SEVERE ETHYLENE GLYCOL INTOXICATION IN CHILDREN

A case-based review

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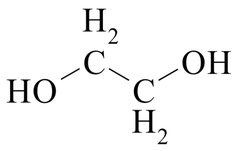
ETHYLENE GLYCOL (EG)

Ethylene glycol (C2H6O2) is an odorless, colorless, sweet-tasting toxic alcohol that is found in various household products. Intoxication is associated with severe neurological outcomes, renal impairment and mortality.

Toxic dose	**≥ 0,1ml/kg**
Lethal dose	**≥ 1,4ml/kg**



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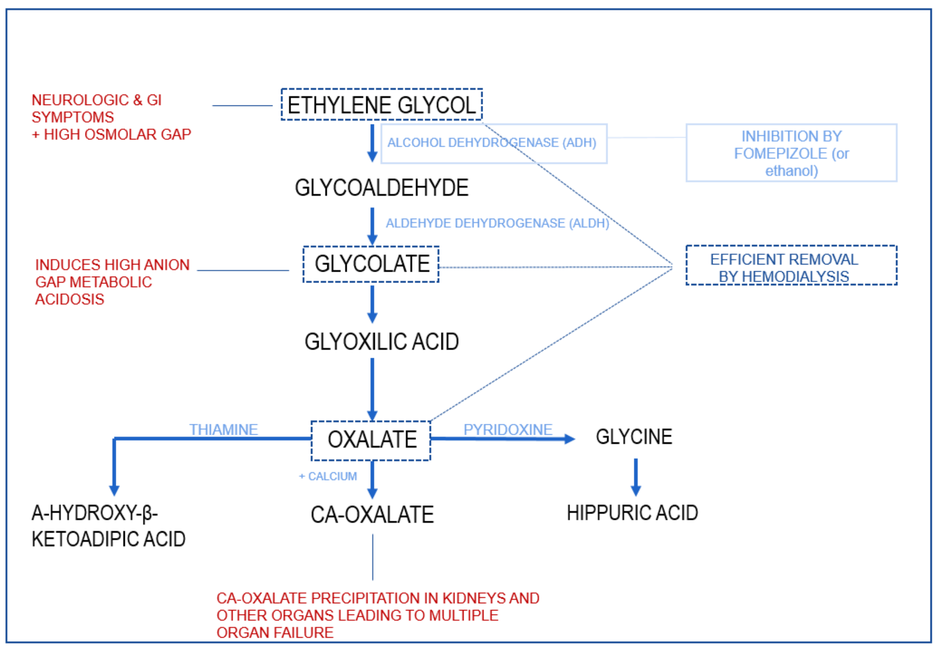


BLOOD PH AT PRESENTATION

pH	7,08	
pCO2	28,3	mmHg
HCO3-	8,5	mmol/l
BE	-20,1	mmol/l
Na	143	mmol/l
K	4,3	mmol/l
Cl	113	mmol/l
Lact	28	mmol/l
Gly	89	mg/dl
Anion gap	25,8	mmol/l

