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Clinical trial of cetirizine in seasonal headshaking horses

Can we predict the effectiveness using population parameters?

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Abstract

Idiopathic headshaking is a disorder caused by a lower stimulus threshold of the trigeminal nerve. Headshaking is characterized by uncontrollable shaking and tossing of the head and can be seasonal or non-seasonal. Because an allergic component may play a role in seasonal headshaking the therapeutic effect of the antihistamine cetirizine was tested. This paper focusses on population parameters. Can they help in predicting whether cetirizine treatment will be effective?

83 owners of headshaking horses filled out a questionnaire regarding the use of the horse, the way of housing, the history of the horse and questions about the shaking behaviour and possible triggers for shaking.

A double blind placebo controlled clinical trial was conducted using 30 horses. The horses were treated with cetirizine (0.4 mg/kg twice daily) and a placebo, both for a week with a washout week in between. At the start of the experiment and at the end of every treatment week a standardised movie was made to assess the amount of headshaking. When counting the headshaking in these movies, there was no significant difference between the cetirizine and placebo treatment. However, four of the 30 horses showed a clinically significant improvement with cetirizine based on (blinded) owner opinion. Population parameters were analysed in order to compare these 4 horses to the non-responders. The four horses in the effective group all showed signs of respiratory disease beside their headshaking and this proportion was significantly different from that of the non-responding horses. Although the group of horses responding to therapy was small, this significant finding may be of clinical interest and warrants further research.

Introduction

Idiopathic Headshaking (HSK) is a disorder that occurs spontaneously and is characterized by uncontrollable shaking and tossing of the head. Snorting, sneezing and nose rubbing are also common in headshaking horses¹. HSK affects mainly adult horses with reported median ages between 8 and 10². Headshaking can be seasonal or non-seasonal. The movements of the head and neck can be horizontal, vertical or a combination of both³. Headshaking is defined as idiopathic when all other potential causes such as dental problems, upper airway diseases, ear mites and allergic rhinitis or sinusitis, have been ruled out^{3,1}.

In the past headshaking was often dismissed as a behavioural problem or stereotypic behaviour. Nowadays there is growing evidence that headshaking horses may be suffering from a trigeminal neuropathy that causes hypersensitivity and irritation⁴. Research performed in 2013 confirmed the involvement of the trigeminal nerve and showed that headshakers have a significantly lower stimulus threshold, making the affected horse more sensitive and overresponsive when exposed to small stimuli¹. Because of these recent findings the term trigeminal mediated headshaking is more appropriate than idiopathic headshaking². Therefore from here on, in this paper the term trigeminal mediated headshaking (TMH) will be used.

As a cause of the lower threshold of the trigeminal nerve a latent EHV 1 infection has been suggested. This theory is based on a comparable phenomenon in humans, in which reactivation of a latent infection with the varicella-zoster virus in the trigeminal nerve causes neuropathic facial pains. The varicella-zoster virus is also a herpes virus. However, a study performed by Aleman and Pickles in 2012 showed that there was no difference in the presence of EHV 1 in the trigeminal ganglia between headshakers and healthy horses⁵.

Headshaking seems to have a worldwide distribution. The only prevalence ever reported was a 1-1.5% in the UK population by Slater in 2013⁶.

Reported therapeutic options

Headshaking is a difficult syndrome to treat, mainly because the exact aetiology is still unknown. Therefore, the therapies used are not curative but aim to alleviate the symptoms and give the horse a better quality of life². There are many therapeutic options, both pharmacologic and surgical, but none are effective in all headshaking horses⁷. Some of the most frequently used therapies will be described below.

Nose nets

So far nose nets seem to be the most effective therapy. Nose nets exist in many different forms. Some only cover the nose, whereas others also cover the mouth⁷. The exact working mechanisms of these nose nets are still unknown. Possibly the stimuli generated by the constant skin contact of the nose net inhibits other stimuli, as a form of distraction². Another possibility is that it might inhibit the receptors in the affected area². In a study done in 2003 about 75% of the owners noticed at least some improvement after they started using a nose net⁸.

Pharmacologic Treatment

Cyproheptadine

There are several pharmacologic treatments used to treat HSK. One of them is cyproheptadine, a first-generation antihistamine with additional anticholinergic, anti-serotonergic, calcium channel blocking and local anesthetic activity. Cyproheptadine has been tested with conflicting results. A study by Madigan and Bell in 2001 reported a moderate or great improvement in 70% of 61 horses. After the therapy was stopped owners reported a recurrence of symptoms^{7,12}. Another British study on the other hand showed no improvement on a cyproheptadine treatment, though in that study it was only tested on 3 horses³.

The downside of cyproheptadine is that side effects are common. Approximately 50% of the horses treated showed lethargy, anorexia and drowsiness. Gastrointestinal side-effects were also reported often².

Cyproheptadine has also been tested in combination with carbamazepine. In a study with 20 headshakers, the 3 horses that were treated with only cyproheptadine showed no improvement. The combination of cyproheptadine and carbamazepine was more successful, with a positive response in 7 horses³. There are some indications that modern antihistamines might also be effective without causing these side effects².

Carbamazepine:

Carbamazepine is an anticonvulsant that stabilizes voltage-gated sodium channels. It is the drug that is most often used in the treatment of trigeminal neuralgia in humans. One study reported a reduction of the symptoms but it was only tested on a few horses. There are some unpublished findings that show no effect⁷.

Sodium cromoglycate eye drops:

The use of sodium cromoglycate eye drops has shown to be an effective treatment in 3 headshaking horses in one study. All three horses showed the shaking when they were brought into the light. Besides that, the horses had a bilateral mucoid ocular discharge. The

horses were treated with one drop per eye four times a day. In all three horses the headshaking improved significantly or stopped on this treatment⁹.

Melatonin:

Melatonin is used in seasonal headshakers to influence the photoperiod. To be effective, treatment should be started before the onset of spring and continued until late fall or even all year round in some cases. Also, it should be administered exactly at 5 pm every day and has some side effects: some horses don't shed their coat and need to be clipped. It has shown to be effective in some cases^{2,7}.

