

Determination of threshold concentrations of plant pollens in intradermal testing using fluorescein in clinically healthy nonallergic cats

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Background – Currently the same allergen concentrations for canine intradermal testing (IDT) are recommended for feline IDT. Feline skin reactions are subtle and more difficult to read than canine reactions. This difference may be due to suboptimal allergen concentrations used for IDT in cats.

Hypothesis/Objectives – To determine the irritant threshold concentration (ITC) of 16 pollen allergens using serial dilutions of allergen and intravenous fluorescein. The hypothesis tested was that feline IDT currently is performed at suboptimal allergen concentrations for pollens.

Animals – Twenty privately owned healthy clinically nonallergic cats.

Methods – IDT was performed in duplicate using 16 pollen allergens (weeds, grasses and trees) at a dilution of 8000 PNU/mL. Two blinded investigators graded the test reactions independently using subjective and objective criteria. Intravenous fluorescein was then administered and the test reactions were re-evaluated. IDT was repeated for any allergen that was positive, using serial dilutions of allergen at a concentration of 6000 and 4000 PNU/mL.

Results – The ITC for 2 of 16 of the allergens was determined. The ITC of *Cynodon dactylon* (Bermuda grass) and *Schinus* spp. (Peppercorn) was determined to be between 6000 and 8000 PNU/mL. The ITC of all other allergens tested in this study was >8000 PNU/mL.

Conclusions and clinical importance – This study confirms that suboptimal allergen concentrations currently are used for feline IDT as the ITC is >8000 PNU/mL for 14 of 16 of the grass, weed and tree pollens evaluated. The ITC of *Cynodon dactylon* and *Schinus* spp. was determined to be between 6000 and 8000 PNU/mL.

Introduction

Feline atopic syndrome (FAS) is a common disease causing pruritus and respiratory signs in affected cats.^{1,2} Intradermal testing (IDT) of allergens in cats can be used both to confirm a clinical diagnosis of FAS and to identify allergens for allergen avoidance and/or vaccine immunotherapy.³ Although the test is considered to be of value for the diagnosis of canine atopic dermatitis, it is used less widely for the diagnosis of FAS. Test reactions in cats are often subtle and can be more difficult to interpret than the skin reactions in dogs. Challenges with the IDT of cats arise because of poor and inconsistent wheal formation, an inability to assess test reactions due to rapid disappearance of the injected allergen solution, the use of non-standardized concentrations of allergens and the influence of patient stress.^{4–8}

The concentration of allergens used for IDT of dogs and cats is a subject of controversy in veterinary dermatology.^{5,6,9} Current recommendations for test concentrations of plant pollen allergens range from 1000 protein nitrogen units (PNU)/mL to 8000 PNU/mL for dogs and there are no specific recommendations published for cats.^{10,11} A concentration of 1000 PNU/mL typically has been used for grass, weed and tree pollens when testing cats but there is no evidence to support that these allergen concentrations accurately identify all cats with FAS.⁵

The irritant threshold concentration (ITC) of any allergen for IDT typically is determined by evaluating the lowest concentration at which at least 10% of normal patients react.^{8,12} Very few allergens have had their ITC determined for IDT in cats. One study reported that the ITC of flea antigen was 1:750 w/v and below 1000 PNU/mL for *Dermatophagoides farinae*, *Dermatophagoides pteronyssinus*, housefly, mosquito and moth in normal cats, but the exact irritant concentration was not determined. The same study failed to identify the ITC in 41 of 48 plant allergens tested. All ITCs were above 4000 PNU/mL, which was the highest concentration of allergen tested.⁵ These results suggest that the practice of using a test concentration of 1000 PNU/mL for plant

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pollen allergens for IDT cats with potential FAS may not be valid.

Intravenous (i.v.) fluorescein has been used to improve the accuracy of evaluation of intradermal test site reactions in cats. Typically 10% fluorescein sodium solution is administered at a dosage of 5 mg/kg i.v. immediately after test injections are completed.¹³ Test reactions are then interpreted in a dark room with the aid of a Wood's lamp and both fluorescent intensity and wheal diameter are evaluated. In a study of 10 normal cats, the measurement of fluorescent wheal diameter was more accurate than the semi-quantitative, subjective assessment of fluorescein intensity.⁶

The purpose of this study was to determine the ITC of pollen allergens used for IDT of 20 healthy nonallergic cats. Allergens were tested at a concentration of 8000 PNU/mL and serial dilutions of allergens from 4000 PNU/mL to 6000 PNU/mL were used for any allergen that had a positive reaction at 8000 PNU/mL. Intravenous 10% fluorescein sodium solution was used to assist with the interpretation of test reactions using both subjective and objective measurements.

