ToxiBan Suspension and ToxiBan Suspension with Sorbitol

**DESCRIPTION**

ToxiBan® Granules, ToxiBan® Suspension and ToxiBan Suspension with Sorbitol are intended for use as adsorbers of orally ingested toxicants. ToxiBan® Granules contain 47.5% MedChar®, 10% Kaolin, 20% Sorbitol and 42.5% wet- and dispersing agents, including sorbitol, and is free-flowing and wettable for rapid restitution in water. It may also be mixed in the dry form with food.

ToxiBan® Suspension contains 10.4% charcoal and 6.25% kaolin in an aqueous base. It is a stable suspension which is intended for use as a conventional emergency treatment of small animals or small numbers of large animals.

ToxiBan® Suspension with Sorbitol is a ready-to-use, activated charcoal suspension containing 10% MedChar®, 10% sorbitol and 6.25% kaolin in an aqueous base with special suspending agents and preservatives intended for use as an emergency treatment of small animals.

**CLINICAL PHARMACOLOGY**

Activated charcoal is the most valuable single emergency antidote, since it acts by inactivating many organic toxicants by adsorption, a surface-active phenomenon. It is considered a universal antidote. Charcoal, with a small particle size, is the most effective; plant charcoal is more effective than animal charcoal. Most organic ring compounds are adsorbed by charcoal in a more-or-less nondiscriminatory manner. Nevertheless, adsorption sites are somewhat selective and larger heterocyclic molecules may be adsorbed competitively in place of smaller molecules. Therefore, the dose of charcoal needed to inactivate a given dose of toxicant depends on the following factors: (1) the intrinsic activity of the toxicant type; (2) the dose of toxicant; (3) the types and amounts of other competitive compounds in the gastrointestinal ingesta. It has been reported that 1 gram of activated charcoal would absorb the following substances in the amounts (in mg) indicated in parentheses: mercuric chloride (1800), sulfanilamide (1000), strychnine nitrate (950), morphine hydrochloride (800), atropine sulfate (700), nicotine sulfate (550), salicylic acid (450), phenol (400), phenobarbital (350), and ethanol (300). These data were derived from in vitro aqueous solutions, however, and do not reflect the true situation in the gastrointestinal compartiments. In vivo systems, natural substances in ingesta adsorb or absorb low levels of most toxicants. Conversely, normal non-toxic compounds present in ingesta compete for binding sites on orally administered charcoal.

It has been determined that charcoal inactivation of a toxicant in gastrointestinal content appears to be approximately stoichiometric and dose related in a linear fashion up to 70% to 85%. Above these levels increased levels of charcoal are needed to improve the percent of inactivation. This has been shown to occur with strychnine in canine gastric contents and phorate and carbofuran in bovine rumen fluids. See Graph.

As a general rule it is safe to assume that 1 gram of MedChar activated charcoal will adsorb 70 mg to 90 mg of an ingested organic toxicant.

Sorbitol is a hexahydric sugar alcohol which primarily serves as an osmotic cathartic. It is poorly absorbed during its transit through the gastrointestinal tract. Sorbitol that is absorbed is metabolized by the liver and slowly converted to fructose. Insulin is not necessary for intracellular transport of sorbitol. Therefore, customary cathartic doses can be safely used in animals with diabetes mellitus.

As a hyperosmotic cathartic, sorbitol produces a hygroscopic action resulting in increased water in the large intestine and increased intraluminal pressure which stimulates catharsis. Sorbitol does not compromise the adsorptive capacity of activated charcoal. Activated charcoal given alone becomes stationary in the gastrointestinal tract, releasing its adsorbed toxicant which may subsequently become absorbed by the intestinal mucosa to again produce toxicoses. Sorbitol is an effective cathartic for use with activated charcoal in monogastric animals. It promotes passage of the activated charcoal and adsorbed toxicant via the feces.

Kaolin is a naturally occurring hydrated aluminum silicate which is powdered and refined for pharmaceutical use. It is not absorbed from the gut after oral administration. Colloidal kaolin is an intestinal protectant and is used in refined GI mucosa. Its well-known adsorptive properties in removing bacteria and endotoxins from gastrointestinal contents aid in preventing absorption of these and other GI toxins.

**INDICATIONS AND USAGE**

ToxiBan® Granules, ToxiBan® Suspension and ToxiBan Suspension with Sorbitol are most effective when administered as soon as ingestion of a toxicant is suspected. They can also be used in some toxic emergencies when absorption of the toxicant is nearly complete or the exposure was via a parenteral route. This application usually involves repet- itive or multiple dose activated charcoal use. Multiple doses of charcoal may be useful in adsorbing toxins which undergo enterohepatic circulation. Drugs such as digitoxin which are subject to biliary excretion are constantly recycled into the gastrointestinal tract and are reabsorbed resulting in prolonged toxicity. Frequent doses of activated charcoal can adsorb those toxins, interrupt the enterohepatic circulation, thereby preventing their reab- sorption, and enhance toxicant elimination from the body into the gastrointestinal tract. Treatment with ToxiBan® should be designed to inactivate at least 80% of an ingested toxicant. Normal body detoxification mechanisms combined with specific or symptomatic antidotal therapy are used to inactivate or counteract the toxicant that is not adsorbed by ToxiBan.

