Kansas State Veterinary
DIAGNOSTIC LABORATORY

DIAGNOSTIC *INSIGHTS*

MAY 2018

KSVDL Welcomes Dr. Sara Gonzalez as a New Team Member!

Born and raised in sunny South Florida, Sara attended the University of Florida for her education. She obtained her Bachelor of Science in Animal Biology in 2005, her Master of Science in Animal Science in 2007, and her Doctor of Veterinary Medicine in 2011.

Dr. Sara Gonzalez

While in school, her special interests included Small Animal Internal Medicine and Clinical Pathology. Sara's husband accepted a faculty position in the KSU Department of Animal Sciences and Industry when she completed her veterinary education, and the couple moved to Manhattan in June of 2011.

Sara gained experience as a small animal general practitioner at two local small animal practices before she joined the team at Kansas State University in August of 2016. As a Small Animal Emergency Clinician in the Veterinary Health Center, Sara was able to explore her interests in teaching and Internal Medicine.

In March of 2018, Sara accepted the position of Clinical Veterinarian in the Veterinary Diagnostic Laboratory at Kansas State University. In this role, she will focus on applying her companion animal experience to assist you in the submission process. This will include assistance in appropriate test selection through diagnostic test interpretation.

Additionally, she will teach an Applied Animal Behavior elective to second and third year veterinary students in the fall, and assist with the General Pathology rotation for the fourth year students.

When Sara isn't celebrating her new allegiance to the Wildcats, she enjoys spending time with her two children outdoors, traveling, cooking, reading, and practicing yoga.

Equine Leukoencephalomalacia (ELEM)

By Drs. Giselle Cino, Mike Moore, Jonathon Sago and Jeffrey Laifer

Equine Leukoencephalomalacia is caused by the ingestion of moldy corn. The cerebral changes are caused by fumonisin compounds produced by *Fusarium* spp., a fungus that grows on corn grains. There are several different fumonisin compounds, however B1 is most commonly associated with ELEM.

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Accredited by the American Association of Veterinary Laboratory Diagnosticians

TO SET UP AN ACCOUNT GO TO:
www.ksvdl.org/accounting-and-billing/

Equine Leukoencephalomalacia (ELEM) *(continued from page 1)*

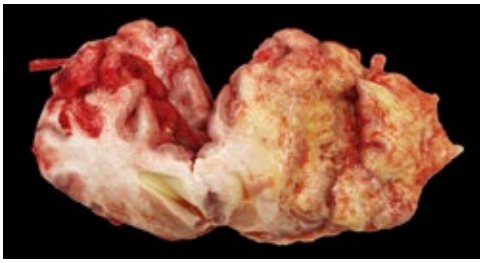

Figure 1: Cross-section of cerebrum at the level of the rostral aspect of the lateral ventricles. Significant white matter softening with minimal gray matter involvement is present on the right side.

Microscopic Lesions:

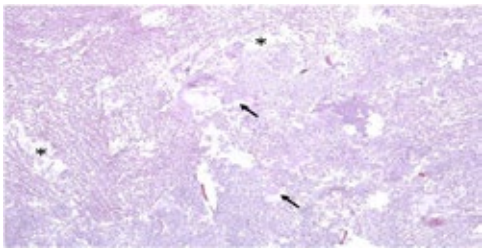

Figure 2: Right cerebrum – White matter necrosis with some edema (asterisks). Eosinophilic proteinaceous debris is present (arrows). Mild areas of hemorrhage are also present.

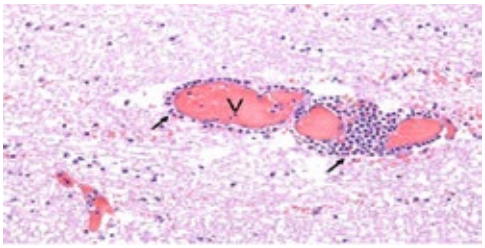

Figure 3: Perivascular cuffing is present with gitter cells (macrophages), lymphocytes, and plasma cells (arrows). Congestion of the vessel (V) is present with mild perivascular hemorrhage.

Clinical History and Physical Examination Findings

An adult Appaloosa gelding was presented for gross necropsy. The night before, this horse had become ataxic, and was found dead the next morning. This horse was in a herd being fed grass hay and whole corn which was reported by the owner to be "slightly" moldy. At the request of their veterinarian, the owners had stopped feeding the moldy corn 3 weeks previous because another horse had presented with ataxia and blindness. Unfortunately, they began feeding the corn again, one week previous to the case reported here.

