Owner reported clinical signs and treatment decisions in equine pastern dermatitis

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Klinische Anzeichen und Behandlungsentscheidungen bei Mauke

Mauke hat eine hohe Prävalenz in der Pferdehaltung, insbesondere bei Kaltblutpferden. Die Therapie dieser Hauterkrankung gestaltet sich schwierig, und vermutlich entscheiden sich Besitzer oft für eine Behandlung ohne einen Tierarzt zu konsultieren. Die Ziele der vorliegenden Studie waren die klinische Beschreibung der Hautveränderungen durch die Besitzer, den Schweregrad und die Entscheidungsgrundlage einen Tierarzt zu konsultieren abzuklären. Zusätzlich wurden die Prophylaxe und Behandlungen durch Besitzer mit oder ohne tierärztliche Konsultation abgefragt.

Insgesamt wurden die Daten von 123 Pferden (Besitzer über soziale Medien rekrutiert) analysiert. Alle Pferde erkrankten mindestens einmal in den zwei Studienjahren an Mauke. Die Resultate wurden mit standardisierten Fragebögen zu Management, Haltungsbedingungen, klinischen Symptomen sowie vorbeugenden Massnahmen und Behandlungen gesammelt. Die Daten wurden mittels deskriptiver Statistik dargestellt.

Die meisten Pferde (71 von 115 verfügbaren Antworten, 62 %) hatten mindestens viermal in ihrem Leben klinische Anzeichen einer Mauke. Insgesamt 113 Pferde (113/123, 92 %) waren zum Zeitpunkt der Befragung an Mauke erkrankt. Bei 37 Pferden (37/114, 32 %) konsultierten die Besitzer ihren Tierarzt erst, nachdem das Pferd Anzeichen von Schmerzen oder Lahmheit zeigte. Behandlungen, die keiner tierärztlichen Verordnung bedurften, wurden in der Regel ohne Rücksprache mit dem Tierarzt durchgeführt (z. B. nur 9 % (14 /150) der topischen wundheilungsfördernden Cremes wurden von einem Tierarzt verschrieben). Insgesamt 31 Behandlungsentscheidungen (55 %) mit Cremes mit antibakteriellen, antimykotischen und/oder entzündungshemmenden Wirkstoffen und 100 % systemische Medikamente mit antibakteriellen, antiparasitären oder entzündungshemmenden Wirkstoffen wurden von Tierärzten verschrieben. 69 % der Behandlungen

Summary

Equine pastern dermatitis has a high prevalence in the equine population, especially in draft breeds. This skin condition is difficult to treat, and it is suspected that owners often decide on a treatment without consulting a veterinarian. The objectives of this study were to describe owner-reported clinical signs, severity, and reasons to consult a veterinarian. Moreover, we inquired about preventive measures and treatments, both instituted by owners without previous consultation or prescribed by their veterinarians.

A total of 123 horses (owners recruited over social media) were included in the study. All horses suffered from equine pastern dermatitis at least once in the two years preceding the study. Standardized questionnaires collecting information on management, housing conditions, clinical signs as well as preventive measures and treatments were filled out by participants. The data was recorded, and descriptive statistics were performed.

Most horses (71 out of 115 available answers, 62 %) had shown clinical signs of equine pastern dermatitis at least four times in their lives. A total of 113 horses (92 % of all included horses) were affected by equine pastern dermatitis at the time of the interview. For 37 horses (32 %) out of 114 available answers the owners consulted their veterinarian only after the horse showed signs of pain or lameness. Usually, treatments that did not require a medical prescription were applied without consulting their veterinarian (e. g. only 9 % (14 out of 150 prescriptions) of topical creams promoting wound healing were prescribed by a veterinarian). A total of 31 treatment decisions (55 %) with creams containing anti-bacterial, anti-mycotic and/or anti-inflammatory agents and 100 % of systemic medications containing anti-bacterial, anti-parasitic or anti-inflammatory agents were prescribed by veterinarians. Overall, 69 % of treatment decisions were made without consulting a veterinarian, making it then more difficult to determine underlying causes for the pastern dermatitis and rendering the treat-

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wurden ohne Rücksprache mit einem Tierarzt durchgeführt, welche die Bestimmung der Ursache oft schwieriger und die Behandlung der Mauke länger und belastender macht. Informationskampagnen sind für das Tierwohl notwendig, damit Besitzer die Vorteile einer frühen Konsultation eines Tierarztes erkennen.

Schlüsselwörter: Pferd, vom Besitzer gemeldete klinische Anzeichen, Mauke, Behandlung

ment often longer and more onerous. To raise owner awareness of possible consequences if a veterinarian is consulted too late in the disease process, specific information campaigns to improve animal welfare should be considered.

Keywords: Horse, owner-reported clinical signs, pastern dermatitis, treatment

Introduction

Rather than a specific disease entity, equine pastern dermatitis (EPD) is considered a multifactorial syndrome manifesting as a cutaneous inflammatory reaction pattern in the palmar/ plantar area of the pastern.[7,19,27] EPD is more commonly seen on pelvic limbs and unpigmented legs,[4,7,21,27] is often recurrent and genetic factors can favor its development.[11,12] Draft breeds are more frequently and more severely affected than other breeds,[5,11,12,25] but external environmental factors like damp conditions or poor hygiene are also thought to play a role.[19,27] Infectious agents that may be involved in EPD include Chorioptes mites and other parasites, bacterial infections, in particular *Staphylococcus spp.*,[6,18] while a role for *Dermatophilus congolensis* and dermatophytes in EPD could not be confirmed in one study with this specific focus.[2] These infectious agents may be primary causes for the clinical signs or occur secondarily and act as perpetuating factors.[27] Non-infectious factors besides wet, muddy and unhygienic environments, are physical or chemical irritants (e.g. treated bedding/ shavings, sandy soil, primary irritant contact dermatitis to shampoos or lotions, tack and training devices etc.) or immune-mediated reactions.[14,21,27]

