Welcome to the 10th World Congress of Veterinary Dermatology
July 2024 | Boston, Massachusetts

The Executive Organizing Committee cordially invites you to join us in beautiful Boston, Massachusetts for the 10th World Congress of Veterinary Dermatology (WCVD10) to be held in July 2024. The World Congress has not been in the USA since WCVD4 in 2000 and it seems fitting to have such a historic city as the venue for WCVD10.

Boston is easy to get to and a world-class destination with endless possibilities to explore and truly has something for everyone. We look forward to you joining us!
Promoting the Worldwide Advancement of Veterinary Dermatology

Clinical Consensus Guidelines
World Congress Veterinary Dermatology
North American Veterinary Dermatology Forum April 2021
Background

• WAVD Role
  • Support the WCVD, site selection and appointing president and chair selections
  • Principal sponsor for WCVD
  • Scholarships
  • Assists and encourages the multinational organizations
  • Fund activities of ICADA
  • Development of Clinical Consensus Guidelines
Member Organizations

- American Academy of Veterinary Dermatology (AAVD)
- American College of Veterinary Dermatology (ACVD)
- Asian Society of Veterinary Dermatology (AJSVD)
- Canadian Academy of Veterinary Dermatology
- European College of Veterinary Dermatology (ECVD)
- European Society of Veterinary Dermatology (ESVD)
- Society of Lepidodermatologists (SLEDV)
- Scottish Lepidodermatologists (SLDV)
- Dermatology Chapter of the Australian and New Zealand College of Veterinary Scientists (AicVD)
- World Association for Veterinary Dermatology (WAVD)
Affiliate and Provisional Organizations

ICADA | International Committee on Allergic Diseases of Animals

International Society of Veterinary Dermatopathology
Advancement of veterinary and comparative dermatopathology

GVDEG
GLOBAL VETERINARY DERMATOLOGY EDUCATION GROUP

ADVT
Academy of Dermatology Veterinary Technicians
Background

• WAVD orchestrated the development of Clinical Consensus Guidelines (CCGs)
  • Wayne Rosenkrantz
  • Catherine Outerbridge

• Guidelines are a combination of analysis of evidence-based material and a consensus opinion of experts

• Commonly encountered skin diseases

• Enlisted academic and clinical experts

• Recommendations made based on evidence based when possible

• Publication of these guidelines
Background

Diagnosis and treatment of dermatophytosis in dogs and cats.
Clinical Consensus Guidelines of the World Association for Veterinary Dermatology
Karen A. Morello*, Kimberly Coyner†, Susan Paterson‡ and Bernard Mignon§

Recommendations for approaches to meticillin resistant staphylococcal infections of small animals: diagnosis, therapeutic considerations and preventative measures.
Clinical Consensus Guidelines for the World Association for Veterinary Dermatology
Daniel O. Morris*, Anette Loeffler‡, Meghan F. Davis*, Luca Guardabassi§ and J. Scott Weese†

Biology, diagnosis and treatment of *Malassezia* dermatitis in dogs and cats
Clinical Consensus Guidelines of the World Association for Veterinary Dermatology
Ross Bond**, Daniel O. Morris, Jacques Guillot ... See all authors

Diagnosis and treatment of demodicosis in dogs and cats
Clinical consensus guidelines of the World Association for Veterinary Dermatology
Ralf S. Mueller**, Wayne Rosenkrantz, Emmanuel Bensignor ... See all authors
Background

• Topics 2021
• Otitis: Best Clinical Practices
  • Jim Noxon- Chair
• Equine Hypersensitivities
  • Rosanna Marsella- Chair
Background

• Consensus Statements presented today
• Consensus Statements and draft of full manuscript available for feedback after September 15, 2021
• WAVD Web Site http://www.wavd.org/
  • http://www.wavd.org/papers-for-review.html
WAVD Clinical Consensus Guidelines for Equine allergic skin diseases

Rosanna Marsella
University of Florida
Consensus Guidelines for equine allergic skin disease