Surgical interventions

Caudal compression of the infraorbital nerve:

During this surgical technique platinum embolization coils are placed in the caudal part of the infraorbital canal via the maxillary foramen. Multiple variations in the surgical plan did not seem to affect the outcome. This technique was initially successful in 35 out of 57 horses. However, 9 of them relapsed. In a few the surgery was repeated. The final success rate is 28 out of 57 horses (49%). Unfortunately, this procedure comes with serious side-effects. After surgery 64% of the horses showed nose rubbing which sometimes resulted in self-inflicted trauma and an increase of headshaking¹⁰.

Percutaneous electrical nerve stimulation (PENS):

In a recent study, performed by Roberts et al. in 2016, percutaneous electrical nerve stimulation was applied to 7 headshaking horses. This therapy has also been used in humans suffering from neuropathic pain. A disposable electrical probe was inserted subcutaneously just superficial to the infraorbital nerve. The nerve was then stimulated according to a 25-minute protocol of alternating frequencies based on the protocol used in humans. This procedure was well accepted by sedated horses. The results were positive as 5 out of 7 horses were able to return to ridden work at the same level as before they started headshaking. However, the therapy had to be repeated several times in order to obtain a long-lasting relief of symptoms¹¹.

The cetirizine study

In seasonal headshakers an allergic component may play a role. The clinical presentation and seasonal incidence show similarities with allergic rhinitis in humans¹². Cetirizine is widely used to alleviate the symptoms of seasonal allergic rhinitis in humans¹³. In 2008 the pharmacokinetics and pharmacodynamics of cetirizine in horses were studied by Olsen et al. This study showed that when 0.2-0.4 mg/kg cetirizine was given to horses twice a day, it reduced the wheal formation after cutaneous histamine injections with $68 \pm 11\%$ ¹³. This suggests that cetirizine might be a useful antihistamine in horses as well. Little is known about the effect of modern antihistamines in headshaking horses, but in owner surveys anecdotal effect was reported¹⁴. Also Pickles et al. mention unpublished data suggesting a possible effect².

A study was conducted to assess the effect of cetirizine in seasonal headshaking horses.

The aim of this paper is to first describe population parameters using owner-questionnaires. Subsequently the group of horses in which the cetirizine treatment was effective will be compared to the group in which the cetirizine treatment was not effective. Are they

different? Are there parameters that might be used to predict the effectiveness of cetirizine in individual cases? The parameters that will be looked at are: Age, sex, breed, severity of shaking, type of shaking, the influence of weather circumstances on the shaking behaviour, the presence of nose rubbing behaviour, the effectiveness of a nose net and the presence of other health problems. The hypothesis is: there is a significant difference in parameters between the two groups. Parameters that can be associated with an allergic rhinitis, such as: nose rubbing, the effectiveness of a nose net and the presence of other health problems, are most expected to show a difference. Nevertheless the hypothesis will be tested for all parameters.

Material and methods

A double blind clinical trial was conducted with 30 seasonal headshakers. The horses were treated with cetirizine for one week and then with a placebo for another week. The headshaking behaviour of the horses was recorded on video before and after both treatment weeks using a lunging protocol. For the duration of the trial the owners were also asked to keep a journal on their horses headshaking behaviour.

The research started with a an announcement in several 'veterinary' journals ('Tijdschrift voor Diergeneeskunde' and 'Hippische Ondernemer') and on Facebook, asking owners of seasonal headshakers to participate in this clinical trial. More than a hundred people responded and this eventually resulted in 83 horse owners who filled out a questionnaire about their headshaking horse.

This questionnaire consisted of 23 questions regarding the use of the horse, the way of housing, the history of the horse and questions about the shaking behaviour and possible triggers for shaking.

In order to get reliable results the sample size for the trial was calculated to be 30. The sample size was calculated by conducting a two-sample comparison of proportions. The significance level was set at 0.05, the power at 0.8. The proportion of horses responding to treatment was set at 0.50 and on placebo at 0.10. 'Responding' was defined as a 50% decrease in headshaking on treatment (or placebo) relative to baseline. This calculation showed that the number of horses needed was 15 horses per group. Although the crossover design of the study was not taken into account in this calculation, 30 horses were included.

From the 83 applications 30 horses were selected to participate in the study. This selection was made based on several selection criteria; First of all the headshaking had to be seasonal. Horses that were headshaking all year round were excluded from the trial. Secondly the horses had to be shaking for at least 2 seasons and they had to shake in spring, since that was when the study took place. Also, it had to be possible for the horses to be lunged in walk and trot, since that is a crucial part of the research. During lunging they had to shake at least once a minute. Out of the horses that met all the selection criteria, 30 were selected.

Prior to the experiment all horses were visited by at least one of the veterinarians leading the experiment. The owners were informed about what they could expect and the horses were examined clinically to rule out any other obvious physical reasons for headshaking.

The experiment was conducted between the last week of April and the end of June 2015. For logistic reasons the horses were divided in three groups. The experiment took 21 days.

Day 0: first video recording, start trial.

On day zero the horses were visited by two students. They brought the medication and made a video recording of the horse. The movies were all recorded according to the following 9 minute- protocol:

- 1 minute standing still on a loose robe
- 2 minutes' walk clockwise
- 2 minutes' walk anticlockwise
- 2 minutes' trot anticlockwise
- 2 minutes' trot clockwise.

During this visit the owners also received two boxes with medication. Each box contained 14 small jars with tablets. One of the boxes contained cetirizine tablets and the other a placebo. The cetirizine tablets were dosed at 0.4 mg/kg twice a day. In the placebo week the horse got the same amount of placebo tablets, which closely resemble the cetirizine tablets. The day after this visit the first treatment week started.

Day 7: second video recording, start wash-out week

At day seven, after the first treatment round a second visit was made by the students. During this visit a second movie was made using the same lunging protocol. After this visit the washout week started.

Day 14: start of the second treatment round

At day fourteen the owners started giving the horses the medication from the second box.

Day 21: Last video recording, end of the trial.

At day twenty-one the students saw the horses for the last time to make the last video recording.

The study was performed double blind. Both the owners and the students and veterinarians executing the study did not know which tablets were the cetirizine tablets and which were placebo tablets.