Clinical signs vary from mild to severe and in some cases the lesions can spread dorsally and/ or proximally.[21,27] The clinical presentation of the mildest form comprises erythema, dry scales, and edema.[14,21,27] This can then progress to a more severe form including exudations, alopecia, and erosions.[14,19,27] In even more chronic states, the skin becomes hyperkeratotic and fissured.[19,21,27] Pain at palpation might be present[19,21,27] and a possible complication is the development of cellulitis.[14] In some cases, affected horses show obvious lameness.[14,19,21,27] Due to the wide range of clinical presentations and of potential risk factors, identifying the underlying causes and factors contributing to EPD can be challenging.[7,19,27] Many differential diagnoses need to be considered, such as leucocytoclastic pastern vasculitis, dermatophytosis, dermatophilosis as well as a primary or secondary photosensitization.[7,14,19,21,27] Because of the many factors potentially contributing to EPD, management of this syndrome can be frustrating and in some advanced cases, with chronic thickening of the skin, complete resolution of the clinical signs cannot be achieved.[14,19,27]

EPD is one of the most frequent dermatological conditions in Swiss warmblood horses[1] and this is in striking contrast to the scarcity of peer-reviewed publications on the disorder, making diagnostic and therapeutic decisions difficult, even for trained veterinarians. We suspect that owners often decide on a treatment course before consulting a veterinarian. Inadequate therapeutic choices without having established a professional diagnosis of the underlying causes may lead to incomplete resolution and a protracted course of the condition,[7,14,27] which in turn results in a poorer welfare. Therefore, it is important to investigate how owners of affected horses assess the severity of EPD, when and if they search for professional advice, which treatments they administer, and which preventive measures they use.

Accordingly, the aims of this descriptive study were to portray owner-reported clinical signs, severity, and reasons to consult a veterinarian. Moreover, we inquired about preventive measures and treatments, both instituted by owners without previous consultation and those prescribed by their veterinarians.

Materials and Methods

A standardized questionnaire was used to collect information on management, housing conditions and clinical signs associated with EPD as well as preventative measures and treatments used in affected horses. The questionnaire was previewed and screened by three veterinarians (authors SO, SKT, VG), and three horse owners to validate the content and clarity of the questions. Data collection was carried out between January and September 2019. Informed consent of all participants was obtained prior to data collection.

Case selection and population

A call for participation in the study was posted on social media, and furthermore, databases (clinical informa-

tion system and previous research projects) of the Swiss Institute of Equine Medicine (ISME) were also used to recruit and contact owners of horses with EPD. The target group was defined as owners of horses that had shown clinical signs of EPD at least once in the two years preceding the interview. Horses without clinical signs in the last two years were excluded.

Questionnaire

Owners received and returned the completed questionnaire by email through the first (SO) or second author (SKT). The questionnaire was divided into three parts and contained mainly closed ended questions. Open-ended questions allowing for free written responses were included only where appropriate. The first part focused on the signalment, housing conditions and medical history (other than EPD) of the horse, the second part recorded information on past and present clinical signs of EPD and the third part recorded preventative measures and treatments used in the two years prior to the study. The original questionnaires in German and French are available online (Link Manuskript auf SAT Webseite: Appendix 1).

Horse signalment: Age, breed, sex, coat color and white markings on the legs as well as duration of ownership were recorded.

Daily management: Type of housing, bedding, frequency of turnout and work performed by the horse (e. g. riding or other training practice); the surface material of the turnout and riding/training areas, use of protective leg equipment (e. g. boots or bandages) as well as the feeding routine for roughage and concentrate were recorded.

General health care and status: Information about general preventive measures (vaccination, deworming), use of insect repellents as well as other known diseases and disorders of the horse were collected.

EPD – past episodes: The owners were asked how many times they had observed clinical signs of EPD, at which age these signs appeared for the first time and how severe they would grade the signs on a scale of 1 (mild) to 5 (very severe). In addition, they were asked to document which legs were affected in the past and whether this was consistent or changing. Finally, it was established whether a veterinarian had been consulted for the EPD affliction.

EPD – current presentation: Owners were asked to record which legs were affected and the associated clinical signs. Again, they were asked to grade these signs on a scale of 1 (mild) to 5 (very severe). Owners with horses not exhibiting signs of EPD at the time of the interview were asked to omit questions related to «current presentation».

EPD – treatment and preventive measures: Participants were asked if they had treated the condition and were offered predefined answers for both local and systemic medical treatment (disinfection, antibiotic, fungicidal, antiparasitic, anti-inflammatory), non-medical management measures (changes in detention, clipping of the feathers or other measures) and an option to provide information on other treatments and measures not included in the predefined choices. Owners were also asked if they consistently used the same treatments or if they changed them and at which point and according to which criteria, they decided to involve a veterinarian. In a separate questionnaire, medications were recorded more specifically (product names, period of application, dosage and application rate) for a period of up to 24 months before completion of the questionnaire. Participants had to specify whether the treatment was used topically or systemically, and whether the medication was prescribed by a veterinarian.