• Wayne Rosenkrantz (USA)
• Catherine Outerbridge (USA)
• Ralf Mueller (Germany)
• Valerie Fadok (USA)
• Stephen White (USA)
• Doug Wilson (UK)
• Rosanna Marsella (USA)
Approach to the development of Consensus Guidelines

• Literature search for studies on equine allergies and equine urticaria published between 1950 and 2021
  • Total of 1,592 results
  • When narrowed down for insect bite hypersensitivity and horses
    • 190 results
  • When narrowed down to atopic dermatitis and horses
    • 86 results
  • When narrowed down to food allergy and horses
    • 5 results

• When no published evidence or contrasting study results
  • Expert consensus
Allergic skin diseases covered in the current Consensus Guidelines

- Insect Bite Hypersensitivity (IBH)
- Atopic dermatitis (aka environmental allergies)
- Food allergy
Insect Bite Hypersensitivity (IBH)

Importance and Risk factors
Importance of IBH and impact on equine welfare

- IBH recognized in multiple studies as the leading allergic skin disease worldwide
- Many helpful recently published reviews of the current state of knowledge on IBH
Current understanding on the pathogenesis of IBH

• **Multifactorial disease** resulting from the **combination of genetic and environmental factors** which contribute to the onset and perpetuation of the disease

• In the past, multiple causes ranging from parasites to fungi had been postulated to trigger the disease

• Currently, we know that the disease is caused by an allergic response to insect bites (**Culicoides** being the most common)
  • Primary causes are **allergens in the saliva of Culicoides** but other blood-feeding insects can also cause allergic responses
Factors associated with IBH

- Endogenous (host)
- Exogenous (environmental)

Table 1
Factors influencing the prevalence of insect bite hypersensitivity.

<table>
<thead>
<tr>
<th>Impact of</th>
<th>Reference</th>
</tr>
</thead>
</table>
| Habitat            | Bjornsdottir et al. (2006), van Grevenhof et al. (2007) and Steinman et al. (2003)  
                     van Grevenhof et al. (2007)                                                  |
| Climate            | Wilson et al. (2001), Wagner et al. (2003) and Steinman et al. (2003)        |
| Age                | Riek (1953a) and Anderson et al. (1988)                                     |
| Breed              | Halldorsdottir et al. (1991), Marti et al. (1992), Lazary et al. (1994), Eriksson et al. (2008), Andersson et al. (2011) and Schurink et al. (2009, 2011) |
Factors considered

• **Geographical location** (variable prevalence depending on location)
  • 3% in some parts of Great Britain – 60% in some parts of Australia

• **Habitat and climate**

• **Coat color**
  • Chestnut and gray considered at lower risk than black or bay
    • Results of various studies are conflicting

• **Time of exposure in the life of the individual** (eg. lack of exposure to insects in early years)
  • Icelandic horses moving to Europe later in life (> 50% prevalence) vs. offspring of Icelandic horses born in Europe (5%)
Genetic factors

• IBH Described in all breeds
  • Genetic predisposition studied in several breeds
• Heritability estimated to be low and range from 0.08 to 0.3
• MHC reported to contribute in Friesians
Several genome-wide association studies published

• Candidate genes reported
  • Equine leukocyte antigen (ELA) class II region
  • non-ELA genes regulating immunity and allergy
  • Associated regions in *E. caballus* (ECA) 1, 3, 15 and 18
  • AQR (Aquarius Intron-Binding Spliceosomal Factor) gene involved in splicing processes
• Shrestha et al aimed to identify and validate SNPs associated with IBH susceptibility
  • The authors confirmed the **polygenetic nature of IBH susceptibility** and suggested a role of transcriptional regulatory mechanisms for IBH predisposition
Consensus statement about risk factors for IBH

- IBH is **multifactorial** with environmental and genetic factors playing a role
- Current knowledge of genetic risk factors support the **polygenetic** nature of IBH
- Lack of exposure to insects in the early stages of life appears to predispose to the development of allergies in adulthood
Insect Bite hypersensitivity