Gross Lesions

On necropsy, the only tissue affected was the brain. There was right-sided cerebral edema, yellow gelatinous malacia and liquefaction within the frontal, parietal, and temporal lobes. The areas of malacia spared the gray matter. Mild hemorrhage was present within the necrotic white matter. (Figure 1)

Microscopic Lesions

See Figures 2 and 3 (left column).

Laboratory Results

Rabies testing was negative.

Take Home Message

Equine Leukoencephalomalacia caused by ingestion of fumonisin can lead to severe neurological signs and death of multiple horses. Toxicity level and lesion severity depend on dose and length of time that horses are exposed to the affected feed; they are typically present 1-2 days after exposure. However, clinical signs may take weeks to develop occasionally. Clinical neurologic signs will depend on the severity of lesions and the anatomic locations most heavily affected. As there is no treatment for this condition, prevention measures are important and dependent on not feeding molding corn to horses.

References

1. Foreman, J.H., Constable, P.D., Waggoner, A. L., Levy, M., Eppley, R., Smith, G. W., Tumbleson, M.E. and Haschek, W.M. (2004). Neurologic abnormalities and Cerebrospinal Fluid Changes in Horses Administered Fumonisin B1 Intravenously. Journal of Veterinary Internal Medicine, 18: 223-230. Doi: 10.1111/j.1939-1676.2004.tb00165.x

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3. McGavin, M.D. et al, Pathologic Basis of Veterinary Disease, (2012), pg. 843-844.

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Canine Solar Dermatitis

By Drs. Charan Ganta and Sarah Schneider

What is solar dermatitis?

Canine solar dermatitis or chronic sun burn is a severe dermatologic disorder that often occurs on the medial aspect of the legs, ventrolateral abdomen and thorax, lateral flank, and bridge of nose in non-pigmented skin. The distribution of the lesion is dependent on the individual animal behavior and length of exposure. The lesions usually start as erythema and scaling which will evolve into thick, firm and wrinkled skin, with alopecia, comedones (dilated hair follicles) with occasional round raised red nodular masses (Figure 1). The haircoat, stratum corneum, and melanin pigmentation usually protect against the harmful effects of UV radiation. However certain breeds with short hair coat and or light pigmention like Beagles, Boxers, Bull Terriers, Dalmatians, Pit bulls, Whippets etc. are more frequently affected. Figure 1B & C shows a 5-year-old boxer with black spots demonstrating sharp demarcation between areas of normal skin with dark pigment and damaged unpigmented skin showing marked epidermal hyperplasia and erythema, suggestive of the protective effects of melanin pigmentation.

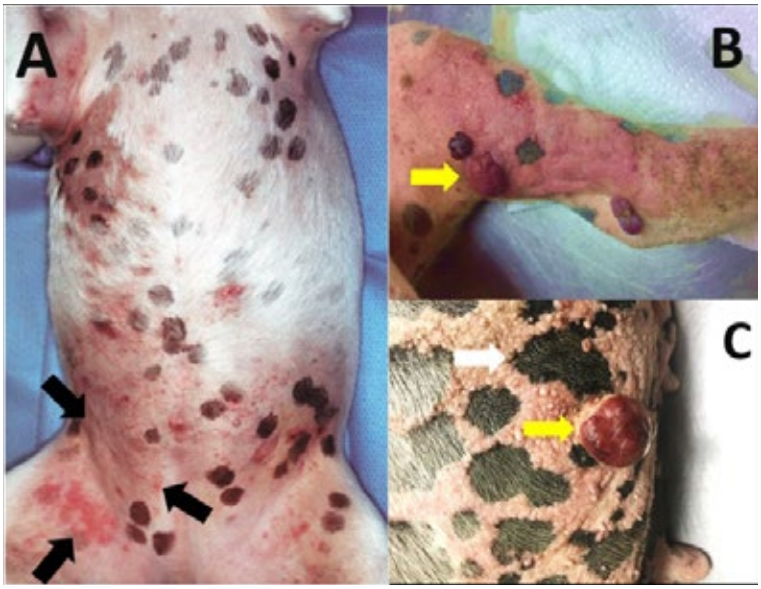

Figure 1: Dermal lesions noticed mostly on the ventrum nclude erythema, crusting (black arrows) and nodules identified as hemagiosarcoma (yellow arrows). A sharp demarcation in epidermal changes noticed in pigmented and nonpigmented areas (white arrow). Image courtesy: Dr. Ann Hargis, De Soto (Kansas) Veterinary Clinic.

