

SIGNIFICANCE OF ROUTINE RADIOGRAPHIC FINDINGS IN STANDARDBRED TROTTERS: A RETROSPECTIVE COHORT STUDY

**WILLEBERG, P.^a, STORGAARD JØRGENSEN, H.^b, PROSCHOWSKY, H.^c,
FALK-RØNNE, J.^d, HESSELHOLT, M.^d**

The ability of equine practitioners to offer professional advice to clients in connection with pre-purchase and insurance examinations is greatly limited by the scarceness and inconsistency of data documenting the clinical significance of various radiological findings, including those of osteochondrosis (OCD) in the tibio-tarsal joint. OCD is a common radiographic diagnosis in trotters with prevalence ranging from 4% - 20% in various populations (eg. Hartung et al., 1978, Alvarado et al., 1989).

Although it has been claimed that OCD has a negative influence on performance of trotters (Hoppe and Phillipson, 1984), Alvarado et al. (1989), Jeffcott (1991) and Laws et al. (1993) all could not support that conclusion. Similar ambiguity exists concerning the clinical significance of bone fragments in the metacarpo/metatarsophalangeal joints (Yovich et al., 1986).

The purpose of the present study is to document probable relationships between routine radiological findings and the subsequent performance and longevity of trotters.

MATERIALS AND METHODS

The material comprised 243 trotters born in 1986, 1987 or 1988. They had been radiographically examined at the age of 1 to 1 1/2 years (i.e., before the onset of training) for routine purposes (eg. before being sold or as a part of an insurance procedure) in a specialized practice associated with the Danish Trotting Society.

The phalanges of each limb were radiographed in latero-medial views. Plantolateral-dorsomedial oblique views were obtained of both tibio-tarsal joints. All radiographs were simultaneously reevaluated in a blind fashion by the same person and radiological findings were categorised into six groups (see Table 1).

Information on racing performance was obtained from the records of the Danish Trotting Society for the four year period 1/1/1988 to 31/12/1991. The parameters used to evaluate racing performance were: number of starts per year of active racing, earnings per year of active racing, and earnings per start.

For descriptive purposes, we constructed 'survival' tables and graphs based on the number of horse years at risk and the number of retired horses which were counted for each racing season within each birth cohort (Kahn and Sempos, 1989). In Cox regression analysis (proportional hazards model; Kahn and Sempos, 1989) we allowed for delayed entry when modelling the effects of diagnostic group, birth cohort, sex and age at first race on the hazard of retirement (and consequently on the complementary survival rate, ie. horses remaining active in racing per horse year at risk).

^aDepartment of Animal Science and Animal Health, Division of Ethology and Health, Royal Veterinary and Agricultural University, Bulowsvej 13, DK-1870 Frederiksberg C., Denmark.

^bDepartment of Clinical Studies, Large Animal Surgery, Royal Veterinary and Agricultural University, Bulowsvej 13, DK-1870 Frederiksberg C., Denmark.

^cState Veterinary Institute for Virus Research, Lindholm, DK-4771 Kalvehave, Denmark.

^dCharlottenlund Racetrack, DK-2920 Charlottenlund, Denmark.

The data were subjected to file handling, data analysis (Chi-square-test, ANOVA) and graphing using the computerised systems EpiInfo (Dean et al., 1990) and Quattro Pro^e. Survival analysis by Cox proportional hazards model was performed with EGRET^f.

RESULTS

Of the 243 horses, 148 (61%) were found to have one or more radiological lesions diagnosed, while 95 (39%) had no radiological changes. One hundred sixty nine horses (70%) participated in at least one race within the study period. The prevalence of the respective types of radiographic lesions appear in Table 1. Tibiotarsal osteochondrosis in one or both joints was observed as the only finding in 14 % of the horses.

Table 1. Distribution of 243 trotters by diagnostic group and their subsequent racing history

Group	Diagnosis	All horses	Non-starting horses	Horses racing	Horse-years	Retired horses	% retirement	
		No. (% of total)	No (% of all horses)	total (at risk) ^a	total (at risk) ^a		of horses	of horse years at risk ^a
0	No findings ('normal')	95 (39%)	33 (35%)	62 (39)	115 (61)	8	21	13
1	OCD tibiotarsal joint	33 (14%)	13 (39%)	20 (17)	43 (26)	3	18	12
2	OCD & other fragments metacarpo-/metatarso-phalangeal joints	39 (16%)	6 (15%)	33 (22)	59 (29)	3	14	10
3	OCD in different joints	4 (2%)	1 (25%)	3 (1)	4 (1)	0	-	-
4	Traumatic lesions	29 (12%)	9 (31%)	20 (10)	33 (14)	1	10	7
5	Combined lesions	43 (18%)	12 (28%)	31 (23)	56 (34)	9	39	26
Total		243 (100%)	74 (30%)	169 (112)	310 (165)	24	21	15
1 - 5	Any lesion	148 (61%)	41 (28%)	107 (73)	195 (104)	16	22	15

^aAt risk of retirement, i.e. only those racing before the 1991 season contribute.

There was no significant association between radiological changes and the proportion of horses not starting: 15-39% (mean 28%) of affected horses compared to 35% of normal horses (Table 1). Of the 169 horses which started in races, 107 (63%) had radiographical lesions diagnosed. The average number of starts per year of active racing was almost the same (10.9 and 10.8 starts, respectively) for the 107 affected and for the 62 non-affected horses, and there were no significant differences among the types of lesions found. Neither were there any significant differences in the earnings per start and per year among the groups.

^eQuattro Pro Version 4.0. Borland International, Inc., Scotts Valley, California 95067.

^fEGRET Version 0.25.6. Statistics and Epidemiology Research Cooperation (SERC), Washington 98105.

A total of 24 out of 112 horses at risk (21%) were retired, of which 8 out of 39 (21%) were in the 'normal' group (Table 1). Comparison of 'survival' by time in the three combined birth cohorts of trotters were made between horses with different types of lesions, allowing for delayed entry into active racing. No obvious differences in retirement and thus in their 'survival' could be observed between the groups. The results of the Cox regression model support these conclusions, although Group 5 (combined lesions) had a marginally significantly higher hazard ratio than 'normal' horses.

DISCUSSION

Sixty one percent of the trotters in our study were given a radiological diagnosis. In a similar study it was found that 73% of standardbred horses had radiographic abnormalities (Alvarado et al., 1989). The question is whether this high proportion represents true pathological changes or may be due to normal physiological/radiological variation as proposed by Hartung et al. (1978) in relation to bone spavin in young trotters. They question the prognostic value of routine radiological examinations without indication based on clinical symptoms.

Also no apparent differences in prognosis existed in our study among the diagnostic groups based on routine radiographs. The use of routine radiographic examinations as an indicator of racing potential, as described in this investigation, is therefore questionable, and the reasons for carrying out such examinations should be reevaluated. The trotters in this investigation, however, were followed in only 2-4 racing seasons and search for potential long term effects on racing performance and longevity is still needed.

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