Pathogenesis
Evidence to support a role for IgE

- Numerous studies have supported the presence of **allergen specific IgE in the serum of IBH horses**
  - Reactivity to *Culicoides* can be transferred to normal horses with serum from affected horses, confirming the hypersensitivity reaction
- **Intradermal injection of *Culicoides extracts*** provokes a skin reaction in 80% of IBH horses
- Documentation of **IgE-bearing cells in the skin biopsies** of horses with IBH with increased frequency when compared to healthy controls
Identification of proteins in *Culicoides* saliva to which IBH horses react

- Several conserved antigens in *Culicoides* saliva have been identified such as maltase, hyaluronidase, antigen-5, D7 or Kunitz protease inhibitors

- With the aim to improve allergen immunotherapy, numerous *Culicoides* allergens have been produced as recombinant (r-) proteins
IgE levels to 27 different r-allergens were determined
   • 199 *Culicoides* hypersensitive and 148 controls

IgE for 25/27 r-allergens was higher in IBH horses compared to controls

9 r-allergens were recognized as “major allergens”
   • 7/9 were able to bind IgE in sera from more than 70% of allergic horses

Combination of these top 7 r-allergens could diagnose > 90% of IBH-affected horses with a specificity of > 95%
IgG

- IgG antibodies to *Culicoides* salivary gland antigens are also detected, not only in the serum from IBH-affected horses but in ALL horses exposed to *Culicoides*
• Increase in allergen specific IgE was concurrent with the initial onset of clinical signs of IBH

• Increase of IgG5 occurred before clinical signs and could have predictive value
Consensus statement on IgE in IBH

• A role for IgE is widely accepted in the pathogenesis of IBH
• Much progress has occurred in the identification of relevant allergens in IBH horses
  • Currently 9 Culicoides allergens are recognized as “major allergens”
• A need for standardization of nomenclature exists to avoid confusion
  • Future large scale studies are needed to define more precisely which allergens are important in different geographical locations
Cellular immune response in IBH

• Studies on biopsies after injection of Culicoides allergen in IBH and normal horses
  • Lymphocytic influx and IL-4 production after 24 hours (higher in IBH horses than normal horses)
  • Upregulation of IFN-gamma only in normal horses

• Studies on biopsies of naturally occurring disease
  • Elevated numbers of CD4+ T cells, Langerhans cells and eosinophils in IBH horses
  • Imbalance in T cell populations with reduction of regulatory cells
  • Increased mRNA expression levels for IL-13 (not for IL-4)
• General up-regulation of cytokine responses in the skin of horses during *Culicoides* season both in IBH and control horses

• Authors emphasized the need to re-evaluate published studies taking into account the seasonal influences when evaluating the immune status of the skin
Peripheral blood lymphocytes in IBH

- **IBH horses** have **higher numbers of IL-4+ cells** compared to normal.
- **Healthy horses** have **increased regulatory cells**
  - IL-10 and TGF-beta have a role in down-regulating TH2 cells.

- Studies in vitro have reported on **stimulation of antigen-specific Th1 and IL-10 producing Treg cells in IBH horses** using recombinant allergens.
  - Promising for future studies on IT.
Consensus statement on cellular immune response in IBH

• A skewed lymphocytic response with increased TH2 and decreased regulatory T cells exists in IBH horses
• TH1 response is considered protective against IBH
Investigation on role of skin barrier in IBH

PLOS ONE

RESEARCH ARTICLE

Investigating the epithelial barrier and immune signatures in the pathogenesis of equine insect bite hypersensitivity

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PLOS ONE | https://doi.org/10.1371/journal.pone.0253210 | April 28, 2020
Transcriptome of whole skin

- IBH-horses lesional (IBH-LE; n = 9) vs. non-lesional skin (IBH-NL; n = 8) and compared to healthy control horses (H; n = 9).
  - **Lesional skin** had transcriptomic differences compared to **healthy controls**
    - Downregulation of genes involved in tight junction formation, alterations of keratins and upregulation of IL-13
  - **Non lesional IBH skin** had some differentially expressed genes but **was closer to healthy skin**
Transcriptome of epidermis

