



Original Research

Subjective Gait Assessment of 57 Sports Horses in Normal Work: A Comparison of the Response to Flexion Tests, Movement in Hand, on the Lunge, and Ridden



Sue Dyson*, Line Greve

Centre for Equine Studies, Animal Health Trust, Newmarket, Suffolk, UK

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ABSTRACT

Historically, lameness has been evaluated in hand or on the lunge, but some lamenesses may only be apparent ridden. The objectives were to compare the response to flexion tests, movement in hand, on the lunge, and ridden in sports horses in regular work, assumed to be sound by the owners. It was hypothesized that lameness may be apparent in ridden horses that was not detectable in hand or on the lunge. Fifty-seven sports horses in regular work and assumed to be sound were assessed prospectively in hand, on the lunge on both soft and firm surfaces, and ridden. Flexion tests of all four limbs were performed. Lameness was graded (0–8) under each circumstance in which the horse was examined and after each flexion test. Fourteen horses (24.6%) were sound under all circumstances. Six horses were sound in hand, on the lunge, and ridden but showed a grade 1 or 2 lameness after flexion of a single limb. Sixteen horses (26.3%) were lame in hand. Twenty-four horses (42.1%) showed lameness on the lunge on a soft surface, and 23 horses (40.4%) were lame on the lunge on a firm surface. Twenty-seven horses (47.4%) showed lameness ridden; seven (12.3%) were only lame ridden. There was no significant association between age ($P = .09$) or work discipline ($P = .1$) and lameness. It was concluded that freedom from lameness in straight lines is not a reliable indicator of soundness. Some lamenesses are only apparent ridden.

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1. Introduction

Traditionally lameness has been evaluated in hand or in circles, but there is an increasing body of evidence that some lamenesses are only apparent when horses are ridden [1,2]. However, this has not been quantified. Ridden exercise is not part of a prepurchase examination in many countries in Europe and America. In New Zealand, ridden exercise at canter is used for assessment of the respiratory and cardiovascular systems but not for gait

evaluation [3]. A similar system applies in Australia [4]. In the United Kingdom, ridden exercise is a mandatory part of the prepurchase examination, in part to “allow assessment of the horse’s gait at walk, trot, canter and, if appropriate, gallop” [5].

Flexion tests and the likely response in horses free from lameness have long been debated because of the variable techniques used, the duration of flexion and the force applied during flexion, and potential horse-to-horse and day-to-day variability in responses [6–14]. However, as part of a lameness examination, it is well recognized that flexion tests, while not necessarily specific, may highlight the presence of lameness and in some instances may predict the likely source of pain [15]. Flexion tests are widely used in prepurchase examinations but are not a mandatory part of the examination in the United Kingdom: “Flexion tests of

The study was approved by the Ethical Review Committee of the Animal Health Trust, and there was informed owner consent.

* Corresponding author at: Sue Dyson, Centre for Equine Studies, Animal Health Trust, Lanwades Park, Kentford, Newmarket, Suffolk, UK.

E-mail address: sue.dyson@ahtr.org.uk (S. Dyson).

all four limbs and trotting in a circle on a firm surface may be carried out if the examining veterinary surgeon considers it safe and appropriate to do so" [5].

In a sample of 506 sports horses presumed to be sound and in regular work, 46% showed lameness or other gait abnormalities which were presumed to be pain related [16]. These horses were assessed moving in hand and ridden but were not evaluated on the lunge and flexion tests were not performed. There are a number of studies in which objective assessment of gait has been performed in circles [17–19] or after hindlimb flexion [14] in horses assumed to be sound horses based on assessment in hand only. Some of the results were consistent with observations that one might expect to see in lame horses, highlighting the need for a more rigorous definition of what constitutes a sound horse [20]. To our knowledge, there has been no study assessing a group of horses in regular work and considered sound and comparing the gait in hand, on the lunge on soft and hard surfaces, and ridden and the response to flexion tests.

The aims of this study were to compare evaluation of sports horses in regular work and assumed to be sound moving in hand, on the lunge, and ridden and the response to flexion tests. It was hypothesized that (1) the response to flexion may predict the presence of lameness on the lunge or ridden in horses appearing sound in straight lines and (2) lameness may be apparent in ridden horses that was not detectable in hand or on the lunge.