Materials and methods

This was a prospective, double-blind and randomized study. The study protocol and owner consent forms were approved by the Animal Ethics Committee at the Animal Dermatology Clinic at Murdoch University, Western Australia.

Cats

Twenty privately owned, clinically healthy cats with no history of pruritus, skin or ear disease were enrolled in the study. All owners signed a written consent form. Cats must have been in the household for the previous 12 months. Exclusion criteria included a history of skin or ear disease, gastrointestinal signs (vomiting, flatulence, stool abnormalities) or upper respiratory disease (sneezing, snuffing or nasal discharge). The group included 10 castrated males and 10 spayed females with an age range from 15 months to 10 years and a weight range from 2.9 to 7 kg. There were 16 domestic short-haired and four domestic long-haired cats. No abnormalities were detected upon physical examination.

Allergens

Sixteen commercially available aqueous allergens (Greer Laboratories, Inc.; Lenoir, NC, USA) were used for IDT. The allergens included five grasses, five weeds and six trees (Table 1.) These 16 allergens were selected from the standard cohort of 71 allergens used for IDT of cats and dogs at the Animal Dermatology Clinic in Western Australia; they accounted for the eight most and least reactive pollens identified in 29 cats with FAS tested using these allergens at 1000 PNU/mL.

Intradermal allergen testing

All IDT was performed by a technician blinded to the allergens being injected at randomized test sites. Prior to testing, a number between

1 and 18 was allotted at random to each allergen including histamine and saline. A test pattern was generated by assigning the numbers 1–18 (that corresponded with the allergens) at random in duplicate across a paper model of the test site divided into four quadrants. Duplicates had to be allocated into the same test quadrant to minimize the possible effect of location on reaction size. The order of all duplicate antigen injections including blinded saline and histamine was randomized between quadrants of the lateral thorax for each individual cat. This resulted in a situation where no cat would have the exact same test pattern on a testing day.

Cats were sedated using 70 µg/kg medetomidine (Domitor, Pfizer; Exton, PA, USA) intramuscularly. An i.v. catheter was then placed into the cephalic vein. The hair over the left ventrolateral thorax was clipped. Each cat was intradermally injected using a 27-gauge needle with 0.05 mL of 16 allergens including the blinded saline and histamine in duplicate across the four quadrants. Saline (0.9% phosphate buffered saline) and histamine solution (0.1 mg/mL) were used as the negative and positive controls, respectively, and were injected at the first and last two sites. Duplicates of saline and histamine were injected at randomized locations throughout the test to allow for determination of intraobserver and interobserver reliability.

Two investigators independently evaluated the IDT sites consecutively 12–18 min after the injections were administered. The test reactions were evaluated using a subjective scoring system of 0 to 4+ based on evaluation of erythema, turgidity, size and steepness of the wheal, and an objective measurement of the wheal diameter (width in mm) using a ruler. The diameter of the test sites was measured across a round wheal or the smaller dimensions of an oval wheal. Initially, a reaction was considered positive when allocated a 3+ or 4+ or when the diameter of a wheal and/or erythema formation was equal to or greater than the mean between the negative and positive control. A score of 3+ was allocated when the diameter of the test site was 50–75% greater than the mean of the diameter of the histamine and saline wheal and >75% for a 4+ reaction.

Immediately after both investigators had interpreted the test the technician injected 5 mg/kg of 10% fluorescein sodium solution via an i.v. catheter. The test site was then independently re-evaluated and graded using a subjective score of the intensity of the dye from 0 to 4+ and an objective measurement using the diameter of the fluorescein wheal. Any pollen allergen that had a positive reaction of 3+ or greater in duplicate on the same cat was further tested using serial dilutions of allergen at 6000 PNU/mL and 4000 PNU/mL. The dilutions were also injected in duplicate in a blinded to investigator, randomized, pattern. These sites were evaluated in the previously described manner. After the testing was completed, sedation was reversed by injecting 0.35 mg/kg of atipamazole (Antisedan; Pfizer) intramuscularly.