Statistical analyses

Data were recorded and compiled in a spreadsheet (Microsoft Excel) and analyzed using Python[10] scripts, packages Pandas (version 1.0.5),[10,22] Seaborn (version 0.10.1),[26] Statsmodels (version 0.11.1)[20] and Scipy (version 1.5.0).[24] Counts and percentages and where appropriate median and 95 % confidence intervals [CI] are provided. As not all participants replied to all questions, percentages were calculated relative to the total number of available answers for each question. The breeds were broadly grouped into four categories: warmblood, draft breeds, franches-montagnes and others. The specific medical treatments and products were broadly grouped into categories: topical (antiseptic, antibiotic, anti-inflammatory, fungicide, antiparasitic and other) and systemic (antibiotic, anti-inflammatory, antiparasitic and other). Owner reported severity was first visualized using histograms and checked for normality using a Shapiro-Wilk test.

Results

A total of 123 questionnaires completed by 92 owners met the inclusion criteria and were used in the descriptive analyses. The same questionnaire was used for a field study conducted independently, in which 80 horses were included.[6] Eight owners (9 % of all owners) completed questionnaires for several horses, with the maximum per owner being twelve questionnaires. A total of 16 stables housed more than one horse (range: 2-12 horses) for which a questionnaire was completed (by the same or by different owners) resulting in 83

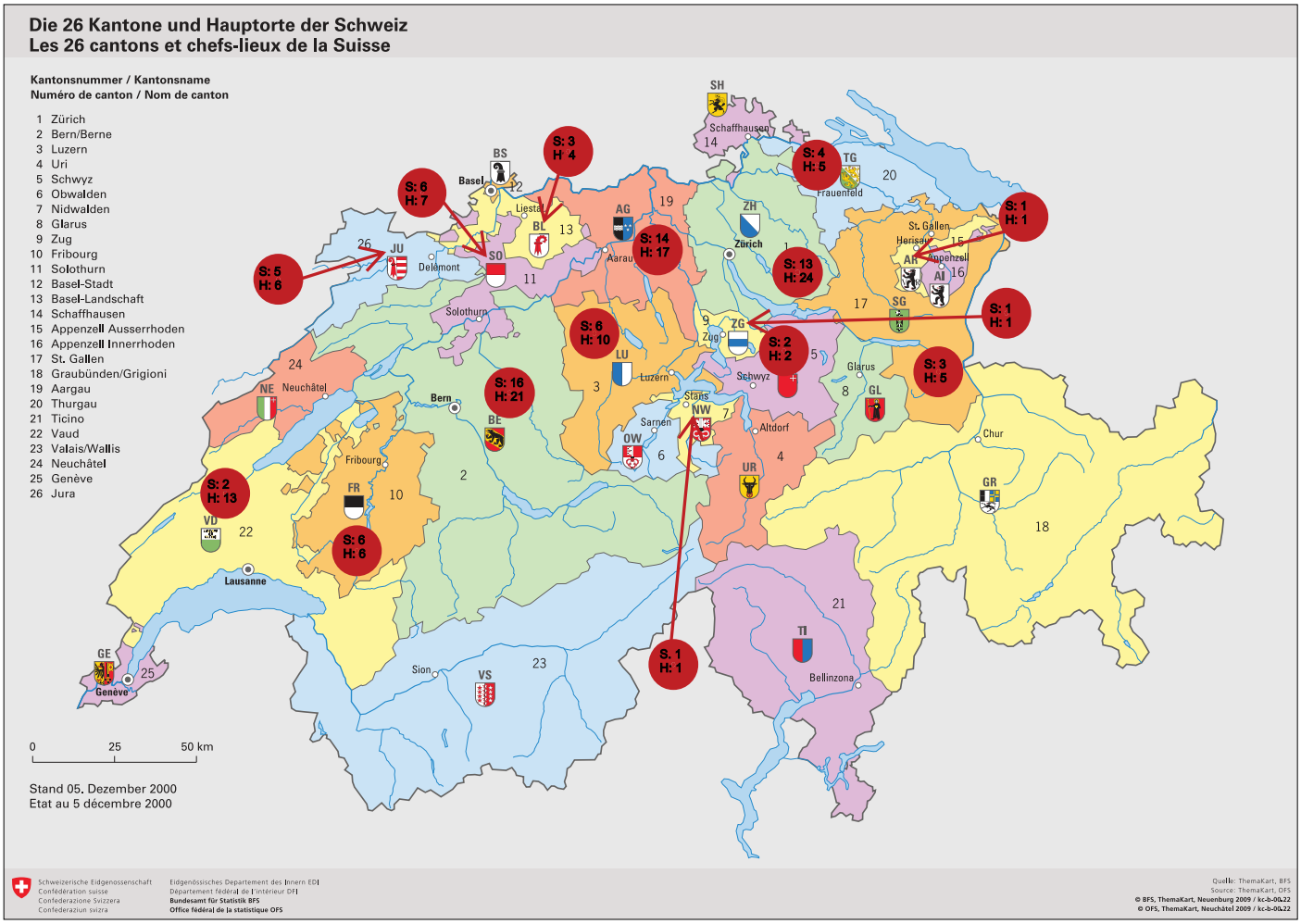

Figure 1: Regional distribution stables included in a study on owner reported clinical signs and treatment decisions in equine pastern dermatitis. Abbr: S = number of stables H = number of Horses. Source of basemap: Bundesamt für Statistik, ThemaKart, Neuenburg 2009 / kc-b-00.22; https://www.bfs.admin.ch/bfs/de/home/statistiken/kataloge-datenbanken/karten.assetdetail.1031487.html

Table 1: Signalments of horses (n=123) involved in a study on owner reported clinical signs and treatment decisions of equine pastern dermatitis. The breeds are compared to the Swiss equine population (data from Identitas[23] as of December 2019).