• **Non-lesional** epidermis in IBH-horses (EPI-IBH-NL; n = 10) in comparison with **healthy** epidermis from controls (EPI-H; n = 9)
  
  • Genes involved in metabolism of **epidermal lipids, pruritus, as well as IL25**, were significantly differentially expressed between EPI-IBH-NL and EPI-H

  • Authors concluded that results suggest impairment in epithelial barrier in IBH horses

  • No evaluation of skin barrier function done in these horses

  • Possible that some of the IBH horses used in this study were also atopic....
Studies on TEWL in horses

• Very few studies and **none on IBH horses**
Consensus statement on skin barrier dysfunction in IBH

• Due to paucity of studies it is not possible to make a conclusion on the importance of skin barrier in horses with IBH

• More studies are needed to further examine this topic and to identify how many IBH horses are also atopic
  • It is possible that IBH is one of the manifestations of atopic trait
Coexistence of IBH and atopic traits

• Several studies reporting association with respiratory disease
Allergen-specific immunoglobulin E in sera of horses affected with insect bite hypersensitivity, severe equine asthma or both conditions

Maëva Verdon¹ | Simone Lanz¹ | Claudio Rhyner² | Vinzenz Gerber¹ | Eliane Marti³

Conclusions and Clinical Importance: Susceptibility of IBH-affected horses to develop EA is likely not associated with IgE-mediated immune reactions but with other immunopathological mechanisms.
Consensus statement

• IBH can be associated with equine asthma
  • More studies are needed to understand the mechanisms of co-existence of these diseases
Insect Bite hypersensitivity

Clinical signs
• Intense pruritus and papular eruption
• Self-trauma leads to hair loss, excoriations and frequent secondary infections
• Face, ears, dorsal midline (base of the mane, tail), ventral midline, legs are all reported sites that can be affected in IBH horses
Formation of hard nodules (eosinophilic granulomas) can be a significant problem in some IBH horses.
Consensus statement about clinical signs

• IBH is **a very pruritic** disease
• Eosinophilic granulomas, hives, and pruritic papular eruptions can be seen in horses with IBH
• Distribution of signs often reflect the feedings sites of the *Culicoides* present in the area
• Secondary infections are common and increase the level of pruritus
Insect Bite hypersensitivity

Diagnosis
Diagnosis of IBH

• Still a clinical diagnosis

• Despite the progress made with in vitro tests, diagnosis in clinical practice is still best accomplished by using a combination of elements such as history, clinical signs, and positive response to insect repellents

• **Allergy testing** should be used as minor criteria
  • positive results may be seen in horses that are clinically unaffected
  • **positive results simply indicate that the horse is sensitized** but do not necessarily indicate that that is the cause of the clinical signs
  • 1/1000 w/v concentration is suggested for skin testing
Consensus statement about diagnosis of IBH

- Diagnosis of IBH is a **clinical diagnosis** based on compatible history and clinical signs and exclusion of other pruritic skin diseases
  - Positive allergy testing result (whether serology or skin test) is considered a minor criteria and is best used to support a clinically established diagnosis
Insect Bite hypersensitivity

Treatment
Treatment of IBH

Many treatments have been considered, from oral to topical options, to decrease inflammation. All these treatments have been typically only been evaluated in only one study thus no evidence-based conclusions can be made on their efficacy.
Essential oil extracts can have anti-inflammatory and repellent properties.

Improvement of skin lesions but not pruritus

No significant effect of cetirizine when compared to placebo

Use of insect control was the most useful approach

No significant effect on pruritus and lesions although most horse owners reported improvement
Consensus statement on treatment of IBH

Use of **insect repellents and other means for insect avoidance and glucocorticoids** largely remains the main approach for treatment of IBH in clinical practice

Large, **controlled studies are needed** to make evidence-based recommendations on treatment of IBH
Allergen – specific Immunotherapy
Specific immunotherapy in the treatment of *Culicoides* hypersensitive horses: A double-blind study