Statistical analysis

Statistical analyses to compare intra- and interobserver IDT results with and without fluorescein were evaluated using the Statistical Analysis System (SAS) v.9.2 9 (Cary, NC, USA) computer programme. The ITC was defined as the lowest concentration at which ≥10% of cats (≥2 of 20 cats) reacted with a positive test reaction.

Results

Blinded versus known controls

The intertest, intrainvestigator and interinvestigator raw agreement was high between the known and blinded

Table 1. Allergens used for IDT in the 20 nonallergic cats

Weeds	Grasses	Trees
1. <i>Taraxacum officinale</i> (Dandelion)	6. <i>Cynodon dactylon</i> (Bermuda Grass)	11. <i>American and Siberian</i> (Elm Mix)
2. <i>Eupatorium capillifolium</i> (Dog Fennel)	7. <i>Phalaris arundinacea</i> (Canary Grass)	12. <i>Betula populifolia</i> (Grey/Silver Birch)
3. <i>Chenopodium album</i> (Lambs Tongue)	8. <i>Sorghum halepense</i> (Johnson Grass)	13. <i>Melaleuca quinquenervia</i> (Melaleuca)
4. <i>Rumex acetosella</i> (Red (Sheep) Sorrel)	9. <i>Poa pratensis</i> (Kentucky Blue)	14. <i>Loblolly, White, Yellow</i> (Pine Mix)
5. <i>Ambrosia artemisiifolia</i> (Short Ragweed)	10. <i>Agrostis gigantea</i> (Red Top Grass)	15. <i>Schinus</i> spp. (Peppercorn)
		16. <i>Juniperus osteosperma</i> (Utah Juniper)

Table 2. Comparison of intertest and intrainvestigator results for the 20 cats using blinded versus known controls

Controls	Number of matched pairs	Raw agreement %	Pooled SD
Histamine	80	93.75	0.18
Saline	80	92.5	0.37

SD, Standard deviation.

Table 3. Comparison of interinvestigator and intertest results for blinded and known controls

Controls	Raw agreement %	Pooled SD
Known histamine	98	0.11
Blinded histamine	95	0.16
Known saline	98	0.11
Blinded saline	90	0.51

SD, Standard deviation.

duplicate control pairs (Table 2 and 3). The known histamine and saline results were higher than the blinded controls.

Defining a positive reaction

Interinvestigator and intertest agreement was highest and standard deviation the lowest with grades of zero and 4+ (Table 4). All grades demonstrated stronger intertest agreement than interobserver agreement except for 1+ reactions, which demonstrated 0% agreement for both categories. These results demonstrate that there is poor agreement between investigators and tests for scores graded as 1+, 2+ or 3+ reactions. The 3+ reactions only had an 8% and 22% interinvestigator and intertest agreement, respectively. Given the low agreement and repeatability between results a positive reaction was defined as only those that were graded as 4+ in duplicate.

Allergen threshold concentrations

The $\geq 10\%$ cut-off to establish ITCs was determined for *Schinus* spp. and *Cynodon dactylon* to be between 6000 and 8000 PNU/mL (Table 2). In two of 20 cats (10%) there was a 4+ reaction scored by both investigators for subjective and objective parameters with and without fluorescein for *Schinus* spp. and *Cynodon dactylon* injected in duplicate. Serial dilutions were performed for both of these allergens and no reactions were recorded at 6000 PNU/mL. For all other allergens tested, the ITC could not be determined and was at least 8000 PNU/mL. In our study, no adverse reactions to i.v. administration of fluorescein were observed. All cats recovered uneventfully.

Quadrants

No correlation or statistical relationship between the location of the allergen injection between the quadrants and test reactivity was determined.

