Disclosure belangen spreker

(potentiële) belangenverstrengeling	Geen / Zie hieronder
Voor bijeenkomst mogelijk relevante relaties met bedrijven	Bedrijfsnamen
• Sponsoring of onderzoeksgeld • Honorarium of andere (financiële) vergoeding • Aandeelhouder • Andere relatie, namelijk …	• - • - • - • -

Ethyleneglycol intoxication

Case presentation

Severe intoxication: sent by hospital Boxmeer

Man, 30 years old, regular beer drinker

22-8; 3 AM

Took about 250 cc ethyleneglycol + alcohol + oxazepam

5 AM: ethanol concentration 1,7 gram/liter

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Presentation Radboudumc

- 6.40 AM
- Clinically no abnormalities
- Lab:

  Osmolality 350 mmol/l

  Na 145 mmol/l, glucose 5,5 mmol/l, ureum 4,3 mmol/l

  pH 7,40 Bicarbonaat 22,0 mmol/l

  Ethanol 1,09 g/l

  osmolgap due to ethanol: 1,09/0,0461 = 23,6

Osmol gap

- Osmol gap
- measured osmolality - (2 x Na + glucose + urea)
- 350 - (290 + 5,5 + 4,3) = 50,2

Normal osmol gap < 10 mosm

Contact NVIC

- This contains about 25-50% ethyleneglycol
- Weight 115 kg
- Calculated concentration 1375 mg/l
- >500 mg/l

Potentially SEVERE intoxication

Treatment criteria

Table 1. *Criteria for initiating antidotal therapy in ethylene glycol (EG) and methanol intoxication*[9,10,17,18]

Criteria
1. Documented plasma concentration ≥200 mg/l (3.2 mmol/l for EG and 6.2 mmol/l for methanol)
OR
2. Documented recent history of ingesting toxic amounts of EG/ methanol and osmolal gap >10 mOsm/l
OR
3. Suspected EG/methanol ingestion and at least 3 (for EG poisoning) or 2 (for methanol poisoning) of the following criteria: - Arterial pH <7.3 - Serum bicarbonate <20 mmol/l - Osmolal gap >10 mOsm/l - Oxalate crystalluria *(consider this criteria only for EG exposures)*

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Toxicology

Clinical picture
Similar tot ethanol, except for the smell of the breath.

1e phase (1-12 hr after ingestion):
depression CZS, nausea, vomiting, metabolic acidosis, seizure