Adsorption of a toxin can occur anywhere along the gastrointestinal tract. However, to be most effective, ToxiBan® should be administered as soon as ingestion of a toxicant is suspected or at the onset of signs of toxicity. If an oral emetic, such as syrup of ipecac, hydrogen peroxide, or activated charcoal is used, ToxiBan® should not be used until after induction. There should be a delay of thirty to sixty minutes between the conclusion of emesis and the administration of ToxiBan® Granules, ToxiBan® Suspension or ToxiBan Suspension with Sorbitol to avoid regurgitation of the treatment.

When gastric lavage is used to facilitate stomach evacuation, a single dose of ToxiBan® may be administered in the early stages of this procedure. The primary advantage of using ToxiBan® with gastric lavage is that early administration of activated charcoal permits prompt adsorption of the toxicant. The only disadvantage is that the lavage returns will be black, thus making it difficult to visually evaluate the ingesta. Only ToxiBan Suspension or Granules should be used with this technique. After completion of the lavage procedure, ToxiBan® Suspension with Sorbitol may be administered via the lavage tube before its removal.

**HOW SUPPLIED**

ToxiBan® Granules, 454 g (1 pound) 12 per carton (List No. 0423)

ToxiBan® Granules, 5 kg (11 pound) Pails (List No. 0422)

ToxiBan® Suspension, 240 milliliters 12 per carton (List No. 1151)

ToxiBan® Suspension with Sorbitol, 240 milliliters 12 per carton (List No. 1155)

**BIBLIOGRAPHY**


Multiple dose activated charcoal is also used in what is termed gastrointestinal decontamination in which the toxin passively diffuses along a concentration gradient between blood perfusing the gastrointestinal tract and the luminal fluids. Multiple treatment doses adsorb the toxin and prevent it from excess CNS stimulation. Signs of poisoning by carbamates and O-P pesticides are usually evident within minutes to hours after ingestion, but may be delayed for several days in the case of systemic O-P compounds, such as coumaphos and nufin.

Activated charcoal is a highly porous, adsorptive solid. It is used in many settings for the removal of xenobiotics, fluid therapy, and restoration of acid-base balance by adding sodium bicarbonate at about 2 mg per kg mixed in the slurry with the ToxiBan. Charcoal has been reported to adsorb million solids, but is not considered a generally satisfactory antidote for heavy metal poisoning.

ToxiBan is indicated in garlic poisoning of dogs.

CONTRAINDICATIONS

There are no known absolute contraindications to the use of activated charcoal. However, because charcoal has been shown to adsorb certain drugs, charcoal should not be used in those situations where the patient’s absorption and excretion of certain already absorbed drugs or toxicants. An example of the latter is the hastening of excretion of chlorinated hydrocarbon insecticides from body fat of food-producing animals. When ToxiBan is administered repeatedly on a daily basis, ToxiBan will adsorb an array of oral antihistamines, as well as antibiotics, when used concurrently with such drugs.

Chlorinated Hydrocarbon Insecticides

Chemicals in this group include aldrin, dieldrin, dieldrin, endrin, heptachlor, letane, hexane, methoxychlor, parathion, TDS, and toxaphene. Clinical signs of poisoning from these compounds usually occur within 24 hours after ingestion or dental application and are characterized by weakness, ataxia, depression, and muscular convulsions. ToxiBan should be administered whenever signs are noted. It may be necessary to continue dosing through the convulsions. ToxiBan should be administered whenever signs are noted. It may be necessary to continue dosing through the convulsions.

Atropine sulfate is the preferred pharmacologic antidote for carbamates and O-P pesticides. The recommended dosage is 0.5 mg/kg body weight. The average horse may receive 25 mg and the average dairy cow 10 mg. If animals are known or thought to have ingested any of these toxicants, ToxiBan should be given first followed by atropine when signs first appear. Atropinization usually lasts 2 to 4 hours, and if signs persist, atropine injections should be repeated every 2 to 4 hours. Two or three doses of atropine injections may be necessary. ToxiBan administration should be repeated every 6 to 8 hours until signs subside.

Organophosphate Insecticides

These chemicals include benayon, BUX, cabaryl, carburedat, and landrin. The organophosphate (O-P) and carbamate insecticides have replaced the chlorinated hydrocarbons for agricultural use. Both of these types of chemicals are acetylcholinesterase inhibitors, and acute toxicity is due to over stimulation of the parasympathetic nervous system. Signs generally include salivation, gastrointestinal hypermotility, diaphoresis, miosis, twitching and stiffness of skeletal muscles. Small animals may exhibit CNS depression, dribbling of saliva with occasional convulsions, and miosis. The toxicosis is due to the ingestion of O-P insecticides or their derivatives. ToxiBan should be given in the following dosages:

ToxiBan can be used in cases of toxic bacterial enteritis and in ruminants with toxic overgrowth of bacteria. The recommended dosage is 2 to 4 g per kg (1 to 2 g per pound) body weight.

Miscellaneous Use for ToxiBan

ToxiBan is indicated whenever synthetic organic drugs have been administered accidentally or mistakenly in the past. ToxiBan is not to be used in the treatment of blastants, narcotics, salicylates, and barbiturates. The use of ToxiBan prior to the administration of any of these drugs is to be avoided.