	Median (range)	Number of horses (n=123)	Comparison to Swiss Population (%)
Age	11 years (2-27 years)		
Sex			
stallion		17	
gelding		56	
mare		50	
Breed			
draft breed		43	1,8% (~ 2400 draft breeds)
warmblood		39	0,1% (~ 34200 warm blood)
franche-montagne		23	0,1% (~ 18300 franche-montagne)
other		18	0,05% (~35500 «other» breeds)
Coat color			
bay		55	
chestnut		25	
black		23	
pinto		15	
grey		5	

different stables being investigated. The regional distribution of participating owners and the stables can be seen in Figure 1. Most horses (24 horses [19 %] in 13 different stables [16 %]) were housed in the canton of Zürich. A total of 21 horses (17 %) were housed in 16 different stables (19 %) in the canton of Bern.

Horse signalment

The characteristics of the horses are summarized in Table 1. The median age of participating horses was 11 years (range: 2-27 years, 95 % CI: 10 – 13). A total of 43 (35 %) horses belonged to draft breeds and 39 (32 %) were warmbloods. White markings were distributed similarly on left (36 %) and right front legs (37 %) as well as left (63 %) and right hind legs (60 %). Horses had been owned for less than one year to 22 years, 20 participants did not specify since when they owned the horse. The median duration of ownership was 6 years (range: <1 to 22 years, 95 % CI: 5 – 8).

Daily management

Housing details and daily management are summarized in Table 2. A total of 44 horses (36 %) were kept in an indoor box stall, 37 horses (30 %) in a box stall with direct access to a paddock, 35 horses (28 %) in group housing and seven horses (6 %) were permanently kept on pasture with a shelter. All horses had access to pasture, most of them daily (98 %).

General health

Most horses (n = 109, 89 %) were vaccinated and dewormed (n = 111, 90 %) and most participants used

Table 2: Housing details and daily management of horses (n=123) involved in a study on owner reported clinical signs and treatment decisions of equine pastern dermatitis.

Details of treatment administered and prescription (veterinarian or owner)				
	Decision of treatment			
	Veterinarian	Owner	Unknown	Total
Antiseptic (topical)	**31 (41 %)**	**37 (49 %)**	**8 (10 %)**	**76**
Chlorhexidine	12	14	2	28
Povidone iodine	10	16	4	30
Other	9	7	2	18
Antibiotic (topical)	**2**	**2**	**0**	**4**
Tetrazykline	2	0	0	2
Sulfonilamid	0	2	0	2
Anti-inflammatory (topical)	**0**	**1**	**0**	**1**
Clobethasol	0	1	0	1
Fungicide (topical)	**2**	**3**	**0**	**5**
Miconazole	1	3	0	4
Enilconazole	1	0	0	1
Topical combination (antibiotic, anti-inflammatory and fungicide)	**18 (69 %)**	**8 (31 %)**	**0**	**26**
Neomycin, Thiostrepton, Triamcinolon, Nystatin	16	5	0	21
Gramacidine, Neomycin, Fluocinonid, Nystatin	0	1	0	1
Polymixine, Prednisolon, Miconazol	2	0	0	2
Gentamicine, Bethamethason, Clotrimazole	0	2	0	2
Topical combination (antibiotic and anti-inflammatory)	**8 (73 %)**	**3 (27 %)**	**0**	**11**
Neomycin, Dexamethason	8	2	0	10
Chloramphenicol, Prednisolon	0	1	0	1
Anti-parasitic (topical)	**1**	**4**	**4**	**9**
Permethrin	0	3	0	3
Phoxime	1	1	4	6
Promoting wound healing (topical)	**14 (9 %)**	**126 (84 %)**	**10 (7 %)**	**150**
Zinc-oxid	10	40	4	54
Dexpanthenol	0	12	0	12
Colloidal silver	0	12	1	13
Honey	3	44	4	51
Talcum	0	15	0	15
Other	1	3	1	5

Details of treatment administered and prescription (veterinarian or owner)				
	Decision of treatment			
	Veterinarian	Owner	Unknown	Total
Other / herbal (topical)	**24 (12 %)**	**169 (85 %)**	**6 (3 %)**	**199**
Cocosoil	0	38	1	39
Linseed	0	2	0	2
Cream, unknow or mixed herbal active ingredient	19	64	3	86
Shampoo	0	7	1	8
Essential oils	5	14	0	19
Marigold	0	28	0	28
Camilosan	0	3	0	3
Effective microorganism (EM)	0	5	1	6
Sulfur	0	8	0	8
Systemic antibiotic	**8**	**0**	**0**	**8**
Trimethoprim-sulfonamide	6	0	0	6
Sulfonamide	1	0	0	1
Cefquinom	1	0	0	1
Systemic anti-inflammatory	**8**	**0**	**1**	**9**
Corticosteroid	5	0	1	6
Vedaprofen	1	0	0	1
Ketoprofen	1	0	0	1
Phenylbutazone	1	0	0	1
Systemic anti-parasitic	**7**	**0**	**0**	**7**
Ivermectin	6	0	0	6
Doramectin	1	0	0	1
Other systemic products	**4 (18 %)**	**12 (55 %)**	**6 (27 %)**	**22**
Supplements (zinc, sulfur)	1	6	5	12
Herbs	2	2	1	5
Homeopathics	0	4	0	4
Parapoxvirus ovis	1	0	0	1
Total of treatments	**127 (24 %)**	**365 (69 %)**	**35 (7 %)**	**527**

