

Parameters influencing prevalence and outcome of tendonitis in Thoroughbred and Arabian racehorses

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Abstract

Flexor tendonitis and suspensory desmitis are among most prevalent musculoskeletal injuries observed in racehorses. The aim of this study was to determine which horse and race-related parameters can help to diminish the possibility of injury or – when injury has occurred – to evaluate the potential for the horse to continue a successful career after convalescence. Special attention was given to the comparison of Arabian and Thoroughbred racehorses.

187 horses with ultrasonographically visible lesions were included in the study. Following parameters were analyzed: structure (Superficial Digital Flexor Tendon [SDFT], Deep Digital Flexor Tendon [DDFT], Suspensory Ligament [SL]); percentage of cross sectional area increase; hypoechogenic lesion character; in horses with SDF tendonitis – tendonitis grade according to Genovese.

This study showed that Thoroughbreds are more at risk of musculoskeletal problems than Arabian racehorses. In both breeds, the most frequent injuries concern SDFT, then SL. Over 95% of tendonitis concern forelimbs. In Thoroughbreds, the prevalence of tendonitis is higher in bigger horses, in males when compared to females and in fence / steeple racehorses when compared to flat track racehorses. The inside limb is more at risk of SDF tendonitis, when the external limb – of SL desmitis. Tendonitis severity increases with age and is greater in steeplechasers when compared to flat track racehorses. The outcome of tendonitis without hypoechogenic lesion is much better than that with hypoechogenic lesion. Evaluation of hypoechogenic lesion length is an easy and accurate prognosis tool, as the chances of returning to racing drop dramatically with lesions longer than 12 cm.

Key words: tendonitis, racehorse, Thoroughbred, Arabian, ultrasound, prognosis

Introduction

Overstrain injuries of the Superficial Digital Flexor Tendon (SDFT) and Suspensory Ligament (SL) are among the most common musculoskeletal injuries observed in the athletic horses (Genovese et al. 1990). Studies performed over the years (Kłos 1995) have shown a relatively constant percentage of flexor tendonitis fluctuating around 10% of lameness cases. In the Thoroughbred racehorses they are the most common cause of wastage – 25% (Parkin et al. 2006b). Tendon injuries are also of high concern, as the reinjury rate is high (Dyson 2004).

In the last years, the biomechanics of the flexor tendons and SL in the fore limbs has been investigated. It has been shown that the strain pattern of the SDFT and SL is similar, but very different from the strain pattern of the Deep Digital Flexor Tendon (Pourcelot et al. 2005). These studies confirmed that considering SDF tendonitis and SL desmitis as similar pathophysiological entities is scientifically judicious.

Tendonitis is generally a forelimbs problem (Genovese 1997, Lam 2007). The induction of clinical tendonitis occurs when loading overcomes the resistive strength of the tendon. Factors that increase the peak loading of the SDFT, such as weight of the rider, ground surface or speed may rise the rate of degeneration and increase the risk of clinical tendonitis. The most common strain-induced injuries in horses are believed to be preceded by a phase of degeneration (Smith and Goodship 2004). Therefore prevalence of tendonitis increases with age, as shown by Kasashima et al. (2004), Perkins et al. (2005), Lam et al. (2007).

Materials and Methods

The study was performed on racehorses that sustained injury of flexor tendons or suspensory ligament when training or racing at the Warsaw Racetrack in 2001-2006 and were presented for this cause to the Equine Hospital¹.

Thoroughbreds and Arabians train and race separately, however most trainers have both breeds in their stable. In 2001-2006 about 1100 racehorses were trained each year in preparation for racing at the Warsaw Racetrack. The majority (mean 718) were Thoroughbreds, the remainder (mean 396) were Arabians. The Thoroughbreds start training and racing as 2 years old, when Arabian – as 3 years old. The career of a race horse lasts in average 3 years in Thoroughbreds and 2 years in Arabian, however good horses

can be raced for even 6 seasons or longer. Each year about 191 Thoroughbreds and 195 Arabian finished their racing career and were replaced by young horses arriving from studs.