Pathogenesis

Long term direct exposure to high energy ultraviolet radiation, UVA (320-400 nm) and UVB range (290-320 nm) leads to phototoxicity. The three important cellular events include 1. Oxidative damage and cell death; 2. Immune suppression; 3. Inhibition of tumor suppression. High energy UV radiation causes direct damage to keratinocytes via free radical damage and release of proinflammatory cytokines that enhance tissue injury and cell death along with weakened immune system leading to secondary infections. Intermittent chronic

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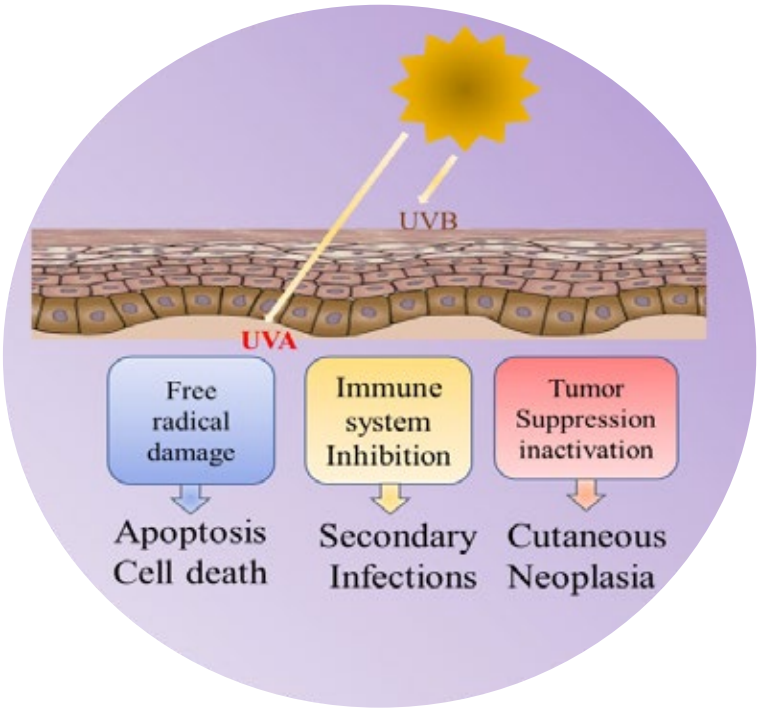

CANINE SOLAR DERMATITIS *(continued from page 3)*

exposure causes keratinocyte proliferation, mutagenesis, and premalignant actinic keratosis which can evolve into sun-induced skin tumors like squamous cell carcinoma, hemangioma, and cutaneous hemangiosarcoma.

Clinical Diagnosis

The skin lesion initially manifests as erythema and scaling which often resemble pyoderma, dermatophyte infection, cutaneous lymphoma or an autoimmune disease. Hence an adequate history (including history of sun bathing/ sun exposure), patient signalment, duration, distribution and location of the lesions and non-responsiveness to standard of care therapy are often helpful in ruling out solar dermatitis.

Biopsy Collection and Histopathology

A definitive diagnosis can only be reached by histopathological examination of the skin biopsy. We recommend collection of multiple skin biopsies at different stages of the disease. Based on the presentation of the gross lesions, often the samples should include areas of erythema, crusted plaques, nodules, and margins of ulcers to see the full spectrum of the disease. Solitary nodules should be completely excised to prevent overt progression of neoplasia. In the event of secondary pyoderma, biopsies should be collected post antibiotic therapy to prevent misdiagnosis.

The most consistent histologic finding in dogs with chronic solar dermatitis is a narrow, hypocellular, pale-staining band of collagen along the dermo-epidermal junction with deposition of numerous pale blue stained elastin fibers (Figure 2B). Epidermal hyperplasia, follicular dilation with keratosis (comedones) and dermal fibrosis is often noticed. In chronically exposed severe cases, concurrent UV light–induced neoplasms, such as hemangioma, hemangio-sarcoma (Figure 2D), or squamous cell carcinoma could be noticed.