During the three weeks of the trial the owners were asked to keep a diary on their horses' headshaking behaviour. They were asked to fill in what they did with the horse, what the weather was like and how severe the headshaking was. The owner-questionnaire and the diary forms are enclosed as appendix.

The effectiveness of the cetirizine treatment was assessed in two ways. First the amount of headshaking on the video's was counted. This was done blindly by two veterinarians.

Secondly the diaries the owners kept during the experiment were used. At the end of both treatment weeks the owners were asked whether they thought the treatment had been effective. There were five response options; a. no effect, b. less than 50% improvement, c. 50-80% improvement and d. 80-100% improvement. e. impossible to judge.

The horses that scored c or d, more than 50% improvement in the cetirizine week were classified as effective. Horses that scored a, b or e were classified as ineffective. Horses that

showed less than 50% improvement were not included in the effective group because a small change was not considered clinically relevant or could be caused by the weather or other circumstances.

The 83 questionnaires that were filled out by the horse owners were used to assess the parameters of this sample of the Dutch seasonal headshaking population. The parameters that were looked at are: Age, breed, sex, severity of shaking, type of shaking, the influence of weather circumstances on the shaking behaviour, the presence of nose rubbing behaviour and the effectiveness of a nose net. Then the group in which the cetirizine treatment was effective and the group in which it was not effective were compared, using a one sample t-test, a chi square test or a Fishers exact test, depending on the data type concerned.

Results

Outcome of the questionnaires; population description

Age

The mean age of the 83 seasonal headshakers was 12 years with a standard deviation of 5 and a range between 4 and 25.

Breed

Many breeds were represented in the group of horses that participated in this research. The breeds were divided into groups based on cognation. The distribution is presented in table 1.

Mare-gelding distribution for different breeds

	Mares (percentage of total in category)	Geldings (percentage of total in category)	Total (percentage)
Warmblood horses	8 (21%)	30 (79%)	38 (46%)
Ponies	4 (31%)	9 (69%)	13 (16%)
Trotting horses	2 (50%)	2 (50%)	4 (5%)
Cob type horses	5 (42%)	7 (58%)	12 (15%)
Paints and quarters	2 (25%)	6 (75%)	8 (10%)
Cross breeds	3 (50%)	3 (50%)	6 (7%)
Arabian horses	1 (50%)	1 (50%)	2 (2%)
Total	25 (30%)	58 (70%)	83

Table 1

Sex

This research shows a distribution of 70% gelding and 30% mares. The group was split into two groups based on breed to assess if there is a difference in the percentages geldings between breeds. Two groups were made: The first group consisted of warmblood horses, trotting horses, paints and quarters and Arabians. The second group consisted of cob type horses and ponies. Cross breeds were left out of this equation. A chi-square test was conducted. The outcome was 1.001 with 1 df and a significance of 0.3. This means that there is no significant difference in the distribution of mares and geldings between the breeds.

A second chi-square test was conducted comparing the warmblood horses to the other breeds, including the crossbreeds. The outcome of this test was 2.74 with 1 df and a significance of 0.98. This is also not significant.

Severity:

The severity of the headshaking was rated with a four-point system. 4 points being the most severe. The owners were asked to rate the severity of their horses' headshaking. How much did the horse shake when riding, lunging or whenever the shaking occurs?

Answer A=4 points: Headshaking occurs every time (almost) continuously.

Answer B= 3 points: headshaking occurs every time a few times per minute.

Answer C= 2 points: headshaking occurs every time a few times every ten minutes.

Answer D=1 point: Shaking occurs often but not every time.

When multiple answers were chosen the average of both answers was used. The scores were added up to calculate an average score. The average severity is 2.9. The results are presented in table 2.

Severity of headshaking according to the owner

Severity	Number of times chosen
A: Headshaking occurs every time (almost continuously)	21
B: Headshaking occurs every time a few times per minute	25
C: Headshaking occurs every time a few times every ten minutes	12
D: Headshaking occurs often but not every time	11
A and B	7
B and C	7
C and D	1
No answer	5
Total	83

Table 2: A,B,C and D represent answer options. The owners were asked how often the headshaking occurred

Type of shaking, weather influences, nose rubbing and the effectiveness of the nose net

In the questionnaires that were filled out by the owners a few of the more common and easy to recognise symptoms of headshaking were assessed. The owners were asked whether their horse moves its head horizontally, vertically, or a combination of the two. Also, the influence of the weather was assessed. The results are presented in table 3.

In this study the reported success rate of nose nets is 22%. When we include the cases in which it was partially successful it is 53%.

Comparing the effective group and the not effective group

The dairies the owners kept during the experiment were used to determine whether the cetirizine

characteristics of the headshaking behaviour according to the owners

	% of total (83 horses)
Nose rubbing (+ and +/-)	84
Nose rubbing (+)	55
Nose net effective or a little effective	53
Nose net effective	22
Nose rubbing + nose net effective	46
Shaking occurs indoors and outdoors	57
Shaking occurs only outdoors	40
Shaking improves when raining	40
Shaking improves when windy	6
Shaking worse when raining	18
Shaking worse when windy	45
Shaking worse when sunny	71
Combination of horizontal and vertical shaking	33
Horizontal shaking of the head	2
Vertical shaking of the head	65

Table 3: Nose rubbing (+ and +/-): percentage of horse owners that answered 'yes' or 'sometimes' when they were asked whether their horse showed nose rubbing. Nose rubbing (+): percentage of owners that answered 'yes' when they were asked whether their horse showed nose rubbing.

trial was successful. At the end of both treatment weeks the owners were asked whether they thought the headshaking had improved.

The owners of 4 out of the 30 horses noticed more than 50 % improvement. This group was compared to parameters of the 26 remaining horses that showed no or less than 50% improvement.

Age

The mean age of the effective group is 11 years and of the ineffective group 12 years. A one sample t-test showed that those are not significantly different.

Sex

The mare gelding distribution in the effective group is 50-50 and in the not effective group it is 31% mares and 69% geldings. A fishers exact test showed that this is not a significant difference.

Breed

75% of the effective group consists of warmblood horses compared to 81% in the not effective group. A fishers exact test showed that this difference is not significant.

Severity

The mean severity in the effective and ineffective group both is 3.4.