Horses suspected of tendonitis were presented to the Equine Hospital based on the observation by the trainer of a recent heat or swelling, with or without associated lameness. After thorough clinical examination, ultrasound examination was performed on 274 horses (only first examination was noted). For this purpose palmar metacarpal/metatarsal aspects of the sore limb and its opposite were clipped. The skin was thoroughly cleaned with water and acoustic gel was applied. In years 2001-2005 a Pie Medical Anser Vet 485 ultrasound machine with 7.5 MHz, 4cm linear probe was used. In 2006, it was replaced by TELEMED Echo Blaster 128 machine with 6-10 MHz, 4cm linear probe.

In the study 187 horses were included with:

- hypoechoogenic lesion within flexor tendons / SL, and/or
- increase in the maximal tendon/ligament cross-sectional area of more than 40%, and/or
- an increase of the total tendon / ligament cross-sectional area of more than 20%.

Routine ultrasound examinations were performed from 4 cm below the accessory carpal bone to the level of the apex of the proximal sesamoid bones. To standardize the examinations on Thoroughbred and Arabians ultrasonographs were performed at 6 equal levels: A1, A2, B1, B2, C1, C2 (Fig. 1). At each level, tendon and lesion cross-sectional areas were measured.

Results of the ultrasound examination were recorded and evaluated using the following parameters:

1. Structure [SDFT (and its AL), DDFT (and its AL) or SL (and its branches)].
2. Percentage of Cross Sectional Area Increase (%CSA) and Percentage of Total Cross Sectional Area Increase (%T-CSA).

SDF tendonitis, especially when no hypoechoogenic lesion is present, is often bilateral. Therefore, the cross sectional area increase was calculated based on published references: Köster's et al. (2001) data for Thoroughbreds and Celimni's et al. (2004) for Arabian horses. The %CSA was calculated dividing the difference between tendon cross sectional area and the referring value (and statistical difference) at the same level, by this reference value (plus statistical difference) and multiplying the result by 100%. Total Cross Sectional Area (%T-CSA) was calculated by summing cross sectional areas of the six levels and dividing it by the sum of the reference cross sectional areas (and statistical differences), then multiplying this sum by 100% and subtracting 100%.

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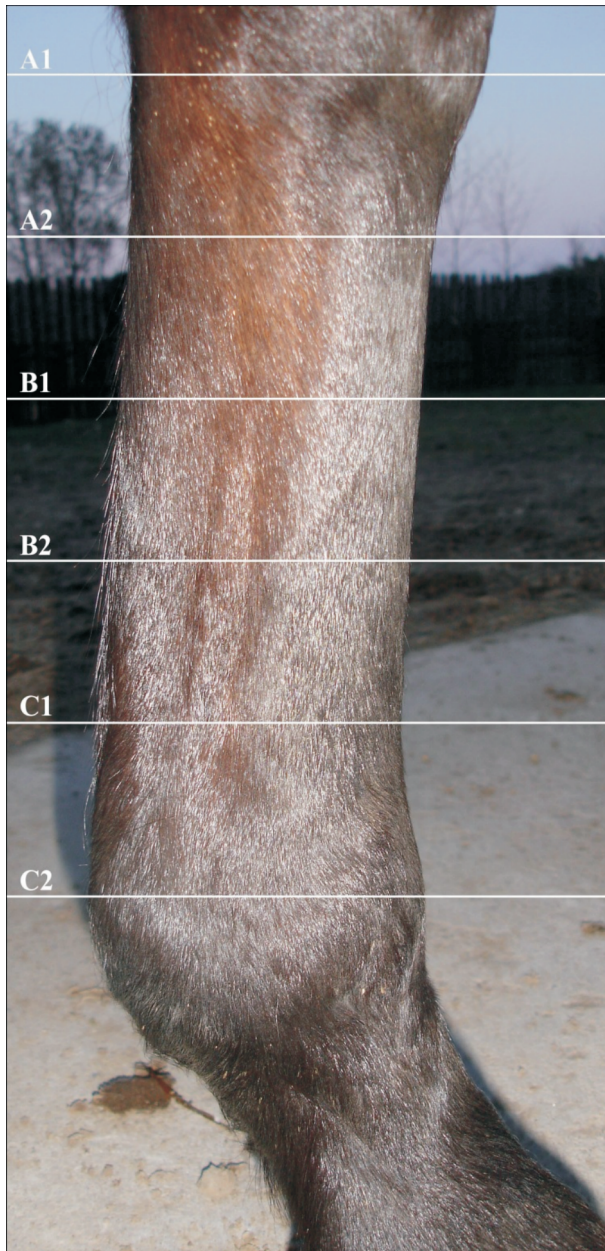


Fig. 1. Division of the metacarpal area into 6 levels.