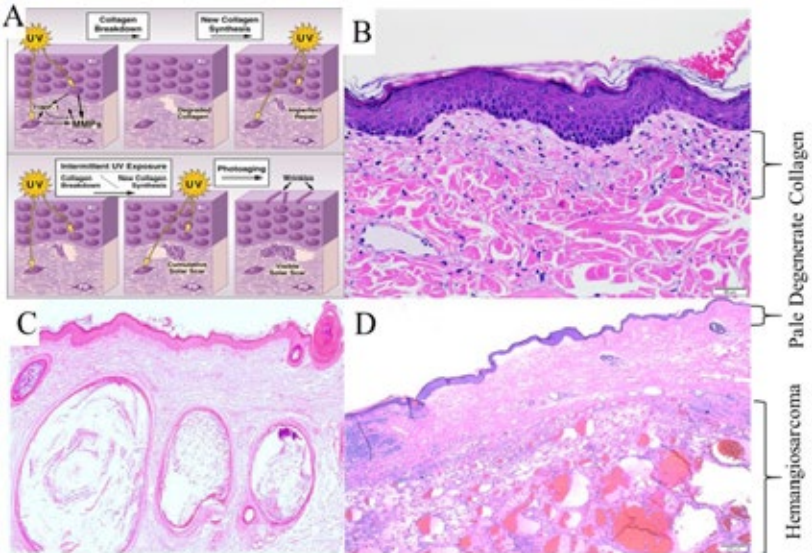

Figure 2: UV radiation causes collagen degeneration and, with repeat exposure, there is accumulation of pale degenerate collagen as a lichenoid band in the superficial dermis (A). H&E image showing lichenoid pale band of collagen in superficial dermis (B); H&E image showing multiple dilated hair follices (C); H&E image showing a section of the dark nodular mass consistent with hemangiosarcoma (D). MMPs: Matrix metalloproteinases; TIMPs: Tissue inhibitors of metalloproteinases: FB Fibroblast; KC: Keratinocyte. Image courtesy: Drs. Brad Njaa and Ann Hargis

Treatment

The best treatment option is to minimize the exposure to sunlight. Additional treatment options are available. Due to the scope of this newsletter, they are not listed here, we recommend contacting the KSU-CVM Veterinary Health Center at 785-532-5690 for treatment and management options.

Questions or comments: ckganta@vet.k-state.edu

References

(Provided on request)

New Tool for Bovine Practitioners!

Bovine Diet Sulfur Calculator

To use this tool, please follow the link (pictured in the green circle) located at www.ksvdl.org

For more information contact KSVDL Client Care at 866-512-5650 or clientcare@vet.k-state.edu.

Register Now For The 80th Annual Conference For Veterinarians!!

Speakers and schedules will be posted on the following website soon.

http://www.vet.k-state.edu/education/continuing/conferences/annual-conf18/index.html

New Videos at KSVDL YouTube Channel

Polioencephalomalacia (PEM) in Cattle
https://www.youtube.com/watch?v=RCAxV9E1ju0&list=PLNjV05pK4JEVLnizQ_jEiqLN1eYdpJtdq

Heat Treatment for Heartworm Testing
https://www.youtube.com/watch?v=DP007ESvFy4&list=PLNjV05pK4JEUCABbmIQhKyJzuwk3HbFwF&index=21

Staining Cytology Samples for Evaluation Prior to Submission
https://www.youtube.com/watch?v=zm-Fmqf4CvI&list=PLNjV05pK4JEVLl3x8_mLYXxpjfMV-Gq4P&index=2

To view all the available videos on our channel, please follow this link:
https://www.youtube.com/channel/UCtx-lIIXqj5PAMQYryXaRhA

KSVDL Personnel Activities

Activities

Dr. Cindy Bell conducted a poultry necropsy wet-lab for the KSU-CVM Student Chapter of the American College of Veterinary Pathologists in Manhattan, KS.
Dr. Brian Lubbers will present "Antibiotic Stewardship in Food Animal Medicine" at the Presidential Advisory Council on Combating Antibiotic-Resistant Bacteria in Washington, DC.
Drs. Cindy Bell and Manuel Chamorro (CVM-VHC) talked to fourth grade students about food producing animals at the Lyon County Farm Bureau, "Day at the Farm" in Emporia, KS.
Dr. Gregg Hanzlicek presented: An update on Anaplasmosis in Southeast Kansas. KSU Agriculture Field Day. Parsons, KS.
Dr. Gregg Hanzlicek wrote an article for the Kansas State Research and Extension Newsletter, *Beef Tips* titled: *What Did We Learn From the Kansas State-Wide Anaplasmosis Prevalence Study?*
Dr. Gregg Hanzlicek wrote two articles for Drovers Journal titled: *Anaplasmosis: A review: Part I and II*.

