INVESTIGATION OF A NOVEL TREATMENT FOR ELEPHANT ENDOTHELIOTROPIC HERPESVIRUS HEMORRHAGIC DISEASE

Jennifer Kishbaugh, DVM,[1] Suzan Murray, DVM, Dipl ACZM,[1] Dennis Schmitt, DVM, PhD, DACT[2], Carlos Sanchez, DVM, MSc,[3] Janelle Ober,[4] Anne Hale, DVM[4]

[1]Smithsonian Global Health Program, Smithsonian National Zoological Park and Conservation Biology Institute, Washington, DC, 20008, USA; [2]International Elephant Foundation, Azle, TX, 76098, USA; [3]Fort Worth Zoo, Fort Worth TX 76110, USA; [4]Cellphire Laboratories, Rockville, MD 20850

BACKGROUND

- EEHV is the leading cause of death in young, captive Asian elephants (1-15 years old) [7]
- Clinical disease involves severe hemorrhagic disease (EEHVHD) and rapid mortality within 24-48 hours of onset of signs. [1]
- Effective treatment remains elusive
- Development of freeze-dried platelet product in human and canine medicine serve as template for potential new treatment in elephants
- New technology offers the ability to provide a necessary blood product while removing many of the limiting factors in transfusion medicine that have previously prohibited their application in zoological species[3]

Figure 1: Shanthi and Kandula, Smithsonian's National Zoological Park

WHY PLATELETS?

- Studies across numerous species demonstrate that platelets play a critical role in the survival of gravely ill patients. [4]
- Rapid loss of platelets during hemorrhage and vascular leakage, further contributing to blood loss and platelet depletion, leading to the body being unable to control or compensate for blood loss.
- Replacement of circulating platelets may provide a means to withstand thrombocytopenic crisis and blood loss, as observed in human cases of viral hemorrhagic fevers.
- Medical developments have led to freeze-dried platelets as a tool in the treatment of catastrophic blood loss, particularly in cases of hemorrhagic viral disease.

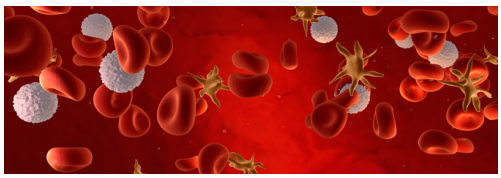

Figure 2: Diagram of platelets in blood stream; courtesy of Cellphire Inc.

Figure 3: Discussing blood collection methods; courtesy of Ringling Bros. Center for Elephant Conservation

OBJECTIVES

- Evaluate Asian elephant platelet for complete characterization and determination of quality control measures for generated platelet product.
- Generate initial lyophilized product for testing and quality control
- Establish laboratory standards for generation of Asian elephant platelet product
- Begin discussion and exploration of clinical trial pursuits in clinically ill elephants

TECHNOLOGICAL DEVELOPMENT

- Current platelet transfusion options include fresh whole blood, fresh platelets, platelet rich plasma (PRP), cold-stored platelets, and cryopreserved platelets[2]
- Development of lyophilized (freeze-dried) platelet product in human and canine medicine
- Shelf life 24-36 months at room temperature
  - Easily reconstituted with sterile water
  - Functional platelet recover >85%

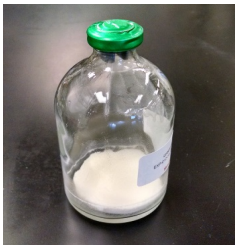

Figure 4: Lyophilized platelet dose; courtesy of Cellphire, Inc.

WAY FORWARD

- Complete characterization of Asian elephant platelets scheduled for publication in the beginning of 2018
- Gathering funding and additional resources needed for mass production of platelet product for supply of clinical trial
- Evaluating interest in participation in clinical trial
- Develop clinical trial guidelines including inclusion/exclusion criteria
- Expect product to be highly successful and readily available to zoological and other elephant care facilities

Figure 5: Baby Kandula, courtesy of Smithsonian's National Zoological Park

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