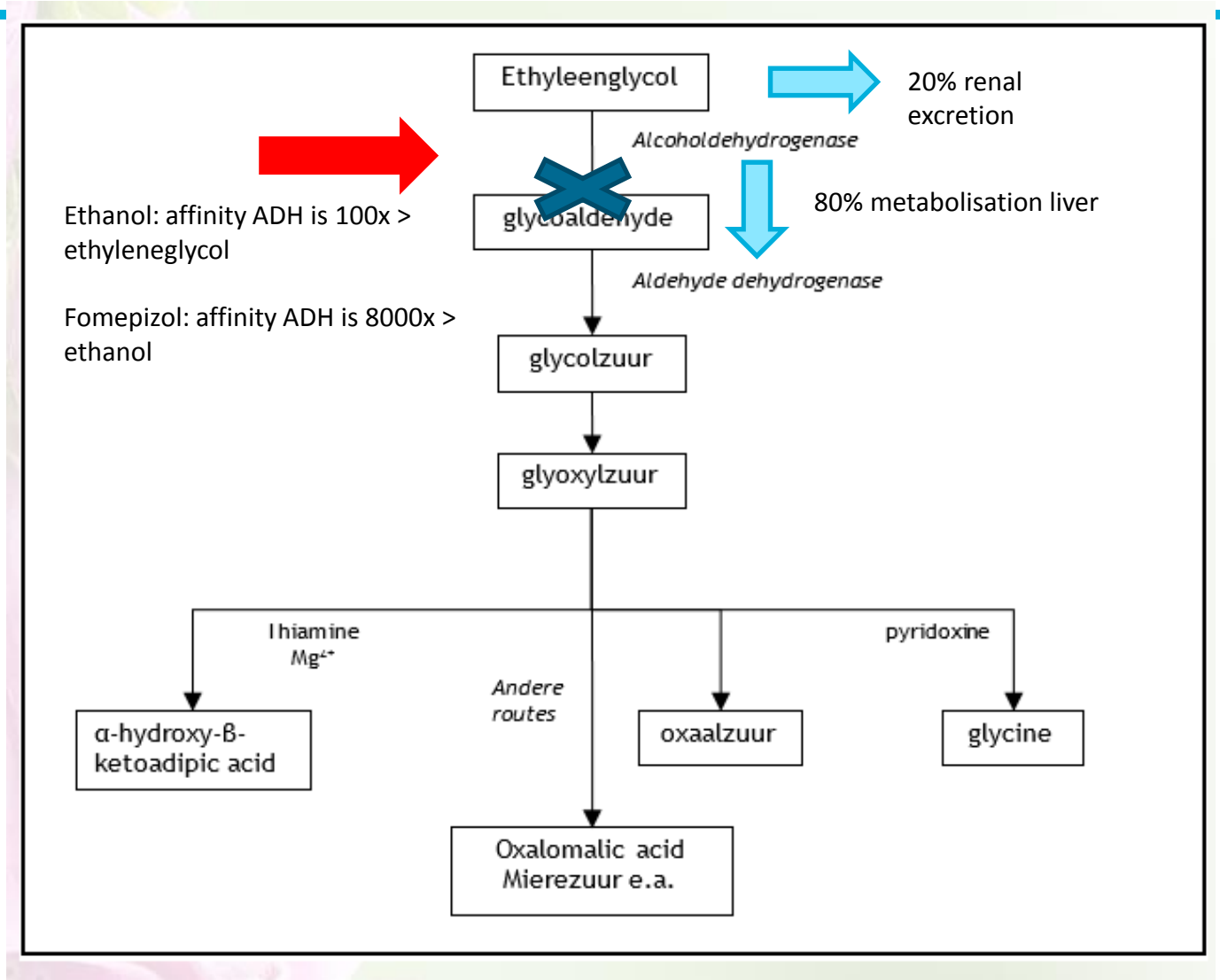
2e fase (12-24 hr after ingestion):
cardiopulmonary symptoms: tachycardia, tachypoe, mild hypertension, sometimes congestive heart failure and circulatory collaps.

3e fase (24-72 hr after ingestion):
renal symptomen: oliguria, flank pain, acute tubulary necrosis, renal failure (usually reversible).

10 AM

Ethyleneglycol concentration 1,13 g/l = 1130 mg/l

Ethanol 0,1 g/l


Ethyleenglycol
20% renal excretion
Alcoholdehydrogenase
80% metabolisation liver
Ethanol: affinity ADH is 100x > ethyleneglycol
glycoaldehyde
Fomepizol: affinity ADH is 8000x > ethanol
Aldehyde dehydrogenase
glycolzuur
glyoxylzuur
Thiamine
Mg2+
pyridoxine
Andere routes
α-hydroxy-β-ketoadipic acid
oxaalzuur
glycine
Oxalomalic acid
Mierezuur e.a.

Pharmacist, nephrologist, ICU, internist

No fomepizol available

Start ethanol infusion, how much?

Concentration should be 1,0-1,5 g/l

Loading dose?

Vd = weight 115 kg x 0,6 l/kg = 69 liter.

Target concentration is 1 gram/liter

So loading dose is 69 gram

However: there is still 0,1 gram per liter = 6,9 gram in the patient.

So loading dose = 62,1 gram =

1 vial = 10 ml ethanol 100% = 8 gram ethanol. So about 8 vials loading dose).

Maintenance dose?

In Boxmeer hospital 1,7 g/l in 70 l = 120 gram
In Radboudumc (100 min later) 1,1 g/l in 70l = 77 gram

So 43 grams ethanol metbolism in 1h and 40 minutes.
So metabolism 25,8 gram ethanol/h

So maintenance dose (1 vial 100% ethanol 10 ml = 8 gram) = 3 vials/hr = 30 ml/hr.

