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Type III Hypersensitivity Reactions in Critically Ill Dogs

Type III hypersensitivity reactions (HRs) are delayed immune responses to an antigenic substance. Immune complexes from this reaction can deposit in blood vessel walls, glomeruli, and synovia, causing a cascade of responses that can lead to vasculitis, glomerulonephritis, or arthritis. Type III HRs to human serum albumin (HSA) have been documented in healthy dogs. Clinical signs can include lethargy, edema, vasculitis, ecchymoses, lameness, fever, vomiting, hypovolemic shock, oliguria, and death. HSA is used in both humans and dogs to treat significant hypoalbuminemia. The authors described the first documented type III HR occurring in critically ill dogs given HSA.

The first patient was a 6-year-old spayed rottweiler with a septic abdomen caused by small intestinal perforation. The dog was taken to surgery, developed hypoalbuminemia, and was treated with HSA. Sixteen days later, the dog demonstrated signs of a type III HR. The second patient, a

10-year-old castrated Norwegian elkhound, was surgically treated to remove an intestinal foreign body and administered HSA; signs of a type III HR developed 8 days later. Skin biopsies from both dogs showed epidermal pallor, edema, hemorrhage, degenerative neutrophilic perivascular infiltrates, and multifocal areas of neutrophilic or leukocytoclastic vasculitis. Immunohistochemical staining also suggested HSA antigen-antibody complex deposition in the dermis.

Treatment for the reactions included steroids and antihistamines; both dogs recovered from the HR with no further sequelae.

■ Commentary

HSA has previously been reported to cause delayed HRs in healthy dogs, and there is a common perception that critically ill dogs are not susceptible or less

susceptible to HRs after HSA infusion. This article provided a summary of type III HRs and described 2 dogs that postoperatively received HSA for treatment of severe hypoalbuminemia. Both dogs developed peripheral edema, and skin biopsies showed convincing evidence of a type III hypersensitivity reaction. The take-home: critically ill dogs are also susceptible to the development of HRs.—

Daniel S. Foy, MS, DVM, DACVIM, DACVECC



■ ■ Source

Type III hypersensitivity reaction with immune complex deposition in 2 critically ill dogs administered human serum albumin. Powell C, Thompson L, Murtaugh RJ. *JVECC* 23:598-604, 2013.

More Than One Way to Kill a Fungus: Testing Cleaning Products

Dermatophytosis is treated with topical and systemic antifungal therapy, confinement to an easily cleaned area, and routine cleansing and disinfecting of that area. Disinfecting the environment involves hard cleaning (ie, removal of gross particles until visibly clean) followed by application of a disinfectant to kill remaining spores. Accelerated hydrogen peroxide (AHP) agents differ from over-the-counter (OTC) cleaning agents because they contain surfactants and wetting and chelating agents. This in vitro study investigated the effectiveness of AHP compared with sodium hypochlorite (household bleach) and OTC hydrogen peroxide on the conidial and naturally infective spore form of *Microsporum* and *Trichophyton* spp cultures. The AHP products tested had good efficacy against conidial and naturally

infective spore challenges. Results showed the products were stable and retained effectiveness for at least 1 year after opened. AHP products were a better alternative to sodium hypochlorite because they were minimally odorous, noncorrosive, and had a Hazardous Materials Identification Score of 0 for health, flammability, and reactivity; however, skin contact with the AHP concentrates resulted in a stinging sensation that lasted several minutes despite rinsing with water immediately after contact.

■ Commentary

Curing dermatophyte infections can be particularly problematic with ongoing environmental contamination. In addition, patient immune status (based on age, nutritional status, presence of concurrent

disease) is equally important. Exposure to environmental disinfectants can be hazardous to humans and the patients being treated; care must be taken to minimize exposure while also adhering to a decontamination protocol. AHP agents may be useful during the decontamination process and have fewer toxic adverse effects; however, these products must still be handled with care (eg, gloves, goggles).

—Heather Troyer, DVM, DABVP, CVA

■ ■ Source

Efficacy of disinfectants containing accelerated hydrogen peroxide against conidial arthrospores and isolated infective spores of *Microsporum canis* and *Trichophyton* sp. Moriello K, Hondzo H. *VET DERMATOL* 25:191-e48, 2014.

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