JOY L. BARBET, DIANE BEVIER, E. C. GREINER


N=10 horses; no control group
ASIT with laboratory cultured *C. variipennis* for 2 years
All but one horse showed improvement and 3 horses were free of signs after 2 years

Immunotherapy Trial for Horses in British Columbia with *Culicoides* (Diptera: Ceratopogonidae) Hypersensitivity

GAIL S. ANDERSON, PETER BELTON, ELISABETH JAHREN, HENRY LANGE, AND NICHOLAS KLEIDER

Department of Biological Sciences, Simon Fraser University, Burnaby, BC V5A 1S6 Canada

- in each group 4 owners thought that horses had improved

N=14; 6 months long, double blinded, placebo controlled;
No statist. significance between groups;

N=10 horses; no control group
ASIT with laboratory cultured *C. variipennis* for 2 years
All but one horse showed improvement and 3 horses were free of signs after 2 years
ASIT done using commercially available extracts
Clinical response was assessed every 4 months for one year
Insect repellent was used weekly in both groups

Both groups improved but no difference between ASIT group and placebo
Aspects in common among these studies

- **Used crude extracts (consisting of hundreds of proteins, possibly lacking salivary gland proteins)**
- No difference reported with placebo group
- Improvement of signs in both groups probably due to better insect control
ASIT for prevention
• 12 normal Icelandic horses were **vaccinated** three times with 4 **recombinant allergens**
• 6 by intralymphatic route and 6 intradermally
• IgG antibodies were produced which were able to partly block binding of serum IgE from one IBH affected horse
• No IgE were induced

**The ability of this vaccine to prevent clinical signs upon exposure has not been tested**
• Oral approach
  • Authors have attempted to induce a specific IgG response prior to exposure to Culicoides in the attempt to prevent disease
  • These antibodies were shown to partially block binding of some *Culicoides* allergen-specific IgE from IBH affected horses

• The ability of this strategy to prevent clinical signs upon exposure has not been tested
Consensus statement on ASIT for treatment in IBH

- Evidence is lacking to recommend ASIT for therapy of IBH using the commercially available extracts
- Studies are needed to explore benefits of ASIT using recombinant allergens
Consensus statement on prevention of IBH

Evidence is lacking on *clinically proven* preventative approaches for IBH
Current evidence for IL-31 in allergies and pruritus in horses
N=18 allergic horses were immunized with either eIL-31 covalently coupled to a virus-like particle or placebo.
Vaccine given at 0, 4 and 19 weeks
One booster the following year

Reduction of clinical scores compared to previous season and to placebo horses

No evaluation of pruritus in this study

Authors concluded that vaccination was safe and effective

Advantage to induce polyclonal immunity compared to the use of a monoclonal in the forms of a biologic
Recombinant equine IL-31 was produced and injected intradermally in 4 healthy horses using different doses and pruritus was monitored.
Other cytokines explored

• IL-5 as a promising target
  • Respiratory diseases
  • IBH
RESULTS
Eosinophil counts but not IgE levels correlate with disease severity

Vaccine was given SC on days 0, 28, 56, and 84
All horses received a booster on day 140
Follow up of previously published study
Horses boosted on following year showed more improvement than the previous year
Authors concluded that yearly vaccination could be a long term solution for treatment of IBH
Consensus statement

• Preliminary studies support
  • A role of IL-31 in mediating pruritus in horses making IL-31 a reasonable target for future therapies in allergic horses
  • A role for IL-5 in IBH and a beneficial effect of vaccines targeting this cytokine

• Larger studies are needed to evaluate strategies targeting these cytokines
Equine Atopic Dermatitis
Do horses have an equivalent of atopic dermatitis as we know it in people and dogs?