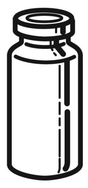
CASE

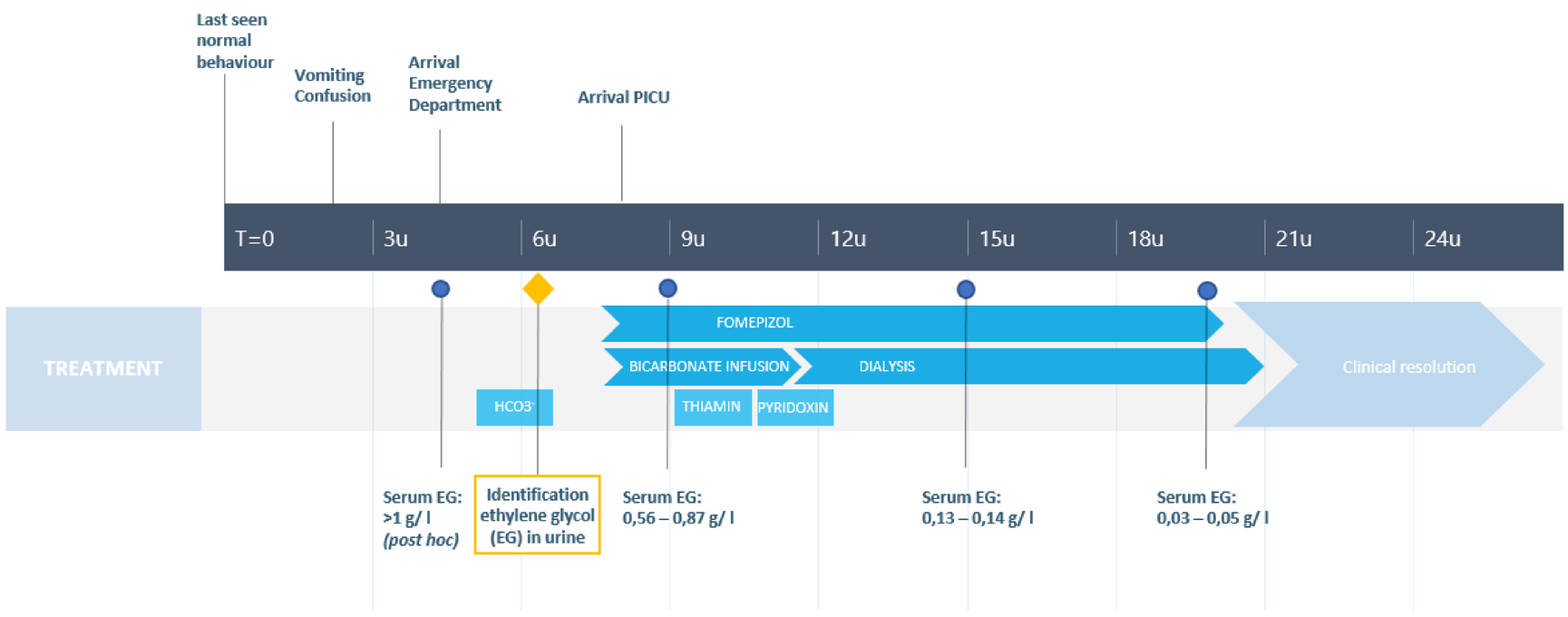
Two siblings (age 2 and 4) present in the emergency department with sudden onset of altered consciousness and vomiting. They are tachypneic and tachycardic but hemodynamically stable at presentation. Both are afebrile and show no signs of infection. Blood pH shows severe metabolic acidosis with high anion gap. Urine toxicology screen confirms ethylene glycol (EG) intoxication. They are transferred to PICU for antidote and dialysis.

ANTIDOTE

Fomepizol inhibits metabolisation of ethylene glycol to glycoaldehyde

Thiamin & **pyridoxin** are cofactors stimulating conversion of glycolate and glycoxylate into non-toxic metabolites



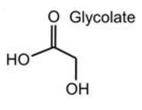


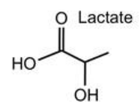
DIALYSIS

Efficiently removes ethylene glycol and it's toxic metabolites. Treshold in EG intoxication: metabolic acidosis and ethylene glycol levels > 0,2 g/l.

High lactate levels

Falsely elevated serum lactate concentration is an assay cross-reaction with glycolate





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About 100 calls per year of which 10% are children, mostly low-dose exposures.

IN SHORT

Severe EG intoxication typically presents with vomiting, altered consciousness and severe high-anion gap metabolic acidosis. Rapid recognition of this toxidrome allows early initiation of antidote (fomepizol) to block further enzymatic conversion to toxic metabolites. Subsequent hemodialysis eliminates the toxic alcohol and it's metabolites, resulting in full clinical and biochemical recovery of a potentially life-threatening intoxication.

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