Discussion

The appropriate concentration at which to perform IDT in dogs and cats is controversial. Allergens should be tested at their threshold concentrations. If the concentration of an allergen is tested at below its threshold concentration, allergic individuals may fail to react, resulting in false negative results.¹²

Optimal allergen concentrations for IDT in cats have not been well investigated.⁵ A study using 24 aqueous pollen allergens (Greer Laboratories Inc.) evaluated 50 nonallergic cats and could not determine the optimal ITC for any allergen tested. The maximal allergen concentration tested in that study was 1500 PNU/mL. Despite this result, the authors concluded that 1000 PNU/mL was the appropriate concentration to use for grass, weed and tree pollens for feline IDT.¹⁴ Our study strongly contradicts these recommendations; we utilized two allergens – *Che-nopodium album* (Lambs Tongue) and *Rumex acetosella* (Red Sorrel) – evaluated in the earlier study and could not elicit a positive test reaction for either allergen despite increasing the allergen concentration eight-fold.

Another study evaluating the ITC for *Cynodon dactylon* evaluated 30 cats using serial allergen dilutions but the ITC was not established, as the highest concentration used for testing was only 4000 PNU/mL.⁵ To the best of the authors' knowledge, no studies have evaluated the ITC for *Schinus* spp. allergen in cats. Our study confirmed that no cats reacted when both *Cynodon dactylon* and *Schinus* spp. were tested at 6000 PNU/mL and 10% of cats reacted when *Cynodon dactylon* and *Schinus* spp. were tested at 8000 PNU/mL. Therefore, *Cynodon dactylon* and *Schinus* spp. have an ITC of between 6000 and 8000 PNU/mL. *Cynodon dactylon* was the most frequent pollen reaction in the 29 FAS skin tests reviewed, based on IDT at 1000 PNU/mL and is therefore an important allergen for FAS cases in Australia.

In this study, the ITC could not be determined for the majority (14 of 16) of pollen allergens tested. To the best of the authors' knowledge, this is the only study to perform IDT on cats in a blinded duplicate method using allergen concentrations of 8000 PNU/mL. Our study suggests that feline IDT using Greer aqueous allergens has been performed using suboptimal pollen allergen concentrations for evaluating cats with FAS.

This study demonstrates that intertest and interobserver agreement using subjective grading criteria (including fluorescein intensity) for evaluating feline test reactions are most reproducible when the reactions are graded either 0 or 4+. Subjective scoring appears to be reliable only when the test sites are equal to either the positive or negative control. Given the poor intertest and

Table 4. Raw agreement and pooled SD compared by test grade for all allergens including (histamine and saline pairs)

Intradermal test grade	Number of pairs	Interinvestigator agreement (%)	Intertest agreement (%)	Interinvestigator Pooled SD (%)	Intertest Pooled SD (%)
0	699 (Inv) 694 (T)	88	89	0.55	0.54
1	6 (Inv) 6 (T)	0	0	0.87	0.71
2	76 (Inv) 69 (T)	7	17	1.32	1.26
3	37 (Inv) 32 (T)	8	22	1.61	1.66
4	85 (Inv) 83 (T)	92	95	0.24	0.16

SD, Standard deviation; Inv, Investigator pairs; T, Test pairs.

interobserver reproducibility of 2+ and 3+ reactions, the authors strongly recommend only a 4+ grade be considered a positive reaction when using subjective criteria to evaluate feline IDT. Objective measurement of the diameter of the wheal axis appears to increase the interobserver and intertest reliability, especially for those reactions which are more challenging to interpret.

Previous studies suggest that the readability and hence interpretation of test reactions in cats is enhanced after i.v. administration of 10% fluorescein solution.⁶ In this study, 2 of 20 cats (10%) had positive reactions to *Schinus* spp. allergen on the basis of both fluorescein wheal diameter and staining intensity that would have otherwise been negative if subjective criteria were used without the administration of fluorescein. The administration of i.v. fluorescein appears to be well tolerated and safe. A case of anaphylaxis subsequent to i.v. administration of 10% fluorescein has been reported; however, an approximate five-fold increase in the dose of 10% fluorescein was administered in comparison to that used in our study.¹³ In this light, the authors strongly recommend the use of i.v. administration of 5 mg/kg 10% fluorescein solution for IDT in cats with no adverse events recorded.

