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Identifying risk factors for equine injury and fatality on the racecourse

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Introduction

In many countries around the world, horseracing is an extremely popular sport. However, racing is a high-risk activity, and equine injury and fatality rates have important welfare implications. Identifying the factors that predispose horses to injury and fatality on the racecourse may allow the development of intervention strategies, so this is an important step towards minimising these risks and enhancing animal welfare.

Discussion

According to a study by Bailey et al. (1998) in Melbourne, 2.9 per 1000 starters among horses racing on the flat suffered a musculoskeletal injury that either resulted in euthanasia or failure to race again for no less than six months. Fractures below the level of the radius or tibia (distal limb fractures: DLF) are the most common cause of equine fatality on racecourses in the U.K. (Parkin et al., 2004a, 2004b). Two concurrent reports were aimed at identifying possible horse-level risk factors (Parkin et al., 2004a), and race- and course-level risk factors (Parkin et al., 2004b) for this potential outcome in all different forms of racing. Both of these reports used a case-control study design.

Parkin et al. (2004a) matched each case animal with three random uninjured controls from the same race. A case was considered to be a horse that required euthanasia after DLF on any racecourse in the U.K. Information was collected on the previous racing experience, individual details of, and training information for all case and control horses. Conditional logistic regression analysis was used to determine relationships between the different factors and fatal DLF, with significant results used in the creation of multivariable models. The final results demonstrated that there was a significantly increased risk of DLF on the racecourse for horses in their first year of racing, horses that trained on a sand surface and those that had no gallop work in their training sessions. Risk initially declined as gallop work was introduced and increased, but then increased again when horses were galloped for long distances. This suggests that modifying the training program may be beneficial to prevent fatal DLF (Parkin et al., 2004a).

Risk factors of fatal DLF not only relate to the individual horse, but also to different types of racing, and even different courses of the same type (Parkin et al., 2004b). This is shown in the significantly variable rates of equine injury and fatality that occur between different courses (Mohammed et al., 1991; Bailey et al., 1998). The investigation into race- and course-level factors by Parkin et al. (2004b) employed all races in the U.K. in which one or more horses sustained a fatal DLF as case races. Two analyses were performed, each utilising a different method of selecting controls (races of the same type in which no fatal DLF occurred). Analysis 1 selected three races held within 5 days of the case to reduce horse-related effects, such as number of days in training, while Analysis 2 selected three races from throughout the same year to prevent partial matchings on time-related factors such as climate and going (Parkin et al., 2004b). Conditional logistic regression analysis was used in the same way as in the report above. It was shown that longer races, and those with higher numbers of runners, were more likely to result in DLF, as was firmer going and a shorter time since the last race-meet on the course. The result of increasing risk as the going becomes firmer presents a possible strategy for improving welfare through course maintenance.

Although DLF is a significant contributor to equine fatality in all types of racing, there are other risk factors that predispose to injury and fatality, which may differ between the individual race types. Falls at fences, for example, are estimated to be associated with approximately 42% of fatalities in jump racing (Pinchbeck et al., 2002), with vertebral fractures more common than

in flat racing (Williams et al., 2001). Pinchbeck et al. (2004a) attempted to identify and quantify risk factors for horse falls during National Hunt (NH) racing (i.e. jump racing) and reported on frequency of falling and subsequent fatalities. This study was conducted on starts in hurdle and steeplechase races on six U.K. racecourses, and any horse that fell at a fence was considered a case. Information on horse, race and jockey was collected from different sources, including racecards, interviews with handlers/trainers and observation in parade ring. Data from both race types were analysed together and separately, using multivariable logistic regression models, similar to methods above. Results showed that shorter travel time and calm behaviour on the day of the race were associated with a decreased risk of falling in both race types. In steeplechase, younger horses had an increased risk of falling, while softer going was associated with a decreased risk. Potentially modifiable factors noted are travel distance and course maintenance, the latter of which was also demonstrated in the report of Parkin et al. (2004b) and Bailey et al. (1998). By examining video recordings for circumstances surrounding falls, Pinchbeck et al. (2004b) in a concurrent study identified increased whip use as another modifiable factor that may increase risk of falling.

These studies have focused on specific hazards of horseracing in the U.K. and the risk factors identified may not be applicable in other countries or situations in which circumstances are different. Also, the studies discussed only allowed two outcomes in their analysis, for example, either the horse was recorded as sustaining a fatal DLF or not, as Parkin et al. (2004a, 2004b) ignored other causes of fatality and non-fatal injuries, thus limiting the scope and relevance of the research.

Conclusion

While no activity can be made entirely risk-free for horses, these studies have identified several significant risk factors for equine injury and fatality in racing, some of which can be modified. This knowledge can be used to improve the welfare of racehorses, though additional research is required to identify further risk factors and to develop the most effective risk-minimisation strategies.

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