- Atopic dermatitis: a genetically inherited, relapsing, pruritic disease with characteristic clinical features most commonly associated with allergen specific IgE against environmental allergens....
Equine Atopic Dermatitis

Pathogenesis
Atopic disease, IgE and genetic predisposition in horses

• Multiple studies have demonstrated allergen specific IgE to environmental allergens by serology and skin test

• Multiple manifestations of atopic disease (Eg. Dermatitis and asthma) can be seen in the same horse although no specific report of atopic march has been published

• Clinically observed response to ASIT supports role of allergen specific IgE in both manifestations of atopic disease (dermatitis and asthma)

• Genetic predisposition is recognized but not well studied
  • offspring of dams suffering from summer eczema reported to have higher risk for disease
A significantly greater number of positive reactions for IDT in horses with atopic dermatitis and recurrent urticaria compared with horses without atopy, provides evidence of type-I IgE-mediated hypersensitivity for these diseases although positive reactions could be seen in normal horses.

Table 7—Percentage of positive reactions* during IDT in horses without atopy, horses with AD, and horses with RU

<table>
<thead>
<tr>
<th>Allergen</th>
<th>Group</th>
<th>% at 30 min</th>
<th>% at 6 h</th>
<th>% at 24 h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Time after injection of allergens</td>
<td>%</td>
<td>P</td>
<td>OR</td>
</tr>
<tr>
<td>Grass</td>
<td>Without Atopy</td>
<td>22.4</td>
<td>11.2</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>AD</td>
<td>39.0 &lt; 0.001</td>
<td>2.22</td>
<td>1.25-3.64</td>
</tr>
<tr>
<td></td>
<td>RU</td>
<td>41.3 &lt; 0.001</td>
<td>2.44</td>
<td>1.59-3.77</td>
</tr>
<tr>
<td>Weed</td>
<td>Without Atopy</td>
<td>32.2</td>
<td>26.6</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>AD</td>
<td>49.4 0.006</td>
<td>2.05</td>
<td>1.18-3.57</td>
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<tr>
<td></td>
<td>RU</td>
<td>56.4 0.001</td>
<td>2.72</td>
<td>1.67-4.44</td>
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<tr>
<td>Tree</td>
<td>Without Atopy</td>
<td>19.3</td>
<td>10.1</td>
<td>8.0</td>
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<tr>
<td></td>
<td>AD</td>
<td>37.5 0.001</td>
<td>2.51</td>
<td>1.53-4.10</td>
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<tr>
<td></td>
<td>RU</td>
<td>33.1 0.001</td>
<td>2.07</td>
<td>1.33-2.23</td>
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<td>Mold</td>
<td>Without Atopy</td>
<td>11.9</td>
<td>12.5</td>
<td>—</td>
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<td></td>
<td>AD</td>
<td>20.8 0.004</td>
<td>1.94</td>
<td>1.20-3.14</td>
</tr>
<tr>
<td></td>
<td>RU</td>
<td>16.3 0.102</td>
<td>1.43</td>
<td>0.91-2.25</td>
</tr>
<tr>
<td>Insect</td>
<td>Without Atopy</td>
<td>30.2</td>
<td>22.3</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>AD</td>
<td>71.4 0.001</td>
<td>3.88</td>
<td>1.63-8.40</td>
</tr>
<tr>
<td></td>
<td>RU</td>
<td>78.0 0.001</td>
<td>5.56</td>
<td>2.47-12.4</td>
</tr>
</tbody>
</table>

*Percentage of positive reactions = (No. of positive reactions for all horses/No. of possible positive reactions) × 100.

OR = Odds ratio; CI = 95% Confidence interval. — = Not applicable. ND = Not determined, because a value of 0 was included in the 2 × 2 table.
Intradermal testing in healthy horses and horses with chronic obstructive pulmonary disease, recurrent urticaria, or allergic dermatitis

Eduard Jose-Cunilleras, DVM, DACVIM; Catherine W. Kohn, VMD, DACVIM; Andrew Hillier, BVSc, DACVD; William J. A. Saville, DVM, PhD, DACVIM; Gwendolen Lorch, DVM, MS, DACVD

Results—Compared with healthy horses, horses with COPD, RU, and AD were significantly more likely to have positive (≥3+) reactions to intradermal allergens (molds, weeds, trees, grasses/crops, and insects) 30 minutes (immediate reaction), 4 hours (late-phase reactions), and 24 hours (delayed-phase reactions) after exposure. In addition, diseased horses reacted to a significantly higher number of allergens in each allergen group than did healthy horses.

