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Ethylene glycol poisoning

Ethylene glycol is a colorless, odorless, sweet-tasting chemical. It is poisonous if swallowed.

Ethylene glycol may be swallowed accidentally, or it may be taken deliberately in a suicide attempt or as a substitute for drinking alcohol (ethanol). Most ethylene glycol poisonings occur due to the ingestion of antifreeze.

This article is for information only. DO NOT use it to treat or manage an actual poison exposure. If you or someone you are with has an exposure, call the local emergency number (such as 911), or your local poison control center can be reached directly by calling the national toll-free Poison Help hotline (1-800-222-1222) from anywhere in the United States.

Poisonous Ingredient

Ethylene glycol

Where Found

Ethylene glycol is found in many household products, including:

- Antifreeze
- Car wash fluids
- De-icing products
- Detergents
- Vehicle brake fluids
- Industrial solvents
- Paints
- Cosmetics

Note: This list may not be all-inclusive.

Symptoms

The first symptom of ethylene glycol ingestion is similar to the feeling caused by drinking alcohol (ethanol). Within a few hours, more toxic effects become apparent. Symptoms may include nausea, vomiting, convulsions, stupor (decreased level of alertness), or even coma.

Ethylene glycol toxicity should be suspected in anyone who is severely ill after drinking an unknown substance, especially if they at first appear drunk and you can't smell alcohol on their breath.

An overdose of ethylene glycol can damage the brain, lungs, liver, and kidneys. The poisoning causes disturbances in the body's chemistry, including metabolic acidosis (increased acids in the bloodstream and tissues). The disturbances may be severe enough to cause profound shock, organ failure, and death.

As little as 120 milliliters (approximately 4 fluid ounces) of ethylene glycol may be enough to kill an average-sized man.

Home Care

Seek medical help right away. DO NOT make a person throw up unless told to do so by the poison control center or a health care professional.

Before Calling Emergency

Determine the following information:

- The person's age, weight, and condition
- The name of the product (ingredients and strengths, if known)
- The time it was swallowed
- The amount swallowed

Poison Control

Your local poison control center can be reached directly by calling the national toll-free Poison Help hotline (1-800-222-1222) from anywhere in the United States. This national hotline will let you talk to experts in poisoning. They will give you further instructions.

This is a free and confidential service. All local poison control centers in the United States use this national number. You should call if you have any questions about poisoning or poison prevention. It does NOT need to be an emergency. You can call for any reason, 24 hours a day, 7 days a week.

Take the container with you to the hospital, if possible.

What to Expect at the Emergency Room

The health care provider will measure and monitor the person's vital signs, including temperature, pulse, breathing rate, and blood pressure.

Diagnosis of ethylene glycol toxicity is usually made through a combination of blood, urine, and other tests. Tests you may receive at the hospital include:

- Arterial blood gas analysis
- Chemistry panel and liver function studies
- Chest x-ray (shows fluids in the lungs)
- Complete blood count (CBC)

- CT scan (shows brain swelling)
- ECG (electrocardiogram, or heart tracing)
- Ethylene glycol blood test
- Ketones blood test
- Osmolality blood test
- Toxicology screen
- Urinalysis

Tests will show increased levels of ethylene glycol, blood chemical disturbances, and possible signs of kidney failure and muscle or liver damage.

Most people with ethylene glycol poisoning need to be admitted to a hospital, often to the intensive care unit (ICU) for close monitoring. A breathing machine (respirator) may be needed.

Those who recently (within 30 to 60 minutes of presentation to the emergency department) swallowed the ethylene glycol may have their stomach pumped (suctioned). This can help remove some of the poison.

Other treatments may include:

- Activated charcoal
- Sodium bicarbonate solution given through a vein (IV) to reverse severe acidosis
- An antidote (fomepizole) that slows the formation of the poisonous by-products in the body
- If fomepizole is unavailable, ethanol may be given. This is uncommon.

In severe cases, dialysis (kidney machine) may be used to directly remove the ethylene glycol and other poisonous substances from the blood. Dialysis reduces the time needed for the body to remove the toxins. Dialysis is also needed by people who develop severe kidney failure as a result of poisoning. It may be needed for many months and possibly years, afterward.

Outlook (Prognosis)

How well a person does depends on how quickly treatment is received, the amount swallowed, the organs affected, and other factors. When treatment is delayed, this type of poisoning can be deadly.

Complications may include:

- Brain and nerve damage, including seizures and changes in vision
- Kidney failure
- Shock (low blood pressure and depressed heart function)
- Coma

Alternative Names

Intoxication - ethylene glycol

References

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