Fall 2022

AVHTM Newsletter

A 501(c)(3) nonprofit professional association

Volume 6, Issue 3

Special Events of Interest:

- **ACVECC VetCOT Veterinary Trauma & Critical Care Symposium**
  March 24-26 2023
  Las Vegas NV

  The conference will be held in conjunction with the Trauma, Critical Care & Acute Care Surgery Conference
  (March 27-29 2023)
- **VECCS Spring Symposium**
  March 23-28 2022
  Port Douglas, Australia
- **ECVECC**
  June 1-3 2023
  Porto, Portugal
- **ACVIM**
  June 15-17 2023
  Philadelphia PA
  (AVHTM Track and SIG on June 16th)

Welcome to the Summer AVHTM Newsletter

Welcome to the autumn AVHTM Newsletter. We have great summaries of the 2022 ACVIM and IVECCS AVHTM streams for those who could not attend. Looking forward, we have a preview of the upcoming conference VetCOT Veterinary Trauma & Critical Care Symposium. Prof Eva Spada and Prof Daniela Proverbio shared an interesting article describing their work on the link between blood types and susceptibility to disease. Prof. Dr. Umer Farooq and Dr. Musadiq Idris were kind enough to provide us with a glimpse of their research on various large animal species, including camels! We also have our usual list of all the latest literature in hematology and transfusion medicine. We hope you enjoy the read!

Recap from the AVHTM Lectures at the ACVIM Forum 2022

Associate Professor Claire Sharp

The AVHTM facilitated four lectures at this year's ACVIM forum in Austin, TX. Dr. Stephan Moll, MD, from the University of North Carolina, School of Medicine, got the live sessions started (albeit presenting virtually due to flight cancelations) with a lecture on the diagnosis and treatment of venous thromboembolism in humans. He presented great cases to take us through the decision-making approach used in human medicine. This relies on differentiation of thrombi in deep vs. superficial veins, proximal vs. distal veins, assessment of the clinical consequences of thrombosis, the use of Doppler ultrasound to characterise acute vs. chronic thrombi, and a good understanding of the individual patient's transient and permanent risk factors for thrombosis. He also covered a lot of ground regarding the choice of direct oral anticoagulants, describing his clinical experience (and some trial data) demonstrating a lower risk of major bleeding and potential slight benefit with regard to recurrent VTE of abixaban vs. rivaroxaban. AVHTM member Marilyn Dunn, DVM, MVSc, DACVIM (SAIM) (University of Montreal), also presented an On Demand lecture on the "Diagnosis and Management of Venous Thromboemboli" from the veterinary perspective, reviewing the same decision make processes in our dog and cat patients.

Two complementary lectures also addressed an outbreak of pancytopenia in cats in the United Kingdom (UK). Drs. Karen Humm, MA, VetMB, MSc, DACVECC, DECVECC, FHEA, MRCVS, and Barbara Glanemann, Dr. vet.med., DECVIM-CA,

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Recap from the AVHTM Lectures at the ACVIM Forum 2022

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FHEA, MRCVS, from the Royal Veterinary College (RVC), presented their personal journey on the front lines of investigating the origins of this outbreak and treating cats with this devastating condition. The first cases were seen in late April / early May 2021, including two siblings from the same household that presented with pancytopenia secondary to bone marrow aplasia. Affected cats had severe anaemia requiring transfusion, thrombocytopenia resulting in mucosal bleeding, and in many cases febrile neutropenia. By September 2021 more than 500 cats (with a mortality rate > 60%) had been identified with pancytopenia at the RVC, or by veterinarians who reported the cases via a surveillance system that the presenters established. Ultimately the authors dedication and collaborations led to the discovery of likely pet food contamination with trichothecene mycotoxins that accounted for the outbreak, and a massive petfood recall across the UK ensued. Watching their presentation was extremely emotional given the devastating toll of this outbreak, but also an honour to see how the expertise and tenacity of our colleagues helped minimise the deleterious consequences of this outbreak.