Conclusions and Clinical Relevance—Reactions to individual allergens should not be used to determine that horses have hypersensitivity. Overall patterns of reactivity to intradermal allergens may be helpful in management when used in conjunction with a compatible history and evidence of potential exposure to allergens in horses with conditions associated with hypersensitivity to environmental allergens. (J Am Vet Med Assoc 2001;62:1115–1121)

P. Wilkolek, W. Sitkowski, M. Szczepanik, L. Adamek, M. Pluta, I. Taszkun, M. Gołyński, A. Malinowska

Comparison of serum concentrations of environmental allergen-specific IgE in atopic and healthy (nonatopic) horses

The mean IgE concentrations for most allergen groups were significantly higher in the atopic horses than in the healthy animals. However, a high incidence of positive reactions was observed in both healthy and allergic horses. Our results
Epidermal abnormalities in horses with “seasonal dermatitis”

- Only one study (two normal and two atopic horses)
- Descriptive showing EM abnormalities in atopic horses when compared to healthy controls
  - Similar aberrations to what has been reported in atopic dogs and people
The relevance of these alterations in the sensitization and elicitation process is unknown.

Disorganized lipid material in intercellular spaces of atopic horse.
Consensus statement

• A role for allergen specific IgE in equine “atopic dermatitis” is supported by serology and skin test studies and by a positive response to ASIT

• Anecdotal evidence exist about genetic predisposition and co-existence of respiratory and cutaneous manifestations of atopic disease in horses

• Studies on skin barrier and cytokine dysregulation are needed
  • Insufficient information exist about the role of skin barrier
  • No published studies on cell mediated response and cytokine expression in the skin of atopic horses could be found (all studies have been on IBH)
Equine Atopic Dermatitis

Clinical signs
Face, antebrachial area and inguinal area can be affected

Pics of case in which lesions persisted despite aggressive insect control
Completely responded to ASIT
Clinical signs

• Overlap between environmental allergies and insect allergies can lead to clinical manifestations which are a combination of those allergies
Consensus statement

Pruritus and dermatitis on the face and flexural surfaces can be associated with seasonal environmental allergies.

Co-existence of pollen and insect allergies is common in warm climates and this leads to a combination of clinical signs with IBH.
Atopic dermatitis

Diagnosis
Diagnosis of equine atopic dermatitis

• Diagnosis should be **clinical** and based on history, clinical signs, and exclusion of other pruritic diseases
  
  • The role of insect bites should be ruled by aggressive insect control
  
  • Positive **allergy testing is a minor criteria** for diagnosis as normal individuals may have positive results
• Reproducibility of intradermal test between right and left side has been evaluated in one study as well as correlation with serology showing agreement only for a few allergens...
Comparison of immediate intradermal test reactivity with serum IgE quantitation by use of a radioallergosorbent test and two ELISA in horses with and without atopy

Gwendolen Lorch, dvm, ms; Andrew Hillier, bvsc, dacvd; Kenneth W. Kwochka, dvm, dacvd; William J. Saville, dvm, phd, dacvim; Catherine W. Kohn, vmd, dacvim; Bruce E. LeRoy, dvm, dacvp

Results—An ELISA based on the α chain of the high-affinity IgE receptor, the Fcɛ receptor immunoglobulin ε chain (FcɛRα) for IgE, had the overall highest kappa statistic (0.238), positive predictive value (49%), and negative predictive value (78%). Overall agreement between the FcɛRα-based ELISA and the intradermal test was fair. The highest kappa statistic was obtained by the FcɛRα-based ELISA in horses with atopic dermatitis (0.330). Kappa statistics for the radioallergosorbent test and a polyclonal antibody-based ELISA agreed slightly with that of the intradermal test at best.