Previous studies have recommended using a histamine concentration ranging from 0.05 to 0.1 mg/mL for the positive control in feline IDT.^{5,15} Our study used a histamine concentration of 0.1 mg/mL. One study suggests that wheal reactions are more difficult to interpret at this concentration, but the study did not utilize i.v. fluorescein and investigators were not blinded to the location of any of the allergen injections. Our interobserver agreement for all the histamine positive control injections was 93.75% and the authors recommend using a concentration of histamine at 0.1 mg/mL for IDT in cats.

There are some limitations of this study. To the best of the authors' knowledge, the use of late phase reactions for determining ITCs has not been reported in this species and these were not evaluated in our study. Although Greer allergens were used in all cats, two separate batches of allergens were utilized. The authors acknowledge that the biological potency of allergens can vary between batches but no discrepant positive reactions were observed.

In conclusion, 14 of 16 plant pollen allergens failed to react when tested at 8000 PNU/mL using i.v. fluorescein and the ITC could therefore not be determined. The authors recommend that these allergens are tested at 8000 PNU for feline IDT. The ITC for *Schinus* spp. and *Cynodon dactylon* is between 6000 PNU/mL and 8000 PNU/mL and the authors recommend that these allergens are tested at 6000 PNU. Further studies to identify the ITC for plant pollens allergens in cats are indicated.

Résumé

Contexte – Actuellement, les mêmes concentrations d'allergènes pour les tests intradermiques canins (IDT) sont recommandées pour les IDT du chat. Les réactions cutanées félines sont subtiles et plus difficiles à interpréter que les réactions canines. Cette différence peut être liée aux concentrations suboptimales utilisées pour les IDT chez le chat.

Hypothèses/Objectifs – Déterminer la concentration seuil irritante (ITC) pour 16 allergènes de pollens en utilisant des dilutions sériques d'allergènes et la fluorescéine intraveineuse. L'hypothèse testée était que les IDT du chat sont à ce jour réalisées à l'aide de concentrations d'allergènes suboptimales pour les pollens.

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Sujets – Vingt chats non allergiques sains de propriétaires.

Méthodes – Les IDT ont été réalisées en doublon avec 16 allergènes de pollen (graminées, herbacées, arbres) à une dilution de 8000 PNU/mL. Deux investigateurs en aveugle, ont noté les réactions des tests indépendamment à l'aide de critères objectifs et subjectifs. La fluorescéine intraveineuse a été administrée et les réactions aux tests réévaluées. Les IDT ont été répétés pour chaque allergène positif, à l'aide de dilutions sériques d'allergènes et à des concentrations de 6000 à 4000 PNU/mL.

Résultats – L'ITC pour 2 des 16 allergènes a été déterminé. L'ITC de *Cynodon dactylon* (Bermuda grass) et *Schinus spp.* (Peppercorn) a été déterminée entre 6000 et 8000 PNU/mL. L'ITC de tous les autres allergènes testés dans cette étude était >8000 PNU/mL.

Conclusions et importance clinique – Cette étude confirme que les concentrations d'allergènes utilisées actuellement pour les IDT du chat sont suboptimales et que l'ITC est >8000 PNU/mL pour 14 des 16 pollens de graminées, herbacées et arbres évalués. L'ITC pour *Cynodon dactylon* et *Schinus spp.* a été déterminée comme étant entre 6000 et 8000 PNU/mL.

Resumen

Introducción – actualmente las concentraciones de alérgenos recomendadas para las pruebas intradérmicas felinas y caninas (IDT) son iguales. Las reacciones en la piel de gatos son muy leves y más difíciles de leer que las reacciones caninas. Esta diferencia puede ser debida una concentración subóptima de alérgenos utilizados en la IDT en gatos.

Hipótesis/Objetivos – determinar la concentración mínima irritante (ITC) de 16 alérgenos de polen utilizando diluciones seriadas de alérgeno y fluoresceína intravenosa. La hipótesis a probar era que las pruebas intradérmicas felinas actualmente están siendo desarrolladas con concentraciones subóptimas de alérgeno para el polen.

Animales – 20 gatos de propietarios privados sanos y no alérgicos.

Métodos – se desarrollaron pruebas de IDT en duplicado utilizando 16 alérgenos de polen (malas hierbas, gramíneas y árboles) a una dilución de 8000 PNU/mL. Dos investigadores evaluaron las reacciones de las pruebas sin saber su origen y de forma independiente utilizando criterios subjetivos y objetivos. La fluoresceína intravenosa fue entonces administrada y las reacciones se re-evaluaron. Las IDTs fueron repetidas para los alérgenos que eran positivos utilizando diluciones seriadas de alérgeno a concentraciones de 6000 y 4000 PNU/mL.