Other health problems

The last question the owners had to answer in the questionnaire was whether their horse has any other health problems besides the headshaking. Some of the owners answered that their horse suffered from redness of the conjunctivae or had ocular discharge regularly. These horses were labelled in the table as those having eye problems. Some other horses suffered from airway related problems such as nasal discharge, coughing and shortness of breath. These horses were labelled as having airway problems.

A Fishers exact test was performed for all parameters shown in table 4. For the parameter 'airway problems' the test gave a p-value of 0.044. That means that horses in the effective group have significantly more airway problems according to their owners. The fishers exact test showed no significant difference for the other parameters.

Comparison between the effective and the ineffective group for different parameters.

	%Effective (N= 4)	% Not effective (N=26)
Percentage geldings	50	69
Warmblood horses	75	81
Draft type horses	25	19
Vertical shaking	75	54
Combined shaking	25	46
Horizontal shaking	-	-
Severity:	3.4	3.4
Nose rubbing	75	85
Nose net	75	77
effective(partially)		
Shaking occurs outdoors only	25	39
Shaking occurs both indoors and outdoors	75	54
Shaking less severe when raining	75	42
Shaking less severe when windy	-	12
Shaking more severe when it is windy	25	46
Shaking more severe when sunny	100	77
Eye problems	25	23
Airway problems	100	19

Table 4

Discussion

Outcome of the questionnaires; population description

The 83 questionnaires the horse owners filled out were used for a description of the population of seasonal headshakers in the Netherlands. This makes it possible to compare the Dutch population to populations used in previous studies. In comparing these we must realise that for this trial only the seasonal headshakers were used while other studies usually looked at the complete headshaking population. Previous studies have shown a 59% and 64% seasonality^{14,15}.

Age

If we than compare the mean age of 12 years we found to those found in previous studies, we find mean ages that are a little lower than the one found in this research . In literature mean ages have been reported of 8³, 9¹⁴ 9,5¹⁵ and 10¹⁷ years.

Breed

In our population warmblood horses comprise the biggest group(46%), followed by ponies (16%) and cob type horses (15%). Other studies have shown an overrepresentation of thoroughbreds¹⁴ or an equal distribution¹⁵. This difference is probably due to a different distribution of breeds between countries.

Sex

Geldings seem to be affected more often. This study showed a distribution of 70% geldings and 30% mares. In a study with mostly horses from the USA the geldings comprised 72% of the cases. Studies performed in the UK showed a similar overrepresentation of geldings, 70% and 63% respectively^{12,15}. Research performed by Mills et al. in 2002 shows that headshaking in geldings is more often seasonal than in mares. With a reported 67% seasonality in geldings compared to 54% in mares¹⁵. No reason has yet been identified for this overrepresentation of geldings.

Other parameters

In table 5 characteristics of headshaking behaviour that were assessed in our questionnaire were compared to those found in other studies.

It is important to keep in mind that the percentages found are based on the observations and interpretations of horse owners. Therefore, they might not be completely accurate.

In a study performed by Mills et al. in 2002, the use of a nose net was completely successful in 27% of the cases. It was tested in 179 horses.¹⁴ The success rate of 22% we found is quite similar.

Comparison between percentages reported in literature and those found in this study, for 5 parameters.

	% found in literature	% found in this study
Vertical shaking of the head	89, 92, 79 ^{12,14,15}	98
Horizontal headshaking	25, 32, 7 ^{12,15,16}	35
Shaking improves when it's raining	58 ¹⁵	39
Shaking improves on windy days	22 ¹⁵	6
Shaking gets worse on windy days	22 ¹⁵	44

Table 5

Comparing the effective group and the not effective group

Even though the group in which cetirizine was effective was very small, a significant difference was found for the parameter 'airway problems'. It is possible that the airway related symptoms we found were there because an allergic rhinitis was the cause of the headshaking¹². If an allergic rhinitis was only the trigger in the horses which responded to the cetirizine treatment, then that could be the reason why cetirizine was effective in these horses and not in others.

In order to confirm this theory more research is needed. Perhaps a study that assesses the effect of cetirizine in a group of horses that all show signs of an allergic rhinitis.

In this study horses with a conjunctivitis were labelled as having 'eye problems'. Although no difference between the groups was found for this parameter, it might be an interesting parameter for further research because of the association between allergic rhinitis and conjunctivitis in humans.

Because the group in which the cetirizine treatment was effective was so small it is possible other differences between the groups were missed.

Limitations of the study

When interpreting the results of the present study it is important to keep in mind that at the time the research started some horses had not started shaking yet. This was probably due to the late onset of spring and the cold weather. This made it difficult or maybe even impossible for the owners to know whether the cetirizine treatment was effective. These horses were not excluded therefore they may lower the effectiveness of the treatment. The fact that some horses had not started shaking probably also affected the outcome of results based on the movies.

Also, measuring the effectiveness by the opinion of the owner is not very objective. Even though they didn't know when their horse was getting the cetirizine they did not count the decrease in shaking but gave an estimation. The film protocol, though objective and counted blindly only captured 9 minutes of every week. Therefore it could very well be influenced by other circumstances like rain, sunshine, people or animals walking by or just by chance.

Conclusion

This study gave a description of several parameters of the population of Dutch headshaking horses. Comparison of the horses that responded to cetirizine in the trial to those who did not respond showed a significant difference concerning respiratory problems. Considering the small number of horses responding, this warrants further research.

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Appendix 1:

Vragenlijst Onderzoek Hoofdschudden

*= doorhalen wat niet van toepassing is of, bij digitaal invullen: verwijder foutieve antwoorden.