3. Hypoechoogenic lesion character:
 - 3.1. Transverse cross sectional location of the lesion.

As "lesion" is described here an anechoic or hypoechoic area within the tendon / ligament. Lesions were divided into core, border and diffuse lesions.
 - 3.2. Lesion echogenicity according to Dik classification (Dik 1998).

Lesion echogenicity was classified after Dik into 3 types: hypoechoic (type 2), mostly anechoic (type 3) and completely anechoic (type 4).
 - 3.3. Percentage of Lesion Cross Sectional Area (% Hypoechoic Area:%HYP) and Per-

centage of Total Lesion Cross Sectional Area (% Total Hypoechoic Area:%T-HYP).

At each level the hypoechoic lesion was present, the size of its cross sectional area (Hypoechoic: HYP) was measured and its ratio to the cross sectional area of the tendon at this level (%Hypoechoic:% HYP) was calculated.

To meet the requirements of Genovese categorization, Percentage of Total Lesion Cross Sectional Area (Percentage of Total Hypoechoic:% T-HYP) was calculated dividing the sum of HYP of all levels at which the lesion was present by the sum of tendon CSA at all 6 levels.

- 3.4. Lesion length (Length of Hypoechoic: L-HYP),

The lesion length is the distance between its proximal and its distal border.

4. SDF tendonitis grade according to Genovese.

Horses were classified according to Genovese et al. (1997) scale in 5 categories (Table 1).

Results

Statistics on the whole population of horses training and racing at the Warsaw Racetrack Służewiec

An average of 70.75% of trained Thoroughbreds and 82.58% of trained Arabians went to racing ($P=0.037$). Around 11% of racing Thoroughbreds took part in fence or steeple races (Arabians take part only in flat races). In Arabians, males race more frequently ($P=0.011$): 5.85 race/year in 3yo, 7.25 in 4yo and 7.35 when older, versus 4.87 race/year in 3yo fillies, 6.15 in 4yo and 5.83 in older. Although Thoroughbred fillies were raced somewhat more often than colts (3.02 race/year in 2yo, 6.85 in 3yo and 6.27 in older versus 3.01 race/year in 2yo males, 6.18 in 3yo and 6.08 in older) this difference is statistically insignificant ($P=0.548$).

2yo fillies run on shorter distances and at a slightly higher speed, when mean achieved place is not statistically relevant. Differences in 3yo ones were not statistically significant. It is often thought that fillies do not perform as well as colts, but no sex differences appeared neither in 2yo nor in 3yo ones.

In Thoroughbreds (Table 2) difference in height at withers between fillies and colts is statistically highly significant, both at the age of 2 and 3yo (respectively $P<0.001$ and $P=0.001$) as well as the difference in metacarpal circumference (respectively $P<0.001$ and $P<0.001$). Differences in thoracic circumferences were not significant (respectively $P=0.738$ and $P=0.097$). In Arabians no statistically relevant differences were found in measurements between females and males.

Table 1. Genovese categorization of tendonitis.

Grade	% T-HYP	Echogenicity	%CSA	%T-CSA
2	< 1%	Type 1	> 40%	> 15%
3	1-15%	Type 2	irrelevant	irrelevant
4	1-15%	Type 3 or 4	irrelevant	irrelevant
5	16-25%	Type 2, 3 or 4	irrelevant	irrelevant
6	> 25%	Type 2, 3 or 4	irrelevant	irrelevant

Table 2. Mean \pm s.e. body measurements in 2 and 3 year old Thoroughbreds trained for racing at the Warsaw Racetrack Służewiec.

