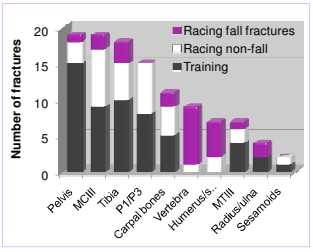

Figure 3: Training, racing fall and racing 'non-fall' fracture locations

- 54% of racecourse fractures were fatal compared with 13% of training fractures.
- Following fracture, 54% of horses returned to racing (*figure 4*).
- Time between fracture diagnosis and return to racing ranged from 1 to 31 months with a median of 10 months.

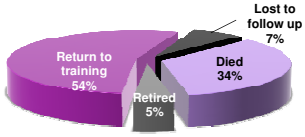

Figure 4: Fracture outcome

Tendon and suspensory ligament injuries:

- **184 TLIs included in analyses.**
- **TLI rate = 2.0/100 horse months (95% CI: 1.7-2.2).**
- Rates varied significantly by **trainer** (p=0.05) and **age** (p<0.001) (*figure 5*) but not by gender or background.
- **Ex-store horses were twice as likely to have a TLI on the racecourse than ex-flat horses** (95% CI: 1.1 – 3.4, p=0.009) (*figure 6*).

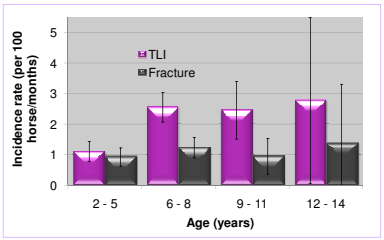

Figure 5: Fracture and TLI incidence rates by age group

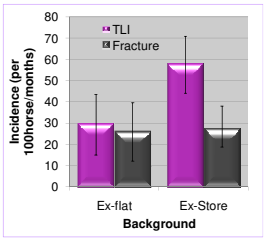

Figure 6: Racecourse fracture and TLI rates by background

- SDFT injuries accounted for 89% of all TLIs, the remainder being SL injuries.
- Following TLI, 74% of horses returned to racing (*figure 7).*
- Time between TLI diagnosis and return to racing ranged from 1 to 34 months with a median of 15 months.

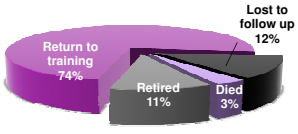

Figure 7: TLI outcome

Conclusion

- **Fractures and tendon/ligament injuries are important causes of morbidity and mortality in NH racehorses in training in England.**
- **The reported results provide accurate estimates of their incidence and provide a baseline against which to monitor the effect of future interventions.**

Acknowledgements: *Trainers and veterinarians who participated in this study; Graham Hatt, Peter Dron, Alice Murphy and Elizabeth Morgan. Work initially supported by a Horserace Betting Levy Board project grant and is currently funded as a Royal Veterinary College PhD scholarship. Data collection was carried out at the Animal Health Trust, Newmarket, UK.*