1. Gegevens eigenaar/eigenaresse: (adres waar het paard staat hoeft u nu nog niet in te vullen)
 - Naam:
 - Adres:
 - Postcode:
 - Woonplaats:
 - Telefoonnummer:
 - e-mailadres:

2. Naam paard/pony*:

3. Ras:

4. Geslacht:

5. Leeftijd en/of geboortedatum:

6. Gebruiksdoel (+ niveau indien van toepassing):

7. Neemt u deel aan wedstrijden?:

8. Huisvesting:
 - a. Stal? Ja/nee* Indien ja: Bodembedekking?:Stro/vlas/zaagsel/anders, nl:*
 - b. Buiten?
 - Zomer: Weide/zandpaddock/op stenen/anders, nl:*
Aantal uren per dag:
 - Winter: weide/zandpaddock/op stenen/anders, nl:*
Aantal uren per dag:

9. Voeding (stalperiode) (Is er geen stalperiode, ga dan door naar vraag 10)
 - a. Type ruwvoer en hoeveel?Hooi/voordroogkuil/kuil/gras/ anders, nl:*
Aantal kg/24u:
 - b. Type krachtvoer en hoeveel? Type:
Aantal kg/24u:

10. Voeding (weideperiode) (Is er geen weideperiode, ga dan door naar vraag 11)
 - a. Type ruwvoer en hoeveel?Hooi/voordroogkuil/kuil/gras/anders*, nl:
Aantal kg/24u:
 - b. Type krachtvoer en hoeveel? Type:
Aantal kg/24u:

11. Heeft uw paard/pony problemen (gehad) aan:
 - a. Het gebit/manier van eten? Wanneer, korte beschrijving van de klachten en evt relatie met klachten van hoofdschudden?

- b. De luchtwegen (incl de luchtzakken)? Wanneer, korte beschrijving van de klachten en evt relatie met klachten van hoofdschudden?
- c. De ogen? Wanneer, korte beschrijving van de klachten en evt relatie met klachten van hoofdschudden?
- d. De huid? Wanneer, korte beschrijving van de klachten en evt relatie met klachten van hoofdschudden?

12. Paard in bezit van deze eigenaar sinds (jaartal & evt maand):

13. Klachten van hoofdschudden voor het eerst gezien in (seizoen of maand & jaar):

14. Klachten zijn het ergst in (meerdere antwoorden mogelijk):

- a. Voorjaar
- b. Zomer
- c. Herfst
- d. winter

Opmerkingen/specificeren:

15. Klachten zijn sindsdien (gezien over meerdere seizoenen/jaren):

- a. Verminderd
- b. Verergert
- c. Ongeveer gelijk gebleven

Opmerkingen:

16. Het paard/ de pony laat de klachten zien (meerdere antwoorden mogelijk):

- a. Vrij (in de weide/paddock)
- b. Aan de longe
- c. Onder het zadel
- d. Voor de wagen

Opmerkingen:

17. De ernst van het hoofdschudden laat zich (*in een periode van klachten*, onder bovengekozen omstandigheden (bv rijden/longeren)) het beste beschrijven door:

- a. Het hoofdschudden treedt elke keer op en vrijwel continu
- b. Het hoofdschudden treedt elke keer op en dan enkele keren per minuut
- c. Het hoofdschudden treedt elke keer op en dan enkele keren per 10 minuten
- d. Het hoofdschudden treedt meestal op, maar niet altijd.
- e. Anders, namelijk:

18. Het paard/ de pony schudt...

- a. Alleen buiten
- b. Alleen binnen
- c. Zowel binnen als buiten

Opmerkingen:

Appendix 2:

DAGBOEK

Onderzoek Hoofdschudden

Periode 1

Eigenaar:

Paard:

Nummer:

Periode 1

Dag 1:

Vandaag is het eerste filmpje gemaakt. U begint MORGEN met het geven van de tabletten met nummer 1 erop (2x daags). Vanaf nu begint u met het invullen van dit dagboek.

1. Heeft het paard, naast het maken van het filmpje, vandaag gewerkt?

Met/zonder neusnetje (oid)?

Nee / Ja, namelijk: rijden/longeren/mennen, anders, nl.

2. Hoe heeft u het hoofdschudden vandaag ervaren?

a. In **rust**: Niet / Weinig / Matig / Veel

b. Tijdens **arbeid**: Niet / Weinig / Matig / Veel / nvt

3. Hoe was het weer (tijdens uw observaties)?



En met betrekking tot de wind:

(bijna) Windstil

Milde wind

Matige tot sterke wind

4. Hoe heeft u het gedrag van het paard vandaag ervaren?

Normaal alert / slomer / onrustiger / anders,

nl: _____

5. Heeft u andere opmerkingen?

Nee / Ja, nl:

Periode 1

**Dag 2: Vandaag begint u met de medicatie:
2x daags de tabletten met nummer 1 erop.**

1. Is het gelukt de tabletten in te geven?
Ja / Nee; opmerking (waarom/hoeveel niet?) :

2. Heeft het paard vandaag gewerkt? Met/zonder neusnetje (oid)?
Nee / Ja, namelijk: rijden/longeren/mennen, anders, nl.

3. Hoe heeft u het hoofdschudden vandaag ervaren?

a. In **rust**: Niet / Weinig / Matig / Veel

b. Tijdens **arbeid**: Niet / Weinig / Matig / Veel / nvt

4. Hoe was het weer (tijdens uw observaties)?



En met betrekking tot de wind:

(bijna) Windstil

Milde wind

Matige tot sterke wind

5. Hoe heeft u het gedrag van het paard vandaag ervaren?
Normaal alert / slomer / onrustiger / anders,
nl: _____

6. Heeft u andere opmerkingen?

Nee / Ja, nl:

Periode 1

Dag 3:

1. Is het gelukt de tabletten in te geven?

Ja / Nee; opmerking (waarom/hoeveel niet?):

2. Heeft het paard vandaag gewerkt? Met/zonder neusnetje (oid)?

Nee / Ja, namelijk: rijden/longeren/mennen, anders, nl.

3. Hoe heeft u het hoofdschudden vandaag ervaren?

a. In **rust**: Niet / Weinig / Matig / Veel

b. Tijdens **arbeid**: Niet / Weinig / Matig / Veel / nvt

4. Hoe was het weer (tijdens uw observaties)?



En met betrekking tot de wind:

- (bijna) Windstil
- Milde wind
- Matige tot sterke wind

5. Hoe heeft u het gedrag van het paard vandaag ervaren?

Normaal alert / slomer / onrustiger / anders,

nl: _____

6. Heeft u andere opmerkingen?

Nee / Ja, nl:

Periode 1

Dag 4:

1. Is het gelukt de tabletten in te geven?

Ja / Nee; opmerking (waarom/hoeveel niet?) :

2. Heeft het paard vandaag gewerkt? Met/zonder neusnetje (oid)?

Nee / Ja, namelijk: rijden/longeren/mennen, anders, nl.