Resultados – la ITC de dos de los 16 alérgenos fue determinada. La ITC para *Cynodon dactylon* (grama común) y *Schinus spp.* (pimenteros) fue determinada entre 6000 y 8000 PNU/mL. La ITC de los otros alérgenos probados en este estudio fue mayor de 8000 PNU/mL.

Conclusión e importancia clínica – este estudio confirma que actualmente se están utilizando concentraciones de alérgenos subóptimas para las IDT felinas ya que la ITC es mayor de 8000 PNU/mL para 14 de los 16 pólenes evaluados. La ITC de *Cynodon dactylon* y *Schinus spp.* fue determinada entre 6000 y 8000 PNU/mL.

Zusammenfassung

Hintergrund – Zurzeit werden dieselben Allergenkonzentrationen, die für den Intradermaltest beim Hund (IDT) verwendet werden, auch beim IDT der Katze verwendet. Die Hautreaktionen der Katzen sind gering und schwieriger zu lesen, als die Reaktionen beim Hund. Dieser Unterschied könnte seine Ursache in der Verwendung suboptimaler Allergenkonzentrationen beim IDT der Katzen haben.

Hypothese/Ziele – Eine Bestimmung der irritierenden Schwellenwertkonzentrationen (ICT) von 16 Pollenallergenen mittels Reihenverdünnung von Allergen und intravenösem Fluorescein. Die untersuchte Hypothese besagte, dass derzeit der IDT bei Katzen mit suboptimalen Allergenkonzentrationen für Pollen durchgeführt wird.

Tiere – Zwanzig gesunde, klinisch nichtallergische Katzen aus privater Hand.

Methoden – Es wurde ein IDT im Duplikat durchgeführt, wobei 16 Pollenallergene (Kräuter, Gräser und Bäume) bei einer Verdünnung von 8000 PNU/mL verwendet wurden. Zwei geblindete Untersucher bewerteten die Testreaktionen unabhängig mittels subjektiver und objektiver Kriterien. Danach wurde intravenös Fluorescein verabreicht und die Testreaktionen nochmals evaluiert. Für jedes positive Allergen wurde der IDT mittels Reihenverdünnung des Allergens bei einer Konzentration von 6000 und 4000 PNU/mL wiederholt.

Ergebnisse – Der ITC von 2 der 16 Allergene wurde bestimmt. Der ITC von *Cynodon dactylon* (Bermudagrass) und *Schinus spp.* (Pfefferkorn) wurde zwischen 6000 und 8000 PNU/mL festgestellt. Der ITC aller anderen Allergen, die in dieser Studie getestet wurden lag bei > 8000 PNU/mL.

Schlussfolgerungen und klinische Bedeutung – Diese Studie bestätigt, dass zurzeit suboptimale Allergenkonzentrationen für den IDT der Katzen im Einsatz sind, da die ITC bei > 8000 PNU/mL für 14 der 16 evaluierten Gräser-, Kräuter- und Baumpollen liegt. Der ICT von *Cynodon dactylon* und *Schinus spp.* wurde zwischen 6000 und 8000 PNU/mL festgestellt.

要約

背景 — 現在、イヌ皮内反応(IDT)と同じアレルゲン濃度がネコのIDTに推奨されている。ネコの皮膚反応は繊細でイヌの反応より判断するのが困難である。この差はネコのIDTに使用される準最適なアレルゲン濃度に起因するかもしれない。

仮説/目的 — 16種類の花粉アレルゲンの刺激限界濃度(ITC)をアレルゲンおよび静脈内蛍光色素の系列希釈法を用いて決定すること。検査された仮説は現状のネコIDTでの花粉に対する準最適アレルゲン濃度で行われた。