Mean	Height at withers (cm)		Thoracic circumference (cm)		Metacarpal circumference (cm)	
	2	3	2	3	2	3
Age (years)						
Female	156.33 \pm 0.36	160.05 \pm 0.36	178.43 \pm 0.50	181.46 \pm 0.48	18.95 \pm 0.06	19.26 \pm 0.07
Entire male	158.11 \pm 0.35	161.79 \pm 0.35	178.66 \pm 0.49	182.58 \pm 0.47	19.69 \pm 0.06	19.95 \pm 0.06

Table 3. Mean \pm s.e. body measurements in 2 and 3yo Thoroughbreds that sustained flexor tendons / SL injury.

Mean	Height at withers (cm)		Thoracic circumference (cm)		Metacarpal circumference (cm)	
	2	3	2	3	2	3
Age (years)						
Female	159.14 \pm 0.37	162.54 \pm 0.61	179.78 \pm 0.82	183.25 \pm 0.83	19.25 \pm 0.09	19.61 \pm 0.12
Entire male	160.04 \pm 0.42	163.61 \pm 0.44	179.99 \pm 0.58	184.63 \pm 0.50	19.86 \pm 0.07	20.14 \pm 0.08

Statistics were calculated with Statistical Pack SPSS 12.0. Following statistical tools were used:

- χ^2 test to check proportions,
- Fisher's test to check proportions on small probe groups,
- Mann-Whitney test to check differences between two independent probe groups,
- Kruskal Wallis test to check differences between three or more independent probe groups,
- GLM procedure to define influence of constant factors on features having normal distribution.

not significant (respectively $P=0.738$ and $P=0.097$).

In Arabians no statistically relevant differences were found in measurements between females and males.

Characteristics of injured horses

In the study there were 158 cases of tendonitis in Thoroughbreds and 29 cases in Arabians. In Thoroughbreds, 50 (31.7%) were females, 104 (65.8%) males and 4 (2.5%) were geldings. The gender-related prevalence of tendon injury is clearly demonstrated. 25 cases were recorded in 2yo fillies which is 4.1% of all the females of this age racing between 2001 and 2006 at the Warsaw Racetrack Służewiec, whereas

43 cases were reported in 2yo entire males, representing 8.1% of the male population. The χ^2 test established this difference as highly significant ($P=0.004$). In 3yo the injured fillies constituted 2.4% of the racing female population, whereas colts constituted 5.8% ($P=0.003$). In Arabians, 11 (37.9%) were females and 18 (62.1%) were entire males – this proportion reflects the sex distribution in correspondent age groups – no sex prevalence of tendonitis exists in this breed.

In Thoroughbreds (Table 3) injured horses were taller both as 2 and 3yo (respectively, $P<0.001$ and $P<0.001$), were wider in chest (respectively $P=0.005$ and $P<0.001$) and had a bigger metacarpal circumference as 2yo ($P=0.009$) than the measurements of the whole population. The difference in metacarpal circumference in 3yo ones is not statistically significant ($P=0.071$).

In Arabians there were not statistically important differences in body measurements between injured horses and the whole population.

In Thoroughbreds, 65 horses (41.1%) developed a tendonitis/desmitis before their first race; 93 (58.9%) had raced at least once before injury. 27 (29.0%) of the 93 horses that had raced previously, took part in a fence/steeple race a least once in their life and 21 (22.6%) at least once in the season when they were injured.

Fifty nine horses (37.3%) were injured in a race: 44 in a flat race and 15 in a fence/steeple race. Comparing all Thoroughbreds injured in a race, it was found that these horses reached a higher result (place) in that last race (mean 3.36 ± 0.28) than in previous races in that season (mean 4.10 ± 0.27) ($P=0.031$).

Injury characteristics

In Thoroughbreds 151 (95.57%) horses suffered from flexor tendonitis / SL desmitis in the forelimbs and only 7 (4.43%) in the hindlimbs. In Arabians, in all cases the forelimbs were concerned. Because of the low prevalence of flexor tendonitis / SL desmitis in the hindlimbs, these cases were excluded from further analysis.