3. Hoe heeft u het hoofdschudden vandaag ervaren?

a. In **rust**: Niet / Weinig / Matig / Veel

b. Tijdens **arbeid**: Niet / Weinig / Matig / Veel / nvt

4. Hoe was het weer (tijdens uw observaties)?



En met betrekking tot de wind:

(bijna) Windstil

Milde wind

Matige tot sterke wind

5. Hoe heeft u het gedrag van het paard vandaag ervaren?

Normaal alert / slomer / onrustiger / anders,

nl: _____

6. Heeft u andere opmerkingen?

Nee / Ja, nl:

Periode 1

Dag 5:

1. Is het gelukt de tabletten in te geven?

Ja / Nee; opmerking (waarom/hoeveel niet?) :

2. Heeft het paard vandaag gewerkt? Met/zonder neusnetje (oid)?

Nee / Ja, namelijk: rijden/longeren/mennen, anders, nl.

3. Hoe heeft u het hoofdschudden vandaag ervaren?

a. In **rust**: Niet / Weinig / Matig / Veel

b. Tijdens **arbeid**: Niet / Weinig / Matig / Veel / nvt

4. Hoe was het weer (tijdens uw observaties)?



En met betrekking tot de wind:

(bijna) Windstil

Milde wind

Matige tot sterke wind

5. Hoe heeft u het gedrag van het paard vandaag ervaren?

Normaal alert / slomer / onrustiger / anders,

nl: _____

6. Heeft u andere opmerkingen?

Nee / Ja, nl:

Periode 1

Dag 6:

1. Is het gelukt de tabletten in te geven?

Ja / Nee; opmerking (waarom/hoeveel niet?) :

2. Heeft het paard vandaag gewerkt? Met/zonder neusnetje (oid)?

Nee / Ja, namelijk: rijden/longeren/mennen, anders, nl.

3. Hoe heeft u het hoofdschudden vandaag ervaren?

a. In **rust**: Niet / Weinig / Matig / Veel

b. Tijdens **arbeid**: Niet / Weinig / Matig / Veel / nvt

4. Hoe was het weer (tijdens uw observaties)?



En met betrekking tot de wind:

(bijna) Windstil

Milde wind

Matige tot sterke wind

5. Hoe heeft u het gedrag van het paard vandaag ervaren?

Normaal alert / slomer / onrustiger / anders,

nl: _____

6. Heeft u andere opmerkingen?

Nee / Ja, nl:

Periode 1

Dag 7:

LET OP! BELANGRIJKE VRAAG

ONDERAAN! En morgenochtend is het extra belangrijk de tabletten WEL te geven in verband met het maken van het filmpje.

1. Is het gelukt de tabletten in te geven?
Ja / Nee; opmerking (waarom/hoeveel niet?): _____

1. Heeft het paard vandaag gewerkt? Met/zonder neusnetje (oid)?
Nee / Ja, namelijk: rijden/longeren/mennen, anders, nl. _____

2. Hoe heeft u het hoofdschudden vandaag ervaren?

a. In **rust**: Niet / Weinig / Matig / Veel

b. Tijdens **arbeid**: Niet / Weinig / Matig / Veel / nvt

3. Hoe was het weer (tijdens uw observaties)?



4. Hoe heeft u het gedrag van het paard vandaag ervaren?
Normaal alert / slomer / onrustiger / anders,
nl: _____

5. Heeft u andere opmerkingen?

Nee / Ja, nl:

6. Heeft het middel naar uw mening de afgelopen week effect gehad op het hoofdschudden van uw paard?

a. Nee

b. Ja, maar minder dan 50% vermindering van de klachten

c. Ja, het gaf 50-80% vermindering van de klachten

d. Ja, het gaf 80-100% vermindering van de klachten

e. Kan ik echt niet beoordelen, omdat

En met betrekking tot de wind:

(bijna) Windstil

Milde wind

Matige tot sterke wind

Periode 1

Dag 8:

Vandaag wordt het tweede filmpje gemaakt. U geeft vandaag de laatste tabletten met nummer 1 erop. U gaat door met het dagelijks invullen van dit dagboek, maar geeft u een week geen tabletten.

1. Is het gelukt de tabletten in te geven? **HOE LAAT 's ochtends?** _____

Ja / Nee; opmerking (waarom/hoeveel niet?) :

1. Heeft het paard, naast het maken van het filmpje, vandaag gewerkt?

Met/zonder neusnetje (oid)?

Nee / Ja, namelijk: rijden/longeren/mennen, anders, nl.

2. Hoe heeft u het hoofdschudden vandaag ervaren?

a. In **rust**: Niet / Weinig / Matig / Veel

b. Tijdens **arbeid**: Niet / Weinig / Matig / Veel / nvt

3. Hoe was het weer (tijdens uw observaties)?



4. Hoe heeft u het gedrag van het paard vandaag ervaren?

Normaal alert / slomer / onrustiger / anders,

nl: _____

5. Heeft u andere opmerkingen?

Nee / Ja, nl:

En met betrekking tot de wind:

(bijna) Windstil

Milde wind

Matige tot sterke wind

DAGBOEK

Onderzoek Hoofdschudden

Periode 2

Eigenaar:

Paard:

Nummer:

Periode 2

Dag 1:

1. Heeft het paard vandaag gewerkt? Met/zonder neusnetje (oid)?
Nee / Ja, namelijk: rijden/longeren/mennen, anders,
nl: _____

2. Hoe heeft u het hoofdschudden vandaag ervaren:
a. In rust: Niet / Weinig / Matig / Veel

b. Tijdens arbeid: Niet / Weinig / Matig / Veel / nvt

3. Hoe was het weer (tijdens uw observaties)?



En met betrekking tot de wind:

- (bijna) Windstil
- Milde wind
- Matige tot sterke wind

4. Hoe heeft u het gedrag van het paard vandaag ervaren?
Normaal alert / slomer / onrustiger / anders,
nl: _____

5. Heeft u andere opmerkingen?

Nee / Ja, nl:

Periode 2

Dag 2:

1. Heeft het paard vandaag gewerkt? Met/zonder neusnetje (oid)?
Nee / Ja, namelijk: rijden/longeren/mennen, anders,
nl: _____

2. Hoe heeft u het hoofdschudden vandaag ervaren:

a. In rust: Niet / Weinig / Matig / Veel

b. Tijdens arbeid: Niet / Weinig / Matig / Veel / nvt

3. Hoe was het weer (tijdens uw observaties)?



En met betrekking tot de wind:

(bijna) Windstil

Milde wind

Matige tot sterke wind

4. Hoe heeft u het gedrag van het paard vandaag ervaren?
Normaal alert / slomer / onrustiger / anders,
nl: _____

5. Heeft u andere opmerkingen?

Nee / Ja, nl:

Periode 2

Dag 3:

1. Heeft het paard vandaag gewerkt? Met/zonder neusnetje (oid)?
Nee / Ja, namelijk: rijden/longeren/mennen, anders,
nl: _____

2. Hoe heeft u het hoofdschudden vandaag ervaren:

a. In rust: Niet / Weinig / Matig / Veel

b. Tijdens arbeid: Niet / Weinig / Matig / Veel / nvt

3. Hoe was het weer (tijdens uw observaties)?



En met betrekking tot de wind:

(bijna) Windstil

Milde wind

Matige tot sterke wind

4. Hoe heeft u het gedrag van het paard vandaag ervaren?
Normaal alert / slomer / onrustiger / anders,
nl: _____

5. Heeft u andere opmerkingen?

Nee / Ja, nl:

Periode 2

Dag 4:

1. Heeft het paard vandaag gewerkt? Met/zonder neusnetje (oid)?
Nee / Ja, namelijk: rijden/longeren/mennen, anders,
nl: _____

2. Hoe heeft u het hoofdschudden vandaag ervaren:

a. In rust: Niet / Weinig / Matig / Veel

b. Tijdens arbeid: Niet / Weinig / Matig / Veel / nvt

3. Hoe was het weer (tijdens uw observaties)?



En met betrekking tot de wind:

(bijna) Windstil

Milde wind

Matige tot sterke wind

4. Hoe heeft u het gedrag van het paard vandaag ervaren?
Normaal alert / slomer / onrustiger / anders,
nl: _____

5. Heeft u andere opmerkingen?

Nee / Ja, nl:

Periode 2

Dag 5:

1. Heeft het paard vandaag gewerkt? Met/zonder neusnetje (oid)?
Nee / Ja, namelijk: rijden/longeren/mennen, anders,
nl: _____

2. Hoe heeft u het hoofdschudden vandaag ervaren:

a. In rust: Niet / Weinig / Matig / Veel

b. Tijdens arbeid: Niet / Weinig / Matig / Veel / nvt

3. Hoe was het weer (tijdens uw observaties)?



En met betrekking tot de wind:

(bijna) Windstil

Milde wind

Matige tot sterke wind

4. Hoe heeft u het gedrag van het paard vandaag ervaren?
Normaal alert / slomer / onrustiger / anders,
nl: _____

5. Heeft u andere opmerkingen?

Nee / Ja, nl:

Periode 2

Dag 6:

1. Heeft het paard vandaag gewerkt? Met/zonder neusnetje (oid)?
Nee / Ja, namelijk: rijden/longeren/mennen, anders,
nl: _____

2. Hoe heeft u het hoofdschudden vandaag ervaren:

a. In rust: Niet / Weinig / Matig / Veel

b. Tijdens arbeid: Niet / Weinig / Matig / Veel / nvt

3. Hoe was het weer (tijdens uw observaties)?



En met betrekking tot de wind:

(bijna) Windstil

Milde wind

Matige tot sterke wind

4. Hoe heeft u het gedrag van het paard vandaag ervaren?
Normaal alert / slomer / onrustiger / anders,
nl: _____

5. Heeft u andere opmerkingen?

Nee / Ja, nl:

Periode 2

**Dag 7: LET OP: Vanaf MORGEN begint u weer met de medicatie:
2x daags de tabletten met nummer 2 erop**

1. Heeft het paard vandaag gewerkt? Met/zonder neusnetje (oid)?
Nee / Ja, namelijk: rijden/longeren/mennen, anders,
nl: _____

2. Hoe heeft u het hoofdschudden vandaag ervaren:

a. In rust: Niet / Weinig / Matig / Veel

b. Tijdens arbeid: Niet / Weinig / Matig / Veel / nvt

3. Hoe was het weer (tijdens uw observaties)?



En met betrekking tot de wind:

(bijna) Windstil

Milde wind

Matige tot sterke wind

4. Hoe heeft u het gedrag van het paard vandaag ervaren?
Normaal alert / slomer / onrustiger / anders,
nl: _____

5. Heeft u andere opmerkingen?

Nee / Ja, nl:

DAGBOEK

Onderzoek Hoofdschudden

Periode 3

Eigenaar:

Paard:

Nummer:

Periode 3

**Dag 1: Vandaag begint u weer met de medicatie:
2x daags de tabletten met nummer 2 erop**

1. Is het gelukt de tabletten in te geven?

Ja / Nee; opmerking (waarom/hoeveel niet?):

2. Heeft het paard vandaag gewerkt? Met/zonder neusnetje (oid)?

Nee / Ja, namelijk: rijden/longeren/mennen, anders, nl.

3. Hoe heeft u het hoofdschudden vandaag ervaren?

a. In **rust**: Niet / Weinig / Matig / Veel

b. Tijdens **arbeid**: Niet / Weinig / Matig / Veel / nvt

4. Hoe was het weer (tijdens uw observaties)?



En met betrekking tot de wind:

(bijna) Windstil

Milde wind

Matige tot sterke wind

5. Hoe heeft u het gedrag van het paard vandaag ervaren?

Normaal alert / slomer / onrustiger / anders,

nl: _____

6. Heeft u andere opmerkingen?

Nee / Ja, nl:

Periode 3

Dag 2:

1. Is het gelukt de tabletten in te geven?

Ja / Nee; opmerking (waarom/hoeveel niet?) :

2. Heeft het paard vandaag gewerkt? Met/zonder neusnetje (oid)?

Nee / Ja, namelijk: rijden/longeren/mennen, anders, nl.