Conclusions and Clinical Relevance—None of the 3 serum allergy tests reliably detected allergen hypersensitivity, compared with the intradermal test. The FcɛRα-based ELISA performed significantly better overall than the other 2 tests. Low sensitivity of all 3 assays indicates the need for continued study to elucidate a more sensitive test for the determination of potentially pathogenic allergens in horses. (J Am Vet Med Assoc 2001;218:1314–1322)

Earlier studies reported poor correlation between serology and skin test

More recent studies reported very good correlation
Excellent positive correlations between allergen specific IgE at the beginning of the study and immediate reaction on IDT (P < 0.00001)
IgE against cross-reactive carbohydrate determinants (CCD) in horses

• Abstract at the 2020 World Congress of Vet Dermatol
  • Enck et al. Detection and inhibition of IgE antibodies reactive with cross-reactive carbohydrate determinants in an ELISA for allergen-specific IgE in horses. Vet Dermatol 2002 31 (suppl 1): 23

• Sera from 28 horses clinically diagnosed with allergies
  • Inhibition of IgE against CCD substantially decreased positive results for pollen allergens while had no effect on mite reactivity

• Authors concluded that inhibition of CCD reactivity will increase accuracy of serology testing in horses
Consensus statement on diagnosis of equine atopic dermatitis

• Diagnosis is clinical, based on history, clinical signs and exclusion of other pruritic diseases

• Positive results on an allergy testing should be considered a minor criteria
Atopic dermatitis

Treatment
Treatment

• No published guidelines for the treatment of equine atopic dermatitis currently exist

• Control of flare factors is considered important (eg. Insect exposure and secondary infections)

• Oral and topical glucocorticoids are used in clinical practice to provide symptomatic relief
  • No controlled studies have been done on the use of glucocorticoids or antihistamines in atopic horses (although benefit has been reported in retrospective studies)

• ASIT has been used with good response in several studies
ASIT

- Studies are uncontrolled and retrospective yet support a beneficial effect
- Reduction of allergen specific IgE, increase of IgG has been reported in one study
- No changes in cytokine profile and T regs have been reported in another study
ASIT improvement

• Reported in 56% to 93% of horses depending on study
  • In one 2 year long study, improvement of signs was seen in 76.5% of horses one year and 82% after 2 years
  • In one study (Stepnik et al)
    • 93% of owner reported use of antipruritic medication prior to ASIT and
    • 59% were able to manage disease with ASIT alone
    • 27% stopped ASIT due to complete resolution of signs (average time for discontinuation of ASIT was 2 years)
  • No significant difference in efficacy whether ASIT was based on serology or skin test
Consensus statement on ASIT

- **Prospective, controlled studies** on treatment options for atopic horses are **lacking** and are **urgently needed**

- **Allergen-specific immunotherapy** via subcutaneous route has been **reported to be beneficial** in horses diagnosed with atopic dermatitis
- Insufficient information exists regarding the best protocol to use and on immunological changes in the course of ASIT in horses
Food allergy
Food allergy in horses

• Understanding food allergy in horses is considered an unmet need
• The role of foods as a flare factors in equine atopic dermatitis is not known
• Foods as a trigger of urticaria have been reported
Diagnosis

• Food trial is considered the best method to assess the role of foods as a trigger

• Serology testing for foods has been reported to be unreliable
  • positive results in normal horses are inconsistent and do not correlate with response on clinical challenge
Consensus statement

Understanding of food allergy in horses is largely missing
Foods have been described as trigger of urticaria
Take home points

• **There is very little evidence-based information on equine allergic skin diseases**

• Much of our knowledge on equine allergic skin disease is on IBH

• The role of IgE has been documented in both IBH and atopic dermatitis

• Very little is known about the pathogenesis of equine atopic dermatitis and the role of foods as triggers for AD is unknown

• Prospective studies on therapeutic options for atopic and IBH horses are needed
  • While some evidence exist on the beneficial effect of ASIT for atopic dermatitis, no evidence exists to support ASIT for IBH using currently available commercial extracts
  • Studies using recombinant allergens as treatment for IBH are needed
  • Exciting opportunities exist for cytokine based vaccines or biologics in horses in the future
Thank you for listening and for providing your feedback