I then had the pleasure of describing the discovery of a novel virus causing severe fever and thrombocytopenia in cats in Japan. Although I have no personal experience with the virus, or cats infected by it, as a virology nerd I've had the opportunity to follow the story of its discovery and expanding understanding of its epidemiology. Some of the AVHTM membership became interested in this virus via Listserv discussions in the early stages of the aforementioned UK pancytopenia outbreak, and although it quickly became apparent that it was not the culprit of the outbreak, the emergence of such haemorrhagic viruses in veterinary species was worthy of consideration. Severe fever with thrombocytopenia syndrome virus (SFTSV) was first discovered in humans in China in 2011, in some domestic animals in 2013, and in big cats in 2018. It has since been reported in domestic cats in Japan, causing thrombocytopenia, leukopenia, and fever, with >60% mortality. Of additional concern, cat to human transmission has been reported, including to veterinarians caring for affected cats. So a good reminder of the constant threat posed by emerging viruses (in case we needed another one in the post-COVID world).

Thank you to Entegrion for sponsoring the AVHTM dinner, and to Drs. John Thomason, Liz Rozanski, and Ian DeStefano for their presentations on Vexing Viscoelastograms and Tricky Tranexamic Tribulations. It was a great night with lively conversation and time to connect with colleagues.

Thank you also to the AVHTM Board of Directors for putting together another amazing AVHTM program. Looking forward to more stimulating content and networking opportunities in 2023.

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AVHTM Events at IVECCS 2022

Associate Professor John Thomason

The AVHTM had several well-received sessions at the International Veterinary Emergency and Critical Care Symposium (IVECCS) 2022 in San Antonio, Texas. Drs. Tom Edwards and Andrew Cap gave an interesting four-hour lecture series about "Lessons Learned from the Battlefield" and "War Dogs – Case Reports on our 4-Legged Heroes". These sessions presented unique perspectives on transfusion medicine in critical settings and provided insights into how military experiences can influence veterinary emergencies and critical care. There were two excellent presentations on transfusion medicine. Drs. Erin Mays presented on "Plasma and Albumin Transfusion" and Sarah Musulin discussed "Crossmatching – Ins, Outs & Controversies." Dr. Rebecca Walton gave an outstanding lecture on the "Approach to the Anemic Cat" and Dr. John Thomason provided the latest information on "Anti-Platelet Therapy: What is Safe & Effective." Finally, Dr. Erin Mays finished the stream with a talk on "The Future of Transfusion Medicine". Thank you to Animal Blood Resources International (ABRI) for sponsoring this track of AVHTM lectures. We look forward to seeing everyone at IVECCS 2023 at the Gaylord Rockies in Denver, Colorado.

Dear Colleagues:

We are excited to invite you to the annual ACVECC VetCOT Veterinary Trauma & Critical Care Symposium March 24-26, 2023, in Las Vegas, NV. The conference will be held in conjunction with the Trauma, Critical Care & Acute Care Surgery Conference (March 27-29, 2023). This conference is a unique opportunity for those with an interest in trauma medicine and surgery to share ideas, experiences, and expertise in a smaller forum conducive to discussion and collaboration. While the target audience is veterinary specialists (DACVECC, DACVS, DACVAA), we strongly encourage residents (ACVECC, ACVS, ACVAA), Emergency clinicians, ECC technicians, and allied specialists and residents (ACVO, ACVIM-neurology, ACVSMR, ACVR) to attend. Although the focus is small animal trauma, our large animal colleagues are also encouraged to attend. Accepted oral abstracts are published annually in JVECC (please contact Kelly Hall for details regarding how to submit). This year, there are travel grants available for top submissions.

Tentative schedule:

Friday afternoon, March 24, 1:00-5:30 PM: VetCOT subcommittees meetings– all are welcome to attend! A Zoom link to attend remotely will also be provided.

Saturday March 25, 9:00 AM-5:30 PM: Conference officially begins. Trauma abstracts and Case reports, DACVECC panel case discussion, MD trauma surgeon presentation, and more. *New this year: Evening poster session and mixer*

Sunday March 27, 8:30 – 5:30 PM: Year in Review, Performance Improvement and Patient Safety program vignettes, overlapping sessions with Trauma-Critical Care conference, DVM/VMD and MD joint presentations with panel to follow, and more!

1. Hotel registration for the VetCOT Conference can be made through the hotel booking on the Trauma, Critical Care & Acute Care Surgery website
2. Registration fee: $300 DVMs, $150 technicians/residents. Online registration will be available by November 1, 2022 on the VetCOT website.
3. Registration for the human Trauma, Critical Care & Acute Care Surgery conference is separate, and can be made on the link, above.

If you have any questions, please contact Kelly Hall (khall.wilke@colostate.edu).

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Join us for our Annual SIG at the ACVIM Forum 2023

June 16 2023, 6:00 pm

Maggiano's Little Italy

1201 Filbert St

Philadelphia Pennsylvania

SAVE THE DATE!