2. Materials and Methods

2.1. Horse Selection

Horses were selected for inclusion in the study if they were in regular work and assumed to be sound by their riders, trainers, and owners. This was a convenience sample of horses derived from four yards in proximity to the authors and comprised a professional showjumping yard, S ($n = 17$), a dressage competition yard, DC ($n = 5$), a dressage training center, DT ($n = 27$), and a private dressage yard, DP ($n = 7$). Age, breed, gender, size (height determined from the passport and body weight estimated from a weight tape [Virbac, Barneveld, Holland]), work history, and level of training or competition were recorded. All horses were examined by an experienced lameness clinician (SJD; Royal College of Veterinary Surgeons Specialist in Equine Orthopaedics) moving in hand on a hard surface approximately 40 to 50 m long (yards S and DC, a nonslip flagstone surface; yard DT, an unmade-up road; yard DP, a tarmac road with an incline), and on the lunge in a 15-m diameter circle on both a soft surface (yards S and DC, an indoor arena with sand and fiber on a very firm base; yard DT, an indoor arena with a deep nonuniform sand surface with a small amount of fiber; yard DP, an outdoor arena with a thin sand cover on a firm base) and on a firm surface (yards S and DC, a nonslip flagstone surface with a slight slope in two directions; yard DT, a firm grass surface on an incline [some unduly exuberant horses were run in hand]; yard DP, on a driveway covered by small chippings). All horses were also assessed ridden around the perimeter of an arena on the right and left reins in working trot rising (with the rider sitting on left

and right diagonals, respectively) and in canter and in 10- to 15-m diameter circles (depending on the horse's level of training) in working trot rising (yards S and DC, an indoor arena approximately 25 m \times 60 m, with sand and fiber on a very firm base; yard DT, an outdoor arena approximately 25 m \times 60 m, with sand and a small amount of fiber; yard DP, an outdoor arena approximately 20 m \times 60 m with a thin sand cover on a firm base). Horses were ridden by the regular rider or trainer. The horses were assessed from two corners of the arena so that all were assessed from behind, in front and from the side. The presence of lameness was graded on a 0 to 8 scale [21] under each circumstance. During ridden exercise, a stiff stilted gait in canter and quadrupedally shortened cranial phase of the step were noted [16].

Distal limb flexion tests of the forelimbs and proximal limb flexion tests of the hindlimbs were performed in a standard order (left fore, right fore, left hind, right hind) for 1 minute each after the initial in-hand assessment. All flexion tests were performed by the same experienced clinician (SJD). A positive response was the presence of lameness for more than three strides. The grade of lameness was documented. All horses were handled by experienced people, familiar with the horses. They were asked to allow the horses to trot at their preferred speeds in hand and on the lunge. The speed was not standardized among horses. All horses were led from the left side when trotting in hand. A lunge rein was attached to the inside bit ring for lungeing exercise. All horses at each yard were assessed consecutively in hand, after flexion tests, and on the lunge. Ridden exercise of all horses was then performed in a randomized order.

2.2. Lameness Grading

An overall grade of sound was given if no lameness was detectable in hand, on the lunge, or ridden, and lameness of not more than 1/8 was detected in a single limb after flexion tests. The horses were divided into ten sound or lame groups (Table 1).

2.3. Reassessment of Horses

Horses ($n = 20$) free from lameness, except grade 1 or 2 after flexion of a single limb, were reassessed 4 to 14 days later on an arena surface in hand, on the lunge, and ridden by the same rider as previously, performing the same movements. Video recordings of the horses were acquired from two corners of the arena, so that horses were assessed from in front, behind, and the side. The video recordings were assessed once by one author (SJD) who was not present at the second examination, and the presence of lameness was recorded as a binary yes/no for each limb and was graded. The video recordings of the horses judged to be lame were reassessed to verify the presence of lameness.

2.4. Statistical Analyses

Descriptive analysis was carried out for horse data and the outcomes of lameness examinations. Estimates of the frequency of occurrence of positive flexion tests, lameness

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