Publications

Jianfa Bai, Valentina Trinetta, Xiaorong Shi, **Lance W Noll**, Gabriela B Magossi, **Wanglong Zheng**, **Elizabeth P Porter**, Natalia Cernicchiaro, David G Renter, Tiruvoor G Nagaraja. *A multiplex real-time PCR assay, based on invA and pagC genes, for the detection and quantification of Salmonella from cattle lymph nodes.* J Microbiol Methods. 2018. 148, 110-116. doi.org/10.1016/j.mimet.2018.03.019.
Scott L Radke, Chris W Olsen, **Steve M Ensley**. *Elemental impurities in injectable iron products for swine*. 2018. https://www.aasv.org/shap/issues/v26n3/v26n3p142.html
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Lalitha Peddireddi, Kelly A. Foster, **Elizabeth G. Poulsen**, Baoyan An, Quoc Hung Hoang, Catherine O'Connell, **Joseph W. Anderson**, Daniel U. Thomson, **Gregg A. Hanzlicek**, **Jianfa Bai**, **Richard A. Hesse**, Richard D. Oberst, Gary A. Anderson, Ivan Leyva-Baca. *Molecular detection and characterization of transient bovine viral diarrhea virus (BVDV) infections in cattle commingled with ten BVDV persistently infected cattle*. Journal of Veterinary Diagnostic Investigations. 2018 May;30(7).
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Jianfa Bai, Valentina Trinetta, Xiaorong Shi, **Lance W Noll**, Gabriela Magossi, **Wanglong Zheng**, **Elizabeth P Porter**, Natalia Cernicchiaro, David G Renter, Tiruvoor G Nagaraja. *Comparison data of a two-target real-time PCR assay with and without an internal control in detecting Salmonella enterica from cattle lymph nodes*. Data in Brief. 2018. doi.org/10.1016/j.dib.2018.04.051.

Field Investigations

Udder health assessment in a Kansas dairy. Junction City, KS
Chronic diarrhea in adult cows on a Kansas ranch. Soldier, KS
Chronic lameness in dairy heifers. Cimarron, KS Chronic lameness in dairy heifers. Cimarron, KS
Sudden death loss in cows and calves on a Kansas ranch. Sun City, KS

Developing and Delivering Accurate, Innovative Diagnostic Services

The mission of the Kansas State Veterinary Diagnostic Laboratory (KSVDL) is to develop and deliver accurate, innovative, and timely diagnostic and consultative services to the veterinary and animal health community while providing support for teaching, training and research programs.

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Continuing Education

www.vet.k-state.edu/education/continuing/

June 3-5, 2018
80th Annual Conference for Veterinarians
Manhattan, Kansas
http://www.vet.k-state.edu/education/continuing/conferences/annual-conf18/index.html

June 11-13, 2018
Diagnostics of Endemic & Emerging Diseases: Beyond the Status Quo
Manhattan, Kansas
www.vet.k-state.edu/education/continuing/conferences/CEEZAD-KSVDL-Conf/index.html

July 13-17, 2018
AVMA Convention
Denver, Colorado
https://www.avma.org/Events/Convention/Pages/default.aspx

For more information, call the Continuing Education Office at 785-532-4528.

Test Results and Schedules

Laboratory results available online, all the time!

Holiday Schedule

Memorial Day: Closed Monday, May 28th
Open Saturday, May 26th , normal business hours (8 a.m. to 12 noon)
Open Tuesday, May 29th, normal business hours

4th of July: Closed Wednesday, July 4th
Open Tuesday, July 3rd, normal business hours
Open Thursday, July 5th, normal business hours

To receive this newsletter by email, contact: ksvdloutreach@vet.k-state.edu.

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