RSVP will open soon at avhtm.org

Association between AB blood group system blood types and infectious diseases in cats

Prof. Dr. Eva Spada and Daniela Proverbio

There is growing evidence that blood groups affect host susceptibility to some infections in man. There are many reasons for this association – the first is that some blood group antigens act as receptors for pathogens. A classic example of this is that Duffy blood group antigenic determinants on the erythrocyte surface are required for invasion of erythrocytes by Plasmodium vivax merozoites, one of the aetiological agents of malaria. There is a complete absence of the molecule carrying the Duffy blood group antigens on erythrocytes in almost all people of West African heritage, and this absence provides protection from P. vivax in these individuals.1

Little is known about blood group-associated infectious disease risks in cats. However, recent studies have looked at the association between some feline infectious diseases and feline phenotypes and genotypes of AB blood group system.

Knowing that type-A blood antigens, but not type-B antigens are expressed on feline lymphocytes2, and that the latter are target cells for pathogenic activity of feline retroviruses FIV and FeLV, a multicenter, multicountry (Italy, USA and Australia) study explored whether there was a relationship between blood types of AB blood group system and retroviral infections in cats. No relationship was identified between feline retroviral status and either feline blood phenotypes or blood genotypes in this study.3

A second study was an observational study evaluating the association between feline haemoplasma infection status and blood genotype in cats from the UK or blood phenotype in cats from Italy, under the hypothesis that blood type antigens present on feline erythrocytes could serve as attachment sites for these haemopathogens. In this study a significantly higher number of Ab genotype cats tested positive for haemoplasma (p=0.04) and for Mycoplasma haemofelis infection (p=0.03). Further investigations in a larger number of haemoplasma-infected cats of known blood phenotype are warranted to explain the association between genotype Ab and haemoplasma infection. 4

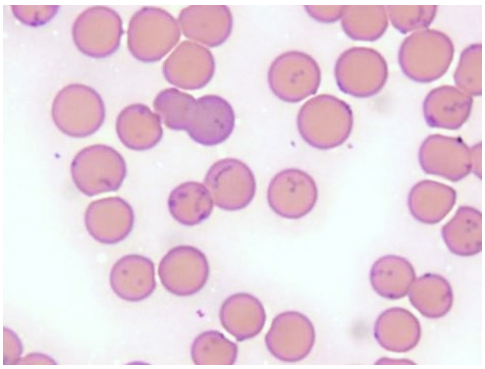

Photo courtesy of Dr. Austin Viall

A second mechanism through which susceptibility to infections has been associated with the ABO blood group in people is through the activity of naturally occurring antibodies. ABO naturally occurring antibodies can decrease the transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection in man.5 SARS-CoV-2 infectious viral particles are mainly synthesized in epithelial cells of the upper respiratory tract and these cells might express the ABO antigens. This led to the hypothesis that, when sufficient levels of anti-A and/or anti-B isohaemagglutinin antibody titers are present, they might offer some degree of protection to individuals with O, A, and B blood types against the transmission of SARS-CoV-2, because these antibodies have a neutralizing activity against SARS-CoV-2, with O type individuals having significantly lower risk of infection. Blood type AB individuals lack both anti-A and anti-B antibodies; therefore, they would completely lack the protective effect given by these antibodies. 5 Based on this premise, we undertook a study on the possible role of feline AB blood group system phenotypes in feline coronavirus (FCoV) and SARS-CoV-2 infection in cats. Serostatus for FCoV does not seem to be influenced by blood phenotypes A, B and AB in an Italian feline population6, while seropositivity for SARS-CoV-2 infection seem to be significantly greater in AB-type cats (paper under review).

Based on the results of these preliminary studies, the relationship between blood type and infectious disease status requires further study in veterinary patients, keeping in mind that simultaneously we need more and additional studies on the presence and characteristics of new feline and canine blood types.