In Thoroughbreds the left limb was more affected – 65 cases (43.1%) versus 50 cases (33.1%) concerning the right fore. In 36 cases (23.8%) both limbs were affected. This prevalence is even more marked in horses that have previously raced at least once: 48 cases (53.3%) of left fore tendonitis/desmitis versus 32 cases (35.6%) in the right fore and 10 bilateral cases (11.1%). However, in horses that raced at least once abroad, on a right-handed track (15 cases), both limbs are comparatively affected: 7 cases (46.7%) of left fore versus 8 cases (53.3%) of right fore. The association of previous racing with the prevalence of left / right / bilateral tendonitis/desmitis was evaluated using the χ^2 test and was found to be statistically very significant ($P<0.001$).

In Thoroughbreds the most frequently involved condition was the SDFT: 139 cases (92.0%). There were 11 cases (7.3%) of suspensory desmitis (branches included) and only 1 case (0.7%) of AL-DDFT desmitis. As in Thoroughbreds, most cases in Arabians concerned the SDFT: 24 cases (82.8%), 5 cases (7.2%) involved SL desmitis (branches included). Therefore DDFT and AL-DDFT injuries are excluded from further analysis.

In Thoroughbreds, there is an interesting relation between structure and limb. When SDF tendonitis is mostly a left fore problem (46% versus 29.5% in right fore and 24.5% bilaterally), suspensory desmitis is more often seen in the right fore (72.7% versus 9.1% in the left fore and 18.2% bilaterally). Evaluation performed with the χ^2 test showed the association between those factors as highly significant ($P=0.010$).

To satisfy statistical requirements concerning minimum number of cases, only forelimb SDF tendonitis cases in Thoroughbreds were further investigated. As stated earlier, there were 139 cases of forelimb SDF tendonitis in Thoroughbreds. 27 cases did

not demonstrate signs of a hypoechogenic delimited area and tendonitis was diagnosed based on tendon CSA increase (“grade 2” by Genovese). In 108 Thoroughbreds, there was a hypoechogenic delimited lesion within the tendon: in 96 cases it was a core lesion, in 12 cases – a border lesion. In 2 cases the lesion was diffuse and very large (>65%). In one case the SDFT was completely ruptured and therefore this case will not be investigated further.

21 cases of “grade 2” tendonitis (77.8%) were found in 2yo, 4 (14.8%) were present in 3yo and 2 (5.4%) in horses ≥ 4 yo ($P<0.001$).

Prevalence of tendonitis grade ≥ 3 (with a hypoechogenic lesion) increased with age: it involved 1.73% of all 2yo trained at the Warsaw Racetrack Sluzewiec, 2.88% of 3yo and 3.97% of older than 3years. As the majority, but not all injured animals, were presented to the hospital, it is worth noticing the increase of the percentage of horses with tendonitis grade ≥ 3 in the whole trained population of horses: increase of 66.47% in 3yo and of 129.48% in ≥ 4 yo when compared to 2yo.

When comparing horses that sustained injury in a flat race to those that were injured in a steeple/fence race, differences in lesion length are statistically very significant (17.67 ± 1.25 cm in fence race versus 12.33 ± 0.88 cm in flat race; $P=0.008$). It is surprising, but in horses that sustained injury during a flat race, the distance run did not correlate with an increase in lesion cross-sectional area nor in length.

No statistical difference in race history (had/had not raced previously, frequency of starts that and previous year, injury in training/racing) was found between horses that sustained core and border lesion. Core lesions were generally bigger than border ones (the cross sectional area of core lesion was $22.82 \pm 1.61\%$ and its length 12.74 ± 0.48 cm, versus $10.67 \pm 1.13\%$ and 7.43 ± 0.79 cm). The echogenicity of the lesion did not depend on its localization (core/border).

Horses that have never raced have better (higher) echogenicity of lesions (3.00 ± 0.11) than horses that have raced before (3.17 ± 0.07 , and much better than horses injured in a race (3.22 ± 0.08), especially if injured in a steeple/fence race (3.36 ± 0.14).

The mean tendonitis category according to Genovese increased with age (Table 4) ($P<0.001$).

Outcome

The post-injury race history of 133 Thoroughbreds and 26 Arabians is known.

