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BRIEF COMMUNICATION: The prevalence of limb deformities in New Zealand Standardbred foals and their influence on racing success – A preliminary investigation

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INTRODUCTION

Within the New Zealand racing industry, breeders and purchasers of racehorses seek foals with good conformation as racing and breeding prospects. There is a perceived association between correct conformation and the duration and success of racing careers (Weller et al., 2006a). However, to date there has been limited data on the effect of limb deformities on any parameters of racing success (Morley & Townsend, 1997, Anderson et al., 2004). Horse racing in New Zealand is a billion dollar industry and the success of the sale of horses as yearlings is vital to the continuing success of New Zealand horses in the international market. With reductions in the annual foal crop of the Thoroughbred and Standardbred it is increasingly important to minimise wastage within the breeding and rearing environment to ensure there is sufficient high quality product available for sale and racing. The first stage in minimising wastage is the quantification of the impact variables on the likelihood of a successful outcome, in this case a racehorse capable of competing for a number of racing seasons.

In Thoroughbreds and Quarter Horses Anderson et al. (2004) were able to identify an association of variations in foal conformation with injury during race training by physically scoring foals. However, in the Standardbred, previous studies have focused on the relationship between radiographic abnormalities and racing success. There have been no New Zealand studies to date that have investigated the physical scoring of foals and subsequent racing success in Thoroughbreds or Standardbreds. Although physical scoring may not be as objective as radiographs, it provides some insight into the overall conformation and conformational changes that occur as the foal ages. Anecdotal evidence suggests that foals that have a non-straight conformation of the limbs do not appear to race with the same level of success as foals that have a straight conformation of the limbs (Weller et al., 2006b, van Weeren & Crevier-Denoix, 2006). The primary objective of this study was to investigate the prevalence of angular and flexural limb deformities in New Zealand Standardbred foals and the association of these deformities with racing success.

MATERIALS AND METHODS

Data Collection

Limb deformity data were routinely recorded on two commercial Standardbred stud farms in New Zealand. The clinical inspection of foals, within one day after birth, was carried out on both farms by an experienced equine clinician and/or the foaling attendant. The conformation of the front and hind legs were scored using qualitative scales encompassing: Normal, Varus (Medial deviation), Valgus (Lateral deviation), Flexural deformity (Contracted tendons) and Crooked conformation of the hind limbs.

Foals presenting with a flexural deformity were, if required, routinely given 10 ml of Oxytetracycline (Engemycin®, Intervet/Schering-Plough, Upper Hutt, New Zealand) intravenously. This was repeated one to two times, depending on the response of the limbs. If a foal had severe varus or valgus deviation and the veterinarian deemed it necessary to treat the conformational change, a periosteal strip was performed. Other conservative treatments such as foal confinement and corrective farriery were also used but not recorded in this study. The efficacy of these treatments was not examined in this preliminary study of the prevalence, rather than treatment, of limb deformities. Angular and flexural limb deformities were combined for all statistical analyses and renamed “Limb deformities” (LD), due to the low prevalence of angular deformities.

The data used in this study covered the 2004-05 and 2005-06 breeding seasons and the racing seasons up to 2008-09 when the foals were at the completion of their four (2004-05 foal crop) and three (2005-06 foal crop) year old seasons. Foals that died before 1 September 2007 were excluded from the data to assess racing performance, but were included in the prevalence of angular and flexural limb deformities. Foals that were not born on the
Prevalence of total limb deformities at birth in 1,379 foals on two commercial Standardbred farms in New Zealand.

<table>
<thead>
<tr>
<th>Description</th>
<th>Farm 1 2004-05</th>
<th>Farm 1 2005-06</th>
<th>Farm 2 2004-05</th>
<th>Farm 2 2005-06</th>
<th>Mean ± standard error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of foals</td>
<td>351</td>
<td>429</td>
<td>266</td>
<td>333</td>
<td></td>
</tr>
<tr>
<td>Number of foals with no limb deformity</td>
<td>280</td>
<td>341</td>
<td>235</td>
<td>262</td>
<td>279 ± 22</td>
</tr>
<tr>
<td>Number of foals with a limb deformity</td>
<td>71</td>
<td>88</td>
<td>31</td>
<td>71</td>
<td>65 ± 12</td>
</tr>
<tr>
<td>Proportion of foals with a limb deformity (%)</td>
<td>20</td>
<td>21</td>
<td>12</td>
<td>21</td>
<td>19 ± 2</td>
</tr>
</tbody>
</table>

DISCUSSION
The fact that only 19.8% of the horses in this dataset qualified for racing before the age of two is of concern from an individual and industry perspective.
perspective. There is a growing body of evidence to suggest that exercise early in life is associated with greater orthopaedic health and longer racing careers (Barneveld & van Weeren, 1999; Rogers et al., 2008a; Rogers et al., 2008b). For racing administrators it is important that horses start racing as two-year-olds to ensure there is sufficient racing product to maximise betting returns.

The prevalence of LD in this study was higher than in an earlier study carried out in Thoroughbreds (O'Donohue et al., 1992). There have been no previous studies in Standardbreds reporting the influence of LD on racing success. In Thoroughbreds, Weller et al. (2006b) found that a valgus conformation of the metacarpophalangeal joint, had a detrimental effect on racing performance and was associated with an increased prevalence of injury. A possible explanation for this is the possible increased load on musculoskeletal structures.

Although there was no significant difference detected in total prize money won, total amount of starts and, total amount of prize money per start, this could be due to the heterogeneous nature of the racing data and the relatively small dataset available for this analysis. The trend for LD foals to qualify for racing later and the finding that only one of the foals exported had LD as a foal, indicates that LD at birth may have an influence on lifetime performance. This study is continuing, and the addition of future foal crops for analysis should provide a more precise measure of the association of LD and racing success. To confirm this requires a larger dataset and greater refinement of the evaluation system.

CONCLUSIONS

Angular and flexural limb deformities at birth may have a negative association with racing performance. The parameter most influenced by LD was the age of qualifying. There was a tendency that foals without LD were 1.5 times more likely to qualify before the age of four. The results obtained in this study emphasize the importance of further studies to obtain a greater understanding of the influence that angular and flexural LD have on racing performance, and further investigation should be carried out into causative factors for LD in horses.

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REFERENCES