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2. Symons R, Bell K. The occurence of the feline A blood group antigen on lymphocytes. Anim Blood Groups Biochem Genet. 1985;16:77-84.
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Pen-side Hematological Formulae for Estimating Hemoglobin from the Packed Cell Volume in Livestock

Prof. Dr. Umer Farooq and Dr. Musadiq Idris
Department of Physiology, The Islamia University of Bahawalpur-PAKISTAN

Laboratory diagnosis of anemia is based on the hemoglobin (Hb) concentration, the number of RBCs and the hematocrit/packed cell volume (PCV) values. At the moment, it is a common practice that the anemia and its types are diagnosed too late in livestock. This leads to emaciation and deteriorated generalized health status of animal leading to decreased productivity. Furthermore, the blood profiling techniques available to rural livestock farmers are only through hematology analyzers intended for humans (due to unavailability of veterinary hematology analyzers in the area) which may give erroneous results. A thumb rule has been adapted in human medical laboratory practice in estimating Hb concentration as 1/3rd of PCV or vice versa (Hb=PCV/3). However, there is hardly any information on the validity of this commonly used relationship between Hb concentration and PCV, and other relationships/mathematical formulae between various hematological attributes for veterinary medical practice.

The Department of Physiology at The Islamia University of Bahawalpur- PAKISTAN has recently won a research grant by the Pakistan Science Foundation ($15,000USD) to examine such formulae. Accordingly, the laboratory of the department is actively engaged in research work for this aspect of hematology on blood of various livestock (cattle, sheep, goats and camels) being reared under pastoralism in the Cholistan Desert of Pakistan. Results have been published in various peer-reviewed journals listed at the end.

We have concluded that instead of applying the human hematological formula of Hb= 1/3rd of PCV, following hematological formulae may be adopted for estimating Hb from PCV:

a)	For Zebu (humped) cattle:	0.13(PCV) + 6.3	(Ahmad et al. 2022a)
b)	For Goats:	0.24 (PCV) + 1.5	(Ahmad et al. 2022b)
c)	For One-humped Camels	0.18(PCV) + 5.4	(Ahmad et al. 2022c)

We are still working on blood of other desert livestock species and breeds for devising such pen-side hematological formulae. Deducing Hb from PCV in this manner and through these formulae will help diagnosis anemia in livestock at an early stage, with ease, and less tedious laboratory technology.

We appreciate any positive input towards the said research area and would be glad for extended collaboration.

Relevant Articles:

1. Ahmad et al. "Devising and validating a pen-side hematological formula for hemoglobin estimation in Cholistani cattle." Tropical Animal Health and Production 54, no. 6 (2022a): 1-6.
2. Ahmad et al. "A preliminary study on devising a hematological formula for estimation of hemoglobin from packed cell volume in beetal goats." Arquivo Brasileiro de Medicina Veterinária e Zootecnia 74 (2022b): 77-82.
3. Ahmad et al. (2022c) “A study on packed cell volume for deducing hemoglobin: Cholistani camels in perspective” Plos One (Under Review)

Recently Published Articles

- Blood Transfusion in Equids-A Practical Approach and Review. Jamieson CA, Baillie SL, Johnson JP. Animals (Basel). 2022 Aug 23;12(17):2162. doi: 10.3390/ani12172162.
- The influence of leukoreduction on the acute transfusion-related complication rate in 455 dogs receiving 730 packed RBCs: 2014-2017. Davidow EB, Montgomery H, Mensing M. J Vet Emerg Crit Care (San Antonio). 2022 Jul;32(4):479-490. doi: 10.1111/vec.13175.
- Alloimmunization in dogs after transfusion: A serial cross-match study. Herter L, Weingart C, Merten N, Bock N, Merle R, Kohn B. J Vet Intern Med. 2022 Sep;36(5):1660-1668. doi: 10.1111/jvim.16521. Epub 2022 Aug 19.
- Whole blood transfusion in common marmosets: a clinical evaluation. Yurimoto T, Mineshige T, Shinohara H, Inoue T, Sasaki E. Exp Anim. 2022 May 20;71(2):131-138. doi: 10.1538/expanim.21-0134.
- Characterization of post-transfusion anti-FEA 1 alloantibodies in transfusion-naive FEA 1-negative cats. Cannavino A, LeVine D, Blais MC.J Feline Med Surg. 2022 Jun;24(6):e124-e130. doi: 10.1177/1098612X221094502.
- Transfusion of hyperimmune plasma for protecting foals against Rhodococcus equi pneumonia. Kahn SK, Cohen ND, Bordin AI, Coleman MC, Heird JC, Welsh TH Jr. Equine Vet J. 2022 Jul 14. doi: 10.1111/evj.13858. PMID: 35834170 Review.
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- Effect of leukoreduction on inflammation in critically ill dogs receiving red blood cell transfusions: A randomized blinded controlled clinical trial. Claus MA, Poh D, Smart L, Purcell SL, Boyd CJ, Sharp CR. J Vet Intern Med. 2022 Jul;36(4):1248-1257. doi: 10.1111/jvim.16487. Epub 2022 Jul 6.
- ZOOMICS: comparative metabolomics of red blood cells from dogs, cows, horses and donkeys during refrigerated storage for up to 42 days. Miglio A, Maslanka M, Di Tommaso M, Rocconi F, Nemkov T, Buehler PW, Antognoni MT, Spitalnik SL, D'Alessandro A. Blood Transfus. 2022 Jul 25. doi: 10.2450/2022.0118-22.
- Ex vivo evaluation of a novel cell salvage device to recover canine erythrocytes. Kalmukov IA, Galliano A, Godolphin J, Ferreira R, Cardoso I, Norgate DJ, Bacon NJ. Vet Surg. 2022 Sep 5. doi: 10.1111/vsu.13875.
- Evaluation of the utility and accuracy of body fluids containing red blood cells to determine canine and feline blood types. Garcia-Arce M, Breheny CR, Boag AM, Llewellyn EA. J Vet Emerg Crit Care (San Antonio). 2022 Sep 21. doi: 10.1111/vec.13259.
- Therapeutic plasma exchange for the management of a type III hypersensitivity reaction and suspected immune-mediated vasculitis assumed to be caused by human albumin administration in a dog. Klainbart S, Segev G, Kelmer E, Chen H. J Vet Emerg Crit Care (San Antonio). 2022 Jul;32(4):532-538. doi: 10.1111/vec.13188.