3. Hoe heeft u het hoofdschudden vandaag ervaren?

a. In **rust**: Niet / Weinig / Matig / Veel

b. Tijdens **arbeid**: Niet / Weinig / Matig / Veel / nvt

4. Hoe was het weer (tijdens uw observaties)?



En met betrekking tot de wind:

(bijna) Windstil

Milde wind

Matige tot sterke wind

5. Hoe heeft u het gedrag van het paard vandaag ervaren?

Normaal alert / slomer / onrustiger / anders,

nl: _____

6. Heeft u andere opmerkingen?

Nee / Ja, nl:

Periode 3

Dag 3:

1. Is het gelukt de tabletten in te geven?

Ja / Nee; opmerking (waarom/hoeveel niet?) :

2. Heeft het paard vandaag gewerkt? Met/zonder neusnetje (oid)?

Nee / Ja, namelijk: rijden/longeren/mennen, anders, nl.

3. Hoe heeft u het hoofdschudden vandaag ervaren?

a. In **rust**: Niet / Weinig / Matig / Veel

b. Tijdens **arbeid**: Niet / Weinig / Matig / Veel / nvt

4. Hoe was het weer (tijdens uw observaties)?



En met betrekking tot de wind:

(bijna) Windstil

Milde wind

Matige tot sterke wind

5. Hoe heeft u het gedrag van het paard vandaag ervaren?

Normaal alert / slomer / onrustiger / anders,

nl: _____

6. Heeft u andere opmerkingen?

Nee / Ja, nl:

Periode 3

Dag 4:

1. Is het gelukt de tabletten in te geven?

Ja / Nee; opmerking (waarom/hoeveel niet?) :

2. Heeft het paard vandaag gewerkt? Met/zonder neusnetje (oid)?

Nee / Ja, namelijk: rijden/longeren/mennen, anders, nl.

3. Hoe heeft u het hoofdschudden vandaag ervaren?

a. In **rust**: Niet / Weinig / Matig / Veel

b. Tijdens **arbeid**: Niet / Weinig / Matig / Veel / nvt

4. Hoe was het weer (tijdens uw observaties)?



En met betrekking tot de wind:

(bijna) Windstil

Milde wind

Matige tot sterke wind

5. Hoe heeft u het gedrag van het paard vandaag ervaren?

Normaal alert / slomer / onrustiger / anders,

nl: _____

6. Heeft u andere opmerkingen?

Nee / Ja, nl:

Periode 3

Dag 5:

1. Is het gelukt de tabletten in te geven?

Ja / Nee; opmerking (waarom/hoeveel niet?) :

2. Heeft het paard vandaag gewerkt? Met/zonder neusnetje (oid)?

Nee / Ja, namelijk: rijden/longeren/mennen, anders, nl.

3. Hoe heeft u het hoofdschudden vandaag ervaren?

a. In **rust**: Niet / Weinig / Matig / Veel

b. Tijdens **arbeid**: Niet / Weinig / Matig / Veel / nvt

4. Hoe was het weer (tijdens uw observaties)?



En met betrekking tot de wind:

(bijna) Windstil

Milde wind

Matige tot sterke wind

5. Hoe heeft u het gedrag van het paard vandaag ervaren?

Normaal alert / slomer / onrustiger / anders,

nl: _____

6. Heeft u andere opmerkingen?

Nee / Ja, nl:

Periode 3

Dag 6:

LET OP! BELANGRIJKE VRAAG

ONDERAAN! En morgenochtend is het extra belangrijk de tabletten WEL te geven in verband met het maken van het filmpje.

1. Is het gelukt de tabletten in te geven?
Ja / Nee; opmerking (waarom/hoeveel niet?): _____

2. Heeft het paard vandaag gewerkt? Met/zonder neusnetje (oid)?
Nee / Ja, namelijk: rijden/longeren/mennen, anders, nl. _____

3. Hoe heeft u het hoofdschudden vandaag ervaren?

a. In **rust**: Niet / Weinig / Matig / Veel

b. Tijdens **arbeid**: Niet / Weinig / Matig / Veel / nvt

4. Hoe was het weer (tijdens uw observaties)?



5. Hoe heeft u het gedrag van het paard vandaag ervaren?

Normaal alert / slomer / onrustiger / anders,
nl: _____

En met betrekking tot de wind:

(bijna) Windstil

Milde wind

Matige tot sterke wind

6. Heeft u andere opmerkingen?

Nee / Ja, nl:

7. Heeft het middel naar uw mening de afgelopen week effect gehad op het hoofdschudden van uw paard?

a. Nee

b. Ja, maar minder dan 50% vermindering van de klachten

c. Ja, het gaf 50-80% vermindering van de klachten

d. Ja, het gaf 80-100% vermindering van de klachten

e. Kan ik echt niet beoordelen, omdat

Periode 3

Dag 7:

Vandaag wordt het laatste filmpje gemaakt. U geeft vandaag de laatste tabletten met nummer 2 erop.

1. Is het gelukt de tabletten in te geven? **HOE LAAT 's ochtends?** _____

Ja / Nee; opmerking (waarom/hoeveel niet?) :

2. Heeft het paard, naast het maken van het filmpje, vandaag gewerkt? Met/zonder neusnetje (oid)?

Nee / Ja, namelijk: rijden/longeren/mennen, anders, nl.

3. Hoe heeft u het hoofdschudden vandaag ervaren?

a. In **rust**: Niet / Weinig / Matig / Veel

b. Tijdens **arbeid**: Niet / Weinig / Matig / Veel / nvt

4. Hoe was het weer (tijdens uw observaties)?



En met betrekking tot de wind:

(bijna) Windstil

Milde wind

Matige tot sterke wind

5. Hoe heeft u het gedrag van het paard vandaag ervaren?

Normaal alert / slomer / onrustiger / anders,

nl: _____

6. Heeft u andere opmerkingen?

Nee / Ja, nl:

7. Hoe heeft u de tabletten ingegeven? (beide weken hetzelfde?)
Los met krachtvoer / in slobber / anders, nl. _____

U krijgt bericht van de resultaten als we alle filmpjes en dagboeken hebben bekeken en
verwerkt.

Heel erg bedankt voor deelname aan het onderzoek!