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Can early training of show jumpers bias outcome of selection events?

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Abstract

Evaluation of free jumping at sub-maximal heights is common practice within selection procedures for young breeding stallions. Early training might cause an unjustified bias. To investigate this, data from a 5-year longitudinal study on 30 horses were used. Half of these horses (experimental group) had received early training between 6 months and 4 years, the other half (control group) had not. Between 4 and 5 years, all horses had received standard training under saddle. At the age of 5 years, the horses were tested in a puissance competition and the 7 best and 6 worst jumpers were used for the present study. Kinematic variables that were different at ages 5 years and 6 months, and had been shown to be predictive for performance in earlier studies, were analysed at the age of 4 years. It showed that early training had effaced the differences between potentially good and less good show jumpers in 3 of 3 predictive variables and had introduced a (false, because not related to performance) difference between the trained and untrained horses in one of them and a nearly significant trend in another.

Early training may to a certain extent obscure differences in talent among individuals at the age at which selection events occur. Experienced judges may be able to account for this, but studbooks and judges should be aware of this possible pitfall.

Keywords: Horse; Selection for breeding; Early training; Kinematics; Show jumping

1. Introduction

The goal of breeders of Warmblood horses is to produce excellent performance horses that can perform in top-level competitions. It is commonly accepted that performance traits are heritable (Barneveld, 1996; Barrey and Langlois, 2000; Koenen et al., 1995), so

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selection of horses for breeding purposes based on their own ultimate performance in competition is a rational and secure way to produce an offspring of good performers. However, there is a severe drawback when this principle is applied. Unlike in Thoroughbred and Standardbred racing, in show jumping, it is not until around the age of 6 years that the horse is ready to compete and participating in competitions at the international top-level will not take place until approximately the age of 10 years. Selection at that age would slow genetic progress considerably. To solve this problem, most leading European warmblood studbooks use free jumping performance for the selection of animals at an early age, usually 3 or 4 years. The procedure varies slightly per studbook, but generally judges will evaluate would-be sires when free jumping over a three-fence combination that has been set at a sub-maximal height. Criteria include forelimb technique, hind limb technique, way of use of the back, power, elasticity and carefulness of the horse during the jump. Such a jury assessment is inherently subjective, but may suffer from additional confounding factors as well because the candidates have been raised under different environmental conditions. One important environmental factor is the training status of the horses as some breeders will start specific jumping training at young age prior to the selection event and others will not. If training would affect one or more of the criteria mentioned above, it could have a confounding effect on the selection procedure, as the true potential of the horses might be obscured.

Recently, a large 5-year longitudinal study into the development of jumping ability and the effects of early training thereon has been concluded (Santamaría, 2004). Using a puissance competition as a test for ultimate performance, it was concluded from that study that certain kinematic variables related to forelimb and hind limb use when clearing the fence (relative length of the forelimb, elbow angle, stifle angle and degree of retroflexion of the hind limbs) at foal age had predictive value for performance of the adult horse (Bobbert et al., 2005). From that same study, it was concluded that training at early age had no effect on ultimate performance (Santamaría et al., 2005).

The present study uses data from this longitudinal study to assess retrospectively whether, and if so to what extent, the early training that had been given from 6 months to 3 years had affected the variables that later turned out to be discriminative for prediction of performance. In order to achieve this, data concerning these predictive variables collected at 4 years of age were compared with respect to training background and to later performance. The hypothesis was that early training would have no significant influence on these discriminative variables and hence would not cause a potential bias in sire selection procedures.

2. Materials and methods

2.1. Experimental design of entire project

An extensive overview of the entire project is given elsewhere (Santamaría, 2004; Bobbert et al., 2005). Briefly, at the age of 6 months, 40 foals were made to jump a fence, while kinematic data were collected. The foals were then randomly divided into a control group and an experimental group. The animals in the control group were raised conventionally, i.e. they were given free exercise until breaking at the age of 3 years. The animals in the experimental group had the same basic exercise pattern but received additional specific jumping training. The training regimen was executed consistently throughout the entire period, but was not very intensive. It basically consisted of training in a horse walker 3 days a week to guarantee a sufficient overall condition and free jumping low obstacles twice a week. At 4 years of age 15 animals from each group (a total of 10 being discarded for economical reasons) were joined again to start an intense common 1-year training programme for show jumping. All animals were kinematically analysed while jumping at the beginning and at the end of this year. The training year was concluded with a puissance competition with fence heights up to 1.50 m. In this competition, horses had to jump a three-fence combination. The first fence remained at a height of 60 cm, the second one was 1.00 m during the first jump and was raised to 1.10 m during the second and following jumps, and the third one was raised from 1.00 m to 1.50 m with increments of 10 cm. In total, the horse had thus to perform a minimum of 6 jumps (provided they did nor refuse at any of them). Horses were classified in 3 categories based on the results of this competition: best (faultless until and