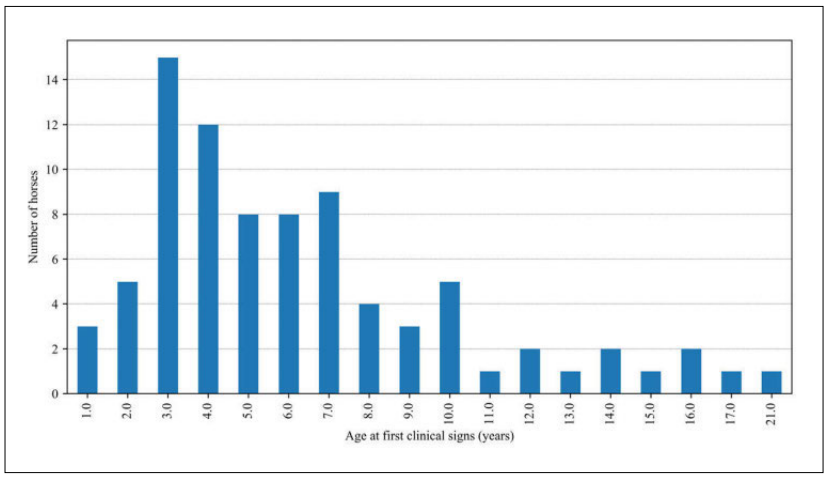

Figure 2: Age distribution of horses with equine pastern dermatitis (EPD) when the first clinical signs appeared. This information was available for 83 horses.

insect repellents (n = 82, 67 %). Of the participants who used insect repellent, most (n = 55, 67 %) applied it to the whole horse. A total of 31 horses were suffering from other diseases. In total, 75 participants (61 %) stated that other horses with EPD were present in the same stable.

EPD – general observations and past episodes

A total of eight questionnaires did not contain information on the frequency of clinical signs of EPD. Of the remaining 115 questionnaires, most stated that horses had shown clinical signs of EPD at least four times in their lives (n = 71, 62 %) and 25 of them (21 %), only once. The age at which clinical signs of EPD first appeared (answers for 83 horses available) ranged from 1 to 21 years (median 5 years, 95 % CI 4-6) and the distribution can be seen in Figure 2. The disease was considered to be constantly present in 34 horses (40 %) and in only 9 horses (11 %) was it considered as the first occurrence of the disease. The duration of the last EPD

occurrence ranged from 1 to 52 weeks (data available for 31 horses, median 4 weeks, 95 % CI 4 – 8).

A seasonality for the occurrence of the disease was not apparent (results not shown). The distribution of severity (Figure 3) of EPD in the past was not-normally distributed (Shapiro-Wilk test, p-value= <0,01) with a mode on severity grade 3 and a median of 3. The proportion of affected pelvic legs was 86 % (left) and 84 % (right) and the proportion of affected thoracic legs was 42 % (left) and 38 % (right). A total of 61 % of owners stated, that exactly the same legs were affected at each occurrence (data available for 120 horses). Of the 123 questionnaires, 12 did not specify whether a veterinarian was consulted to diagnose the disease. Of the remaining 111 horses, 65 % (72 horses) had been diagnosed with EPD by a veterinarian.

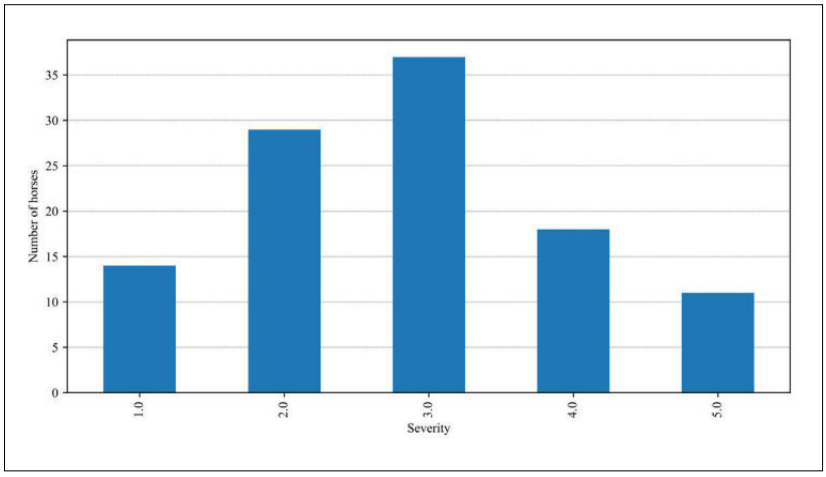

Figure 3: Distribution of owner-estimated-severity of equine pastern dermatitis (EPD) in past episodes. This information was available for 109 horses.

EPD – current presentations

A total of 113 horses were affected by EPD at the time of the interview. The proportion of affected pelvic legs was 74 % (left) and 75 % (right), whereas the proportion of affected thoracic legs was 35 % (left and right). Severity showed a non-normal skewed distribution (Shapiro-Wilk test, p-value=<0,01) with a mode at grade 2, and a median of 2. The distribution of clinical signs (Figure 4) showed that 90 % (102 horses) of the study population had crusts and very few (3, 3 %) were lame. Scales, thickened skin, and ulceration were also often present. Horses with one to three clinical signs were more often assigned a severity grade of 1 to 3, horses with four to six clinical signs were more often assigned a severity grade of up to 4 and horses with seven and eight clinical signs a severity grade of up to 5. An increasing trend of the median severity with the number of clinical signs can be appreciated in Figure 5. No single clinical sign appeared to increase with a higher severity grade.