Recently Published Articles - continued

- Comparison of a commercial immunochromatographic strip crossmatch kit and standard laboratory crossmatch methods for blood transfusion compatibility in dogs. Zaremba RM, Brooks AC, Thomovsky EJ, Moore GE, Johnson PA. J Vet Emerg Crit Care (San Antonio). 2022 Sep;32(5):582-591. doi: 10.1111/vec.13219.
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- Hematological Parameters from the Feline Blood Donor to the Blood Unit: What Changes Are to Be Expected? Vascellari M, Carminato A, De Zottis G, Bisconti M, Gagliazzo L, Bozzato E, Bertazzo V, Stefani A. Animals (Basel). 2022 Jul 16;12(14):1819. doi: 10.3390/ani12141819.
- A comparative analysis of extracellular vesicles (EVs) from human and feline plasma. Howard J, Wynne K, Moldenhauer E, Clarke P, Maguire C, Bollard S, Yin X, Brennan L, Mooney L, Fitzsimons S, Halasz M, Aluri ER, Brougham DF, Kolch W, Dwyer RM, Potter S, Kelly P, McCann A. Sci Rep. 2022 Jun 27;12(1):10851. doi:10.1038/s41598-022-14211-z.
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- Centrifugal therapeutic plasma exchange in dogs with immune-mediated hemolytic anemia (2016-2018): 7 cases. Culler CA, Vigani A, Ripoll AZ, Gareau A, Suter SE. J Vet Emerg Crit Care (San Antonio). 2022 Sep;32(5):645-652. doi: 10.1111/vec.13196
- Autologous blood pleurodesis for surgical pneumothorax and outcome with multimodal cancer treatment in a dog with primary pulmonary mast cell tumor. Shinsako D, Masyr AR, Vieson M, Gleason HE. Clin Case Rep. 2022 Jul 25;10(7):e6123. doi: 10.1002/ccr3.6123.
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AVHTM
ASSOCIATION OF VETERINARY HEMATOLOGY AND TRANSFUSION MEDICINE

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AHVTM is an IRS approved 501(c)(3) nonprofit professional association composed of veterinarians, hematologists, academics, veterinary technicians, blood bankers, and interested public who desire to further scientific advances in transfusion medicine and veterinary hematology.

We engage in veterinary research, promote industry standards, develop guidelines for canine and feline blood collection and processing, and publish scientific research in peer-reviewed publications.

Visit us online to learn more about AVHTM!

MEMBERSHIP BENEFITS

As an AVHTM member, you are eligible for the following:

- Reduced IVECCS registration fee (veterinarians save $100 and technicians save $25!)
- Access the a "Members Only" section of the AVHTM website, which includes access to:
  - Other AVHTM profiles
  - PubMed articles
  - Forum for posting questions, cases, and research
- Ability to ask and answer questions posted to the AVHTM members-only Google group.

Please feel welcome to share this newsletter with interested colleagues and encourage them to become an AVHTM member!