Viper Bites in Cats

Vipera palaestinae, the most common venomous snake in Israel, causes the most snake bites in humans and animals in that country. Viper venom contains many compounds (eg, hemorrhagins, thrombins, cytolysin) that can cause local effects at the site of the bite as well as systemic effects and severe complications.

It has been hypothesized that cats are more resistant than other species (eg, dogs) to venomous snake bites. This retrospective study analyzed the clinical signs, treatments, complications, and outcomes in 18 cats envenomed by *V palaestinae* in Israel. The authors found that all envenomations occurred during the hot, dry season (ie, May to October). The most common clinical signs were tachypnea, lameness, depression, fang-penetration marks, hypothermia, hematoma at the bite site, tachycardia, and bradycardia. Bloodwork often showed thrombocytopenia, hemoconcentration, leukocytosis, prolonged coagulation times, elevated serum creatine kinase activity, and hyperglycemia. Factors associated with death were lower body weight, lower initial rectal temperature, lower hematocrit, and lower total plasma protein. The mortality rate was 22%; this indicates that cats may not have an increased resistance to venom from snake bites.

Commentary

V palaestinae is found in the Middle East, but other vipers are found worldwide. The specific insight is that cats experience equal or higher mortality following *Vipera* spp envenomations as dogs, in contrast to claims that cats demonstrate resistance to the venom. This may be because of cats' small size in relation to the venom dose or cats being more likely to be bitten while unsupervised, which can cause a delay in receiving veterinary attention. Because of the small numbers of cats in this study, no inference can be made on treatment efficacy, but it is likely that cats should be treated in a similar way to dogs. Cats in areas frequented by snakes should be kept indoors if possible.—*Elizabeth A. Rozanski, DVM, DACVIM, DACVECC*

Source

Lenchner I, Aroch I, Segev G, Kelmer E, Bruchim Y. A retrospective evaluation of *Vipera palaestinae* envenomation in 18 cats: (2006–2011). *JVECC*. 2014;24(4):437-443.

Research Note: New Anti-tick Antigens?

The castor bean tick (*Ixodes ricinus*), common in Europe, is closely related to the black-legged tick, *I scapularis*, commonly found in the United States. These ticks are vectors for human and animal diseases (eg, Lyme borreliosis, anaplasmosis, babesiosis, tick-borne encephalitis). Current research focuses on preventing tick-borne diseases by searching for suitable tick antigens that may be used for vaccine development, which is easier and less expensive than acaricide production. This study focused on 11 tick genes that encode proteins potentially involved in iron and heme metabolism.

Quantitative real-time PCR was used to determine gene expression profiles in different tick stages and tissues to identify target proteins that are upregulated during the blood meal. RNA interference technology was then used to assess the genes' importance in tick physiology. Immunization experiments were then performed on rabbits with recombinant proteins. The authors reported that 2 new antigens, ferrochelatase (FECH) and ferritin1 (FER1), showed an effect on tick fecundity, although to a lesser extent than previously seen with ferritin2 (FER2) vaccination. FER1 and FER2 are iron-metabolism genes; the specific function of FECH is unknown. Further research is needed into whether a vaccine with a combination of these antigens could increase efficacy of antitick and antitransmission vaccines.

Source

Hajdusek O, Sima R, Perner J, Loosova G, Harcubova A, Kopacek P. Tick iron and heme metabolism – new target for an anti-tick intervention. *Ticks Tick Borne Dis*. 2016;7(4):565-572.