**DESCRIPTION**

ToxiBan® Granules, ToxiBan® Suspension and ToxiBan® Suspension with Sorbitol are intended for use as adsorbents of orally ingested toxicants.

**ToxiBan® Granules** contain 47.5% activated charcoal, 10% Kaolin, 20% Sorbitol and 42.5% water. The granules are ideal for small animals, including birds, free-flowing and wettable for rapid reconstitution in water. It may also be mixed in the dry form with food.

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

**ToxiBan® Suspension with Sorbitol** is a convenient, ready-to-use, activated charcoal suspension containing 10% activated charcoal, 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.

**ToxiBan® Suspension** contains 47.5% activated charcoal and 6.25% kaolin in an aqueous base. It is a basic suspension which is intended for use as a convenient emergency treatment of small animals or small numbers of large animals. It may also be mixed in the dry form with food.

**CLINICAL PHARMACOLOGY**

Activated charcoal is the most valuable single emergency antidote, since it acts by inactivating many organic toxics by adsorption, a surface-active phenomenon. It is considered a universal antidote. Charcoal, with a small particle size, is 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 charcoal 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 adsorb the following substances in the amounts (in mg) indicated in parentheses: mercuric chloride (1800), sulfuramidine (1000), strychnine nitrate (950), morphine hydrochloride (800), atropine sulfate (700), nicotine (700), salicylic acid (550), phenol (400), phenoxybarbital (350), and alcohol (300). These estimates were derived from in vitro aqueous solutions, however, and do not reflect the true situation in the gastrointestinal compartments. In vivo, natural substances in ingesta adsorb or absorb low levels of most toxics. Conversely, normally non-toxic compounds present in ingesta compete for binding sites on charcoal.

It has been determined that charcoal inactivation of a toxicant in gastrointestinal contents 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. It has been shown that the amount of charcoal needed to inactivate a given dose of toxicant depends on the following factors: (1) the intrinsic activity of the charcoal type; (2) the dose of toxicant; (3) the types and amounts of other competitive compounds in the gastrointestinal ingesta. Activated charcoal can adsorb a toxicant from any position along the gastrointestinal tract. It is prophylactically useful in the prevention of toxicosis, and is most effective when administered as soon as ingestion of a toxicant is suspected. However, it can also be used in some toxic emergencies when absorption of the toxicant is nearly complete or the exposure was via the parenteral route. This application is usually ineffective for multiple dose activated charcoal use. Multiple doses of charcoal may be useful in adsorbing toxins which undergo enterohepatic circulation. Drugs such as digoxin which are subject to biliary secretion are constantly secreted into the gastrointestinal tract and are reabsorbed resulting in prolonged toxicity. Frequent doses of activated charcoal can adsorb those toxins that are adsorbed after enterohepatic circulation, thereby preventing their reabsorption, 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 anti-toxic therapy are used to inactivate or counteract the toxicant that is not adsorbed by activated charcoal.

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

Sorbitol is a hexahydrate 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 intraluminal transport of sorbitol. Therefore, customary cathartic doses can be safely used by animals with diabetes mellitus.

As a hygroscopic 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 toxin which may subsequently be 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 toxin 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 for inflamed 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 the parenteral route. This application is usually ineffective for multiple dose activated charcoal use. Multiple doses of charcoal may be useful in adsorbing toxins which undergo enterohepatic circulation. Drugs such as digoxin which are subject to biliary secretion are constantly secreted into the gastrointestinal tract and are reabsorbed resulting in prolonged toxicity. Frequent doses of activated charcoal can adsorb those toxins that are adsorbed after enterohepatic circulation, thereby preventing their reabsorption, 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 anti-toxic therapy are used to inactivate or counteract the toxicant that is not adsorbed by activated charcoal.

Absorption of a toxin can occur anywhere along the gastrointestinal tract. However, to to effectively, ToxiBan should be administered as soon as ingestion of a toxicant is suspected or at the onset of signs of toxicity. If a delay occurs, such as with symptomatic agents, an oral emetic, such as syrup of ipecac, hydrogen peroxide, or apomorphine is used, ToxiBan should not be used until the symptoms have resolved. ToxiBan Suspension should be used in monogastric animals. It promotes passage of the activated charcoal and adsorbed toxin via the feces.

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the gastrointestinal tract and the luminal fluids. Multiple treatment doses adsorb the toxin present. ToxiBan Granules in further maximizes the concentration gradient which permits diffusion of even more toxin into the GI tract. While not all toxins respond to this treatment, treatment is recommended regardless of outcome. Carboxyhemoglobin levels are effectively eliminated in this way. Phenobarbital and theophylline are examples of toxins which can be eliminated more rapidly using this concept.

ToxiBan Suspension with Sorbitol should not be used in the dose of the multiple dose activated charcoal treatment unless it is necessary to achieve catharsis. Since ToxiBan Suspension with Sorbitol contains sorbitol, it may produce excessive catharsis and resultant fluid and electrolyte disturbances. Activated charcoal is administered at each dosage interval (SEE PRECAUTION). ToxiBan Suspension should be used at the dosage intervals when ToxiBan Suspension with Sorbitol is not being used.

Catharsis should only be used intermittently during multiple dose activated charcoal use.

There are no specific recommendations established for when to stop multiple dose charcoal therapy. Clinical judgment should be used in conjunction with consideration of which toxins are involved and the concentration gradient which permits diffusion of even more toxin into the GI tract. While not all toxins respond to this treatment, treatment is recommended regardless of outcome. Carboxyhemoglobin levels are effectively eliminated in this way. Phenobarbital and theophylline are examples of toxins which can be eliminated more rapidly using this concept.

Small Animals - 2 to 4 grams per kg (1 to 2 grams per pound) body weight. One pound (453.6 grams) will normally 6 hours for 24 to 48 hours may interrupt the hepatoenteric circulation of the toxicant in animals known or suspected to have ingested a toxic alkaloid should be given prophylactic doses of ToxiBan.

Infusion followed by artificial respiration and administration of oxygen. Animals known or suspected to have ingested a toxic alkaloid should be given prophylactic doses of ToxiBan.

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