供与動物 — 個人飼育されている健康で臨床的にアレルギーのないネコ20頭。

方法 — 16種類の花粉アレルゲン(雑草、芝ならびに樹木)を8000 PNU/mlに希釈した液体を用いて、IDTを2回実施した。2人の盲検化された調査員が個別に、試験反応を主観的および客観的基準を用いて採点した。静脈内蛍光色素はその後投与され、試験反応は再評価された。IDTは陽性を示したアレルゲンすべてで、アレルゲンを6000 および 4000 PNU/mLの濃度にアレルゲンの系列希釈法を用いて繰り返された。

結果 — 16種類のアレルゲンの内2種類に対するITCが測定された。*Cynodon dactylon*(ギョウギンバ)および*Schinus spp.* (コショウの実)で6000から8000 PNU/mLの間であることが測定された。この試験で検査した他のアレルゲンすべてのITCは8000 PNU/mL以上であった。

結論および臨床的な重要性 — この研究により、ネコのIDTに対して現在使用されている準最適化したアレルゲン濃度であるITCは16種類の芝、雑草、および樹木の内14種類で8000 PNU/mL以上であることを確認した。*Cynodon dactylon*および*Schinus spp.*のITCは6000から8000 PNU/mLの間であることが測定された。

摘要

背景 — 当前犬用皮内试验(IDT)过敏原浓缩剂,同样推荐用于猫IDT。猫皮肤反应细微,比犬的反应难判读。这可能是用于猫的IDT过敏原浓缩剂未达最佳浓度。

假设/目的 — 运用连续稀释过敏原法和静脉内荧光素法,确定16种花粉过敏原刺激物阈值浓度(ITC)。该假设试验基于目前猫IDT花粉过敏原浓缩剂浓度不适宜。

动物 — 20只个人饲养、临床表现健康无过敏症的猫。

方法 — 用16种花粉过敏原(野草、禾本植物以及树木)进行IDT,浓度为8000 PNU/mL。判读者双盲使用主观和客观标准独立对测试反应进行评级。随后进行静脉内荧光素试验,对结果进行再评估。将阳性过敏原重复做IDT试验,通过连续稀释法,将过敏原浓度降为6000和4000 PNU/mL。

结果 — 确定了16个中的2个过敏原的ITC。百慕大草和胡椒的ITC在6000至8000 PNU/mL间。其他所有过敏原ITC在本次试验中均大于8000 PNU/mL。

总结与临床意义 — 本次实验显示,目前用于猫IDT的16种野草、禾本植物及树木花粉的过敏原浓缩剂未达到最佳,因其ITC大于8000 PNU/mL。百慕大草和胡椒的ITC在6000至8000 PNU/mL之间。

Resumo

Contexto — É crescente o interesse nas fibras nervosas intraepidérmicas (IENFs) na medicina humana, pois variações na densidade destas fibras ocorre em algumas doenças e estas neurites podem contribuir para a patogênese da doença. O aumento da densidade de IENFs é observado em humanos com dermatite atópica (DA). Não existem dados sobre este assunto em cães atópicos.

Objetivos — Comparar a prevalência de IENFs na pele normal e pele atópica de cães.

Métodos — Foram realizadas biópsias cutâneas com punch de 8mm de seis áreas de 25 cães normais sem dermatopatias e comparadas a amostras lesionais e alesionais de cães com DA (23 e 14 cães, respectivamente). Blocos de parafina de 30 micrômetros foram corados para imunofluorescência indireta para a beta-3 tubulina neuronal. Apenas os blocos com nervos dérmicos identificados foram testados para a presença de IENFs.

Resultados — IENFs foram detectadas em todos os 25 blocos de plano nasal normal, mas apenas em uma amostra de biópsia coletada de cada área de pele hirsuta de cães normais (PHCN). Como não houve diferença significativa na prevalência de IENFs em entre as áreas de PHCN, elas foram agrupadas em conjunto. O grau de identificação de IENFs foi significativamente maior (one tailed Fisher's test, $P = 0.004$) nos espécimes de DA lesional (18 of 23; 78%) que na DA alesional (quatro de 14; 29%) e nos espécimes PHCN (quatro de 111; 4%, $P < 0.0001$). A prevalência de IENFs nas amostras de DA alesional foi significativamente maior que na pele de cães normais ($P = 0.006$).

Conclusões — As IENFs são detectadas mais comumente em DA canina que na pele hirsuta normal. Estes resultados são comparáveis aos observados em humanos com DA.