55 Thoroughbreds out of 133 (41.4%) and only 4 Arabians out of 26 (15.4%) raced at least in one

Table 4. Association between grade of tendonitis and age in Thoroughbreds.

Age (years)	2	3	≥4	Total
Number of cases	55	44	37	136
Mean category	3.24 ± 0.17	4.43 ± 0.20	4.73 ± 0.23	4.03 ± 0.13

race. In Thoroughbreds, 14 out of 44 (31.82%) females, 38 out of 85 (44.71%) entire males and 3 out of 4 (75%) gelding resumed racing.

Post-injury race history of 23 Thoroughbreds with tendonitis grade 2 is known. 14 (60.87%) of them returned to racing. 1 horse ran only 1 race and was retired, when 10 horses (43.48%) performed for at least a full season, this means ≥6 races. A hypoechogenic lesion within the SDFT severely diminished the chances of a horse returning to racing: only 33 horses out of 98 (33.67%) ran at least one race after injury and 13 horses (13.27%) performed for at least a full season (≥ 6 races).

When comparing horses that ran at least two races to those who had not, lesion length was highly important in the outcome of tendonitis ($P < 0.001$). The mean length (\pm s.e.) was of 13.38 ± 0.72 in horses that failed to return to racing, 8.82 ± 0.76 in horses that ran 1 to 5 races post injury and 8.44 ± 1.13 in horses that ran over 6 races. The outcome depending on lesion length is presented in Table 5.

Table 5. Classification of outcome depending on lesion length.

Lesion length	Returned to racing?		Total
	yes	no	
1-8 cm	20 51.3%	19 48.7%	39 39.8%
9-12 cm	9 42.9%	12 57.1%	21 21.4%
≥ 13 cm	4 10.5%	34 89.5%	38 38.8%
Total	33 100.0%	65 100.0%	98 100.0%

The cross-sectional area had very little correlation with returning to racing ($P = 0.375$). Nevertheless, when comparing the number of races run after injury in horses that did return to racing, both lesion length and cross-sectional area are highly important ($P < 0.001$).

No statistical differences were found in outcome between horses that sustained border and core lesion: respectively 27.3% and 30.3% ($P = 0.570$). Echogenicity of the lesion had an important impact on the out-

come ($P < 0.001$): 26,3% of horses with lesion echogenicity grade 2 failed coming back to race and 73.3% of horses with grade 3 or 4!

Genovese categorization (Tab. 6) is also valuable in assessing the return to racing ($P = 0.004$); however, its sensitivity is not higher than measurements of lesion length and evaluation of lesion echogenicity, which is easier in everyday practice.

Table 6. Outcome depending on Genovese Categorization..

Tendonitis grade	Returned to racing?		Total
	yes	no	
2	14 60.9%	9 39.1%	23 100.0%
3	14 46.7%	16 53.3%	30 100.0%
4	6 46.2%	7 53.8%	13 100.0%
5	7 30.4%	16 69.6%	23 100.0%
6	7 25.0%	21 75.0%	28 100.0%
Total	48 41.0%	69 59.0%	117 100.0%

Discussion

An average of 70.75% of trained Thoroughbreds and 82.58% of trained Arabians went on to racing. As the main causes of non racing a trained horse are medical problems (predominantly orthopedic), it can be deduced that Arabians are generally sounder than Thoroughbreds. Thoroughbreds are also at higher risk of tendon injuries, as they constituted 84.49% of the injured horses, when being only 64.45% of the population of racehorses trained at the Warsaw Racetrack. The factors predisposing them to injuries are higher body height (and weight) and fence/steeple races.

In Thoroughbreds, the study clearly demonstrated effect of body measurements on tendonitis prevalence. Injured horses were approximately 2 cm higher and had a bigger thoracic circumference of about 1.5 cm than the average in the same sex and age group. Whereas the height of the horse is its genetic feature, its weight can be – and surely should be – thoroughly monitored.