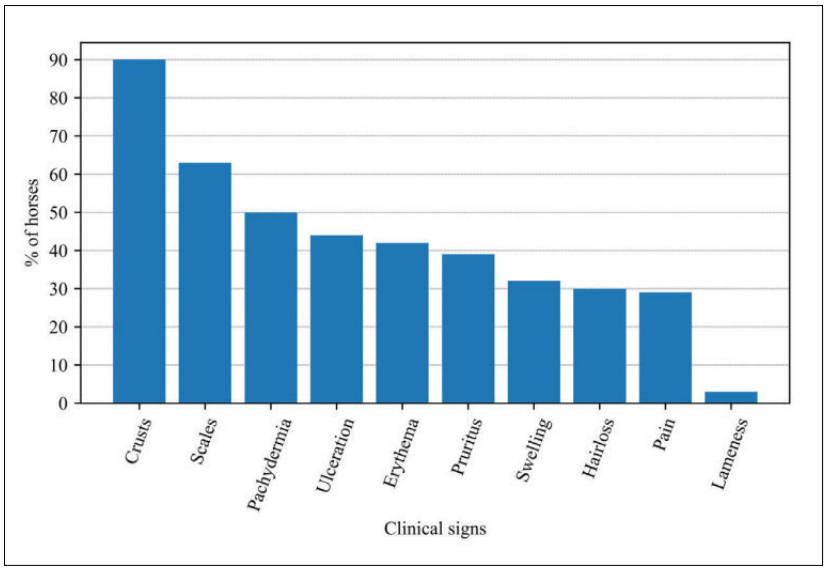

Figure 4: Distribution of the different clinical signs exhibited by horses with equine pastern dermatitis (EPD). All horses exhibiting EPD at the time of the study were included (113 horses).

EPD – prevention measures and consulting a veterinarian

Few horses with clinical signs of EPD were examined by a veterinarian for this EPD occurrence (30 horses, 27 %). General management changes were used as a preventive measure on 27 horses (22 %) and the feathers of 79 horses (64 %) were clipped. The majority of horses (n = 92, 75 %) were treated with the same treatment protocol over time. A total of nine questionnaires did not contain information about the time point at which a veterinarian was called when the horse showed clinical signs. Of the remaining 114 questionnaires, most (n = 37, 32 %) stated that a veterinarian was called when the horses seemed painful of showed signs of lameness, 21 (18 %) when the first crusts appeared, 20 (18 %) reported that a veterinarian was never called and 15 (13 %) only when the owner's own treatment did not improve clinical signs.

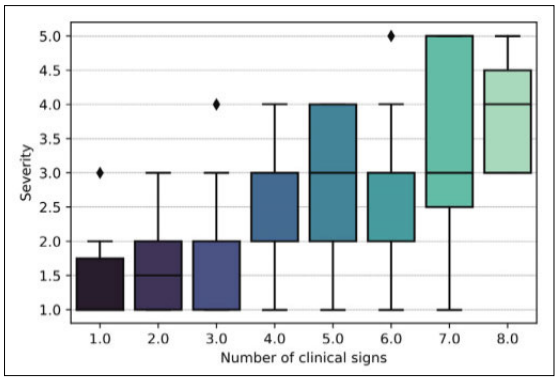

Figure 5: Box-Plots of the owner assessed severity of equine pastern dermatitis (EPD) increasing with the number of clinical signs. Box-Plot Whiskers are drawn as 1,5*IQR and outliers as 3*IQR. All horses with EPD at the time of the study were included (113 horses).

Table 3: Details of the administered treatments for equine pastern dermatitis and whether these were prescribed by the owner or the veterinarian.

Summary of housing and daily management	
Item	**Population**
Bedding	123
Straw	67 (54%)
Shavings	9 (7%)
Other	27 (22%)
Several	20 (16%)
Duration of turn out	122
0-1h	5 (4%)
1-4h	26 (21%)
4-12h	45 (37%)
>12h	46 (38%)
Soil of turn out	121
Gras	35 (29%)
Sand	21 (17%)
Several	36 (30%)
Other	29 (24%)
Training	115
Leisure riding	90 (78,3%)
Dressage	41 (35,7%)
Show jumping	28 (24,3%)
Eventing	6 (5,2%)
Endurance	1 (0,8%)
Trail	4 (3,5%)
Western	8 (6,9%)
Driving	23 (20%)
Protection	115
No protection	50 (43,5%)
Front - several	22 (19,1%)
Front boots	40 (34,8%)
Front bell boots	2 (1,7%)
Front bandages	1 (0,8%)
Hind none	34 (29,6%)
Hind - several	3 (2,6%)
Hind boots	26 (22,6%)
Hind bell boots	0 (0%)
Hind bandages	1 (0,8%)
Training surface	111
Forest	12 (11%)
Gras	6 (5%)
Sand	62 (56%)
Several	26 (23%)
Other	5 (5%)
Feeding roughage	123
Several roughage	102 (82,9%)
Hay dry	21 (17,1%)

Summary of housing and daily management	
Item	**Population**
Frequency roughage	123
1x / day	2 (1,6%)
2x / day	39 (31,7%)
3x / day	42 (34,1%)
4x or more	40 (32,5%)
Feeding concentrate	123
None	20 (16,3%)
Several concentrate	13 (10,6%)
Compound	56 (45,5%)
Barley	3 (2,4%)
Maize	5 (4,1%)
Oats	10 (8,1%)
Other	16 (13,0%)
Frequency concentrate	103
1x / day	42 (40,8%)
2x / day	45 (43,7%)
3x / day	16 (15,5%)
4x or more	0
Amount concentrate	103
<1L	53 (51,5%)
1-3L	44 (41,7%)
3-5L	6 (5,8%)
Performance adjusted	102
Yes	77 (75,5%)
No	25 (24,5%)

EPD – treatments detailed

Out of 123 horses, 102 (83%) had been treated at least once in the 24 months before the study was completed. Out of the 113 horses with clinical signs at the time of the study, 89 (78%) had been treated in the month before the interview. Details of treatments administered can be seen in Table 3. Treatment that did not require a medical prescription and that we categorized as «other treatments» (such as coconut, linseed or essential oils) were most often used by owners without veterinary consultation, followed by wound creams containing dexpanthenol or zinc-oxide. In contrast, creams containing anti-bacterial, anti-mycotic and/or anti-inflammatory agents were usually prescribed by veterinarians. Systemic medications (antibiotics, anti-inflammatory agents) were only prescribed by veterinarians. Overall, 69% of the treatment decisions were made by the owner without consulting a veterinarian.

