ANTIFREEZE

Why do cats & dogs lick or drink antifreeze?

Because it tastes sweet due to the "glycol" sugar base.

There are three common types of antifreeze: ethylene glycol, propylene glycol and methanol.

ETHYLENE GLYCOL

Source

Ethylene glycol is found in various compounds, and is the main component of many forms of automotive antifreeze and other engine coolants. It can also be found in a number of industrial solvents, rust removers and color film processing fluids.

Symptoms

First Phase (1-4 hours)

- Incoordination (acting “drunk”), stumbling, swaying
- Increased respiratory rate / panting
- Increased thirst

Second Phase (4-6 hours):

- Anorexia (no interest in food)
- Depression
- Vomiting
- Decreased body temperature
- Coma

Third Phase (after 6 hours):

- Severe vomiting
- Severe anorexia and depression
- Coma
- Seizures
- Minimal to no urine production

Toxicity

Ethylene glycol is metabolized to glycolic acid, which is further metabolized to form very toxic compounds. The kidneys can become severely and permanently damaged from ethylene glycol exposure.

Diagnosis

Although ethylene glycol poisoning is definitively diagnosed by detecting the presence of ethylene glycol in the blood, other blood tests and a urinalysis can help confirm the diagnosis. Animals poisoned by ethylene glycol typically form a certain type of crystal in the urine known as calcium oxalates. Blood work shows progressive elevation of the kidney values as the toxicity manifests.

Treatment

Treatment is based on removing the ethylene glycol from the animal's body and/or preventing it from being broken down into toxic metabolites. Detoxification may include the induction of vomiting (within 20-40 minutes), feeding an activated charcoal suspension, and administering intravenous fluids. Inducing vomiting in animals that are already symptomatic is not recommended since they are at increased risk of aspirating their vomit. The drug 4-methylpyrrazole (4-MP) is the treatment of choice in treating dogs with ethylene glycol intoxication. 4-MP has been proven to be effective in dogs, but not in other veterinary species as of yet. This drug, although expensive, can prevent the ethylene glycol from being broken down into toxic compounds if administered within the first several hours after exposure. Giving ethanol intravenously can have the same effect as 4-MP, and is an alternative therapeutic choice when 4-MP is not available.

Prognosis

Prognosis is based on the amount of ethylene glycol ingested as well as the length of time that elapses between exposure and treatment. Animals that are not treated promptly have a poor to guarded prognosis. If significant kidney damage has occurred from the toxic metabolites of the ethylene glycol, the only option for treatment is to attempt dialysis of the blood for multiple weeks in the hope that some kidney function may return.

PROPYLENE GLYCOL

Source

Like ethylene glycol, propylene glycol can be found in some forms of automotive antifreeze as well as other engine coolants. It is also present in a variety of food, pharmaceutical and cosmetic agents.

Symptoms

- Ataxia / Incoordination (acting "drunk")
- Increased respiratory rate / panting
- Anorexia
- Depression
- Vomiting
- Decreased body temperature
- Seizures

- Coma

Toxicity

Although it is not as toxic as ethylene glycol, significant ingestions of propylene glycol can lead to intoxication similar to that seen with other alcohols. Propylene glycol toxicity does not cause kidney damage the way ethylene glycol does.

Diagnosis

Although propylene glycol poisoning is definitively diagnosed by detecting its presence in the blood, other blood tests can help confirm the diagnosis.

Treatment

Treatment is based primarily on supportive medical care and aggressive IV fluid diuresis. Decontamination by inducing emesis can be attempted if the animal is asymptomatic and if the exposure was within 20-40 minutes.

Prognosis

The prognosis in cases of propylene glycol ingestion is usually good provided the animal receives prompt medical attention.

METHANOL (methyl alcohol, wood alcohol)

Source

Windshield washer fluid is the most commonly encountered form of methanol.

Symptoms

- Incoordination (acting “drunk”)
- Increased respiratory rate / panting
- Anorexia
- Depression
- Vomiting
- Diarrhea
- Decreased body temperature
- Seizures
- Coma

Toxicity

Methanol is metabolized to formic acid which causes acidosis and damages the central nervous system. Cardiac arrhythmias can also occur from methanol toxicity.

Diagnosis

Detection of metabolic acidosis on blood work combined with clinical signs and a history of exposure to windshield washer fluid (and not to ethylene or propylene glycol) is usually enough to establish a diagnosis.

Treatment

Treatment is based primarily on supportive medical care. Decontamination by inducing emesis can be attempted if the animal is asymptomatic and if the exposure was within 20-40 minutes.

Prognosis

The prognosis in cases of methanol ingestion is usually good provided the animal receives prompt medical attention.