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The effect of interruptions during training on the time to the first trial and race start in Thoroughbred racehorses

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ABSTRACT

Few studies have investigated the effect of having interruptions during training on future training and racing performance in Thoroughbred racehorses. The aim of this paper was to investigate the effect of having an interruption before the first trial on starting in a trial or a race. A prospective cohort study was used to record the training activity of a cohort of Thoroughbred racehorses, over two racing seasons. Fourteen racehorse trainers recorded information on the distances worked at canter and at fast speeds (<15 s/200 m) and provided reasons for horses not training, or for having interruptions (break from training). Trial and racing results were obtained from the New Zealand Thoroughbred Racing online database. A Cox proportional hazards regression model was used to investigate two outcome measures of performance: (1) time to the first trial and (2) time to the first race. The type of interruption that had occurred before the first trial was the main exposure of interest, and was grouped into: no interruption, voluntary (no known condition or disease present) and involuntary interruptions (due to the presence of a condition or disease).

A total of 160/200 (80%) horses started in at least one trial and 100/205 (48%) horses started in at least one race during the study period. The median time to starting in a trial or a race differed significantly ($p < 0.001$) with the type of interruption. The hazard of starting in a trial was lower for horses experiencing voluntary and involuntary interruptions ($p < 0.001$) but there was no association with starting in a race, after adjusting for confounding variables. As age at the start of training increased the hazard of starting in a trial decreased. Horses accumulating longer distances at 15 s/200 m had a higher hazard of starting in a trial, whilst horses accumulating fewer events at high speed and fewer trials had a reduced hazard of starting in a race. There was significant clustering at the trainer level for both the outcomes investigated. Interruptions to training had an effect on the time to, and hazard of, a trial but not a race start. The timing of these interruptions may have implications for future racing success and career longevity.

1. Introduction

In both New Zealand and the USA, there has been a steady decline in the number of starters and starts per horse, over recent seasons (McCarthy, 2008; Anonymous, 2011a). One of the major threats the industry faces is the loss of horses from training and racing due to lack of talent, or as a result of musculoskeletal injury (MSI). A detailed prospective epidemiological study of racehorse training reported that 65% and 35% of retirements from training were due to voluntary and involuntary events, respectively (Perkins et al., 2004a).

A number of terms such as: spell (Perkins et al., 2004a,b; Bolwell et al., 2010), layup (Carrier et al., 1998; Estberg

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et al., 1998), and interruptions have been used to describe the rest periods given to horses during training. Perkins et al. (2004a,b) identified training preparations that had voluntary or involuntary interruptions, classified as more than 7 days out of training, and described the conditions causing the interruptions and their effect on the number of starts and places per start. Other studies show that exercise distances performed during training were associated with racing performance (Verheyen et al., 2009; Ely et al., 2010); suggesting training distances should be considered as potential confounders for other observed associations of horse and trainer-level variables with racing performance.

A number of outcome measures, such as starting in a trial or race, winning a race, amount of prize money won, and number of starts (Cheetham et al., 2010; Tanner et al., 2012) are often used in an attempt to quantify racing performance. In New Zealand, trials are used as a competitive event to allow an opportunity for horses to practice before a race, however, compared to a race, there is no betting on trials.

Bolwell et al. (2010) reported that the first training gallop and the first trial were important milestones used by trainers when evaluating a horse's progress. Similarly, race starts are the important milestone that provides the first opportunity for a financial return. Reaching key milestones, such as being registered with a trainer, trialling and racing as a 2-year-old, appears to be positively associated with racing success and career length (Bailey et al., 1999; More, 1999; Tanner et al., 2011, 2012). Exercise, specific types of injury, age, and trainer have been found to be associated with the time to the first trial (Bailey et al., 1999; Cogger et al., 2008), but these studies did not consider the occurrence, or type, of an interruption to training.

Information on the effect of interruptions on training and racing milestones is scant. We have recently conducted a prospective cohort study, carried out in New Zealand, following 2-year-old racehorses over two racing seasons, and identified risk factors for voluntary (no known condition or disease) and involuntary (condition or disease present) interruptions (break from training) occurring during training before the first trial (Bolwell et al., 2012). Determining the effects of interruptions on future athletic racing performance may assist in making important training decisions, and affect how a horse progresses through training to racing. The aim of the work reported here was to investigate the effect of an interruption to training on the time to starting in a trial or a race. We hypothesised that there would be an association between an interruption to training and the time taken to start in a trial or race.

2. Materials and methods

2.1. Sample population

Training data of a cohort of Thoroughbred racehorses were collected over two racing seasons, of which details of enrolment of trainers and horses have been reported (Bolwell et al., 2012). Briefly, 14 racehorse trainers were selected as part of a convenience sample to record the daily training activity for their 2-year-old racehorses. Horses were enrolled into the study when they first entered the trainers' yard for training as a 2-year-old (earliest date 10th March 2008) and were followed for two racing seasons until the 31st July 2010 (the end of the New Zealand racing season). A sample of 131 horses was required to detect a hazard ratio of 2 with 80% power and precision of 0.05.[1]

2.2. Data collected

The daily training activity such as the distances (furlongs) worked at canter and at high speeds (<15 s/200 m) were recorded. Full details on the methods of collecting training activity have been described (Bolwell et al., 2012). Briefly, trainers recorded data using specifically designed, standardised paper forms or provided copies of, or access to, their own paper records. Trainers were asked to provide reasons for horses not training, information on health events that occurred during training, and the dates of trials and races. Further information on the distances, places, total prize money, end of season rating for the 2008/09 and 2009/10 racing seasons, and date of birth were obtained from the New Zealand Thoroughbred Racing online database. The dates of trials and races provided by the trainer were validated against the online database and where a difference was seen, the date was replaced with the official date from the database.

2.3. Statistical analysis

2.3.1. Exposure variables

The type of interruption (first occurrence only) that had occurred before the first trial was the main exposure of interest, and was grouped into: no interruption, voluntary (no known condition or disease present) or involuntary interruption (due to the presence of a condition or disease). Voluntary interruptions were based on decisions made by the trainer as part of the training programme, rather than instances where diagnoses of conditions or diseases could not be reached. Horses that were away from the training yard, or not in work for >7 consecutive days were considered to have had an interruption (any type) to the training programme (Perkins et al., 2004b). The distances accumulated since entering training at canter (>15 s/200 m) and speeds of 15 s/200 m and 13 s/200 m, were calculated. Other training exposures accumulated since entering training were: the number of days off, high speed events (12 s/200 m), jump outs (a practice start out of gates at high speed), swimming days, water walker days, days off, and trial starts (for starting in a race). Additional exposure variables investigated were daily walking time (on a mechanical walker), age (months) at the start of training, sales background (yearling sale horse versus non-sale), gender, and trainer.

2.3.2. Outcome variables

Two measures of performance (events) were used: (1) time from entering training to the first trial and (2) time from entering training to the first race start. Whilst starting in a trial or a race were considered as desired outcomes

[1] http://www.swogstat.org/stat/public/Survival/two_survival.htm.