Discussion

This descriptive study in Swiss horses offers new insights on owner reported occurrence, severity, and clinical signs of EPD as well as on treatments and preventive measures used by owners of affected horses. It also shows that owners often consulted their veterinarian only after the horse showed signs of pain or lameness. Consequently, medication with active ingredients and systemic medication were prescribed by veterinarians only when the EPD was at an advanced or even chronic state.

Many owners reported that their horse had shown clinical signs of EPD at least four times in their lives and / or that clinical signs were constantly present, which is consistent with the reported chronic and recurrent nature of EPD[7,19,21,27] without a clear seasonal pattern. Only one study has proposed a tendency for more apparent clinical signs in spring and autumn,[14] but the present findings do not indicate a clear seasonality of EPD. Reasons for this might be, that seasonality was formulated as an open-ended question. Therefore, some answers could not be grouped into a season (e.g 'during wet periods') and for some horses more than one season was defined by the owners.

We found that crusts and dry scales were frequently reported clinical signs of EPD. These signs have been reported to occur at an early stage of disease[14,21,27] and are visible even if the pastern area is not clipped. This facilitates disease detection, provided that the owner is aware of the disease. The least frequently reported clinical sign was lameness, which is an infrequent complication of EPD, often appearing acutely with cellulitis.[14,19,21,27] While the severity grading seemed to increase with the total number of simultaneously occurring clinical signs, no specific type of lesion or sign appeared to be associated with higher grades. To help owners of horses with EPD to assess the severity of the disease more objectively, a future study could aim to develop and validate a standardized scoring system for owners, similar to those established for assessment of respiratory signs.[15] Such a score would help the owners to decide when to seek professional advice.

Of the owners with horses exhibiting clinical signs of EPD at the time of the study, only 27 % had consulted their veterinarian before deciding on a treatment, even though 78 % of those horses were treated in the month before the study. We could show that most owners start treatments that are easily available (including coconut oil, essential oils or wound creams containing dexpanthenol) before consulting their veterinarian, as suggested in other studies.[7,14,27] These results reflect the inclination of owners to use home-made products or to follow recommendations found on the internet, before consulting a veterinarian. The rather restrictive use of systemic antibiotics is good practice. Nevertheless, the fact that 33 % of owners waited until the horse showed signs of pain or lameness before calling their veterinarian and 17 % reported to never seek professional veterinary advice, further supports the view that many owners are not aware of the consequences of the disease. This in turn has implications on animal welfare as the horses could be diagnosed earlier and potentially better treated.

On the other hand, 65 % of owners reported to have consulted a veterinarian to confirm the diagnosis of EPD. This difference in response rate can be explained by the timepoint the questions were inquiring about. The first question (if the diagnosis of EPD was confirmed by a veterinarian) was about a veterinary visit at any timepoint (even years ago), and the second question was about a veterinary visit during the current EPD episode. Given that only 27 % of owner consulted their veterinarian at the second time point, this could be an indication that owners seek professional veterinary advice once, but then continue the treatment themselves and do not consult their veterinarian a second time if there is a recurrence of EPD.

One of the first principal recommendations given by many authors [7,14,19,27] for the treatment of EPD is the clipping of feathers. It was therefore surprising that only 64 % of the owners clipped the feathers of their horses. Another surprising result was the restrictive use of anti-parasitic treatment, especially given the over-representation of draft breeds in the study population (1,8 % of draft breeds in the study compared to 2,6 % of draft breeds in the total Swiss equid population). In draft breeds, an involvement of chorioptic mites is often suspected[13,16] and in these cases, treatment with anti-parasitic products (e. g. fipronil or doramectin) could be indicated and was proven useful.[9,17] This restrictive use of anti-parasitic treatment could be due to a lack of awareness by the owner and/ or treating veterinarian.

Similar to a previous representative study on housing conditions of Swiss horses[8] conducted in 2004, only a low proportion of horses were permanently living on a pasture in our sample. This is surprising, since prolonged standing on damp or muddy soil is thought to be associated with EPD.[19,21] The proportions of thoracic and pelvic legs as well as white and pigmented extremities affected in our study were similar to previous reports.[4,7,21] A future study should aim to investigate leg position and pigmentation as causes for an increased occurrence.

We included only horses showing clinical signs of EPD in the last two years and limited the treatment period

to two years in order to minimize recall bias. In human epidemiology, the suggested time frame to reduce recall bias is six months to one year.[3] However, since most horses (92 %) had clinical signs at the time of the survey and most questions referred to the situation at the time of disease, recall bias can be considered as low. Questions were kept short and simple and open questions were avoided where possible to avoid questionnaire associated bias. The questionnaires were completed by the owner without input from any of the authors. The authors acknowledge the limitations of the present study, particularly that the results of the questionnaires are based on the perceptions of owners with varying levels of experience, and not those of a veterinarian. The present descriptive results form a basis for the design of future case-control or prospective, longitudinal studies to further investigate risk factors for EPD.

In conclusion, a majority of owners decided on a course of treatment before consulting their veterinarians. Because of this, underlying causes of the pastern dermatitis were more difficult or even impossible to determine making correct treatment decisions more difficult. Specific information campaigns could help to raise owner disease awareness for earlier diagnosis and treatment for this common and often frustrating condition.

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Disclosure statement

The authors declare no competing interests.

Ethics approval and consent to participate

The study was based only on questionnaire data from horse owners without any examinations performed on animals. Written informed consent was obtained from all horse owners.