At the Warsaw Racetrack, there is a higher prevalence of tendon injuries in Thoroughbred males than in females, which is in accord with results of Estberg et al. (1998) and Kasashima et al. (2004) and this prevalence is clearly seen in all age groups. However, the explanation that this is due to the fact that fillies race less frequently is not true in the Warsaw Racetrack. What more, in Arabians where fillies indeed race less frequently, the male prevalence of tendonitis does not exist. One of the factors that can predispose Thoroughbreds males to tendonitis is their size and weight. In the general population of trained horses, 2yo males are 1.78 cm, and 3yo 1.74 cm higher than females of the same age, which is statistically very important. It is interesting to notice, that those results are very similar to height differences between injured Thoroughbreds and the whole population in corresponding sex and age groups. Arabian racehorses, where the prevalence of tendonitis in males is not significant and in which height and thoracic circumference are not statistically different between both sexes, confirm the importance of these factors.

It is interesting that in all groups of Thoroughbreds injured during a race, their place in this race was better than the average place in this year.

Results obtained in this study show clearly that fence and steeple races increase severely the chances of tendon injury as well as its severity – the lesion cross-sectional area and its length have much higher values in horses injured in fence/steeple race when comparing with flat races. Several causes should be taken in count, of which the landing of fences and higher weight of jockeys seems to be the most important. Both these factors increase considerably hyperextension of the fetlock joint, which combined with flexion of the coffin joint lead to overstrain of the superficial flexor tendon and SL.

In opposition to Hong-Kong studies (Lam et al. 2007), where horses race clockwise direction and as in the American studies of Genovese et al. (1997), Thoroughbreds in the present study had a higher prevalence of SDF tendonitis in the left fore, and this prevalence was even increased in horses that had raced at least once. As on the Warsaw Racetrack Sluzewiec horses run anti-clockwise, and as horses that had run at least once before injury on a clockwise track had equal numbers of tendonitis in left and right fore, this confirm the theory that inside fore is more exposed to SDF tendonitis. The inside fore is also most frequently the lead leg (Parkin et al. 2006a). The prevalence of inside forelimb SDF tendonitis does not seem to be just a loading consequence: McGuigan and Wilson (2003) calculated in their study that ground reaction force is greater in the nonlead limb at canter and predicted that it would be also bigger at higher

speeds. Therefore further biomechanical studies should be carried out to explain strain increase in the inside limb SDFT on turns. The present study showed additionally a higher prevalence of right fore suspensory desmitis, which means external and non-lead limb. This point was not mentioned in any study known to the author, but seems logical, as it is well known that horses with a suspensory desmitis are generally lamer on the opposite hand. These limb prevalence seems very important when building a training program for horses with subclinical changes or in reeducation after injury. It should be profitable for horses that sustain a SDF tendonitis to do speed work on the opposite leg. In contrary, horses which sustained a suspensory desmitis should be rather worked on corresponding hand.

Fifty five Thoroughbreds out of 133 (41.4%) and only 4 Arabians out of 26 (15.4%) raced at least in one race after injury. The outcome in Thoroughbreds is similar to previous studies: 37% as found by Marr et al. (1993) and 37% in flat racehorses and 43% in National Hunt racehorses as found by Dyson (1997). No data on the outcome of tendonitis/desmitis in Arabian racehorses were published before.

The outcome of “juvenile tendonitis” was much better (60.87% of coming back to racing) than of tendonitis with hypoechogenic lesion (33.67%). In addition, a successful career (≥ 6 races) after injury is much more probable in tendonitis grade 2 (43.48%) than grade ≥ 3 (13.27%).

Genovese categorization is known to be a useful tool in predicting the chances of returning to racing. The present study confirmed this, with 46.51% of horses of category 3 or 4 coming back to racing and only 27.45% of those with category 5 and 6. However, in everyday practice Genovese classification requires much time. Therefore, parameters evaluated in a routine exam have great value. The cross-sectional area of the hypoechogenic lesion is the parameter most used describing the tendonitis severity. The author was therefore surprised that its impact on the outcome was weaker than hypoechogenic lesion length, even though both are strictly correlated: it is obvious, that larger lesions tend to be also longer ones. In the present study 51.3% of horses with L-HYP ≤ 8 cm (less than 2 probe lengths) returned to racing, 42.9% with L-HYP between 9 and 12 cm and only 10.5% of horses with L-HYP over 12 cm!

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