Signes cliniques rapportés par les propriétaires et décisions de traitement dans la dermatite du paturon chez les chevaux

La dermatite du paturon a une prévalence élevée dans la population équine, en particulier chez les races de trait. Cette affection cutanée est difficile à traiter et on soupçonne que les propriétaires décident souvent d'un traitement sans consulter un vétérinaire. Les objectifs de cette étude étaient de décrire les signes cliniques rapportés par les propriétaires, la sévérité et les raisons de consulter un vétérinaire. De plus, nous nous sommes renseignés sur les mesures préventives et les traitements, qu'ils soient mis en place par les propriétaires sans consultation préalable ou prescrits par leurs vétérinaires.

Un total de 123 chevaux (propriétaires recrutés via les médias sociaux) ont été inclus dans l'étude. Tous les chevaux ont souffert de dermatite du paturon au moins une fois au cours des deux années précédant l'étude. Des questionnaires standardisés, recueillant des informations sur la gestion, les conditions de logement, les signes cliniques ainsi que les mesures préventives et les traitements, ont été remplis par les participants. Les données ont été enregistrées et des statistiques descriptives ont été réalisées.

La plupart des chevaux (71 sur 115 réponses disponibles, 62 %) avaient présenté des signes cliniques de dermatite du paturon au moins quatre fois dans leur vie. Au total, 113 chevaux (92 % de tous les chevaux inclus) étaient atteints de dermatite du paturon équin au moment de

Segni clinici e decisioni sul trattamento da parte dei proprietari in caso di dermatite al pastorale nel cavallo

La dermatite al pastorale (Equine pastern dermatitis) ha una grande prevalenza nella popolazione equina, specialmente in quella a sangue freddo. Questa condizione della pelle è difficile da trattare, e si sospetta che i proprietari spesso decidano di trattarla senza consultare un veterinario. Gli obiettivi di questo studio erano di descrivere i segni clinici riportati dai proprietari, la gravità e le ragioni della consultazione dal veterinario. Inoltre, abbiamo raccolto informazioni sulle misure preventive e i trattamenti, sia intrapresi dai proprietari senza consultazione precedente che prescritti dai veterinari.

Un totale di 123 cavalli (i proprietari sono stati reclutati sui social media) sono stati inclusi nello studio. Tutti i cavalli hanno sofferto di dermatite al pastorale almeno una volta nei due anni precedenti lo studio. Ai partecipanti è stato richiesto di completare dei questionari standardizzati che raccoglievano informazioni sulla gestione, le condizioni di stabulazione, i segni clinici, le misure preventive e i trattamenti. I dati sono stati registrati e sono state eseguite statistiche descrittive.

La maggior parte dei cavalli (71 su 115 risposte disponibili, 62%) aveva mostrato segni clinici di dermatite al pastorale almeno quattro volte nella sua vita. Un totale di 113 cavalli (92% di tutti i cavalli inclusi) erano affetti dalla dermatite al pastorale al momento dell'intervista. Per 37 cavalli (32%) su 114 risposte disponibili, i

l'entretien. Pour 37 chevaux (32%) sur les 114 réponses disponibles, les propriétaires ont consulté leur vétérinaire uniquement après que le cheval a eu montré des signes de douleur ou de boiterie. En général, les traitements qui ne nécessitaient pas de prescription médicale étaient appliqués sans consulter leur vétérinaire (par exemple, seuls 9 % [14 sur 150 prescriptions] des crèmes topiques favorisant la cicatrisation des plaies étaient prescrites par un vétérinaire). Au total, 31 décisions de traitement (55%) avec des crèmes contenant des agents antibactériens, antimycosiques et/ou anti-inflammatoires et 100% des médicaments systémiques contenant des agents antibactériens, antiparasitaires ou anti-inflammatoires ont été prescrits par des vétérinaires. Dans l'ensemble, 69 % des décisions de traitement ont été prises sans consulter un vétérinaire, ce qui rend plus difficile la détermination des causes sous-jacentes de la dermatite du paturon et rend le traitement souvent plus long et plus onéreux. Pour sensibiliser les propriétaires aux conséquences possibles d'une consultation trop tardive d'un vétérinaire dans le processus de la maladie, des campagnes d'information spécifiques visant à améliorer le bien-être des animaux devraient être envisagées.

Mots clés: Cheval, signes cliniques rapportés par le propriétaire, dermatite du paturon, traitement.

proprietari hanno consultato il loro veterinario solo dopo che il cavallo ha mostrato segni di dolore o di zoppia. Di solito, i trattamenti che non richiedevano una prescrizione medica sono stati applicati senza consultare il veterinario (ad esempio, solo il 9% (14 su 150 prescrizioni) delle creme topiche che promuovono la guarigione delle ferite sono state prescritte da un veterinario). Un totale di 31 decisioni di trattamento (55%) con creme contenenti agenti antibatterici, antimicotici e/o antinfiammatori e il 100% dei farmaci sistemici contenenti agenti antibatterici, antiparassitari o antinfiammatori sono stati prescritti da veterinari. Nel complesso, il 69% delle decisioni di trattamento sono state prese senza consultare un veterinario, rendendo così più difficile determinare le cause alla base della dermatite al pastorale e rendendo il trattamento spesso più lungo e oneroso. Alfine di sensibilizzare i proprietari sulle possibili conseguenze di una consultazione veterinaria tardiva nel processo della malattia, dovrebbero essere prese in considerazione campagne di informazione specifiche per migliorare il benessere degli animali.

Parole chiave: Cavallo, segni clinici riportati dal proprietario, dermatite al pastorale, trattamento

Owner reported clinical signs and treatment decisions in equine pastern dermatitis

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