During hemodialysis: 8 gram(1 vial) per hour extra

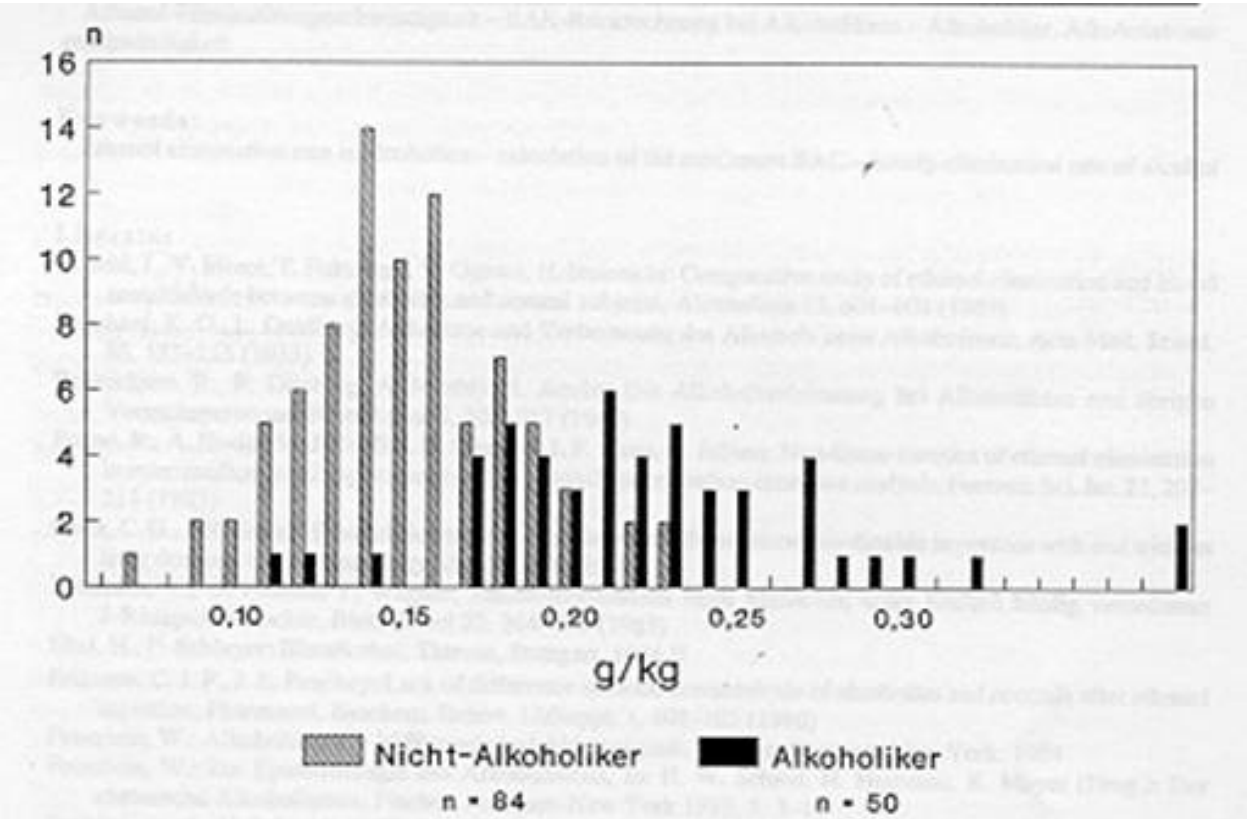


Abb. 1: Stundenabfallwerte bei Alkoholikern und Nicht-Alkoholikern

Next

15:35 start dialysis
Ethyleneglycol 0,71 g/l
Ethanol 0,71 g/l

19:49
Ethyleneglycol 0,22 g/l
Ethanol 1,56 g/l

23:30 stop dialysis

23-8 08:30
Ethyleneglycol: 0,09 g/l
Ethanol 1,41 g/l

23-8
Osmolality 326, osmolgap 36
ethanol 32,5 mosm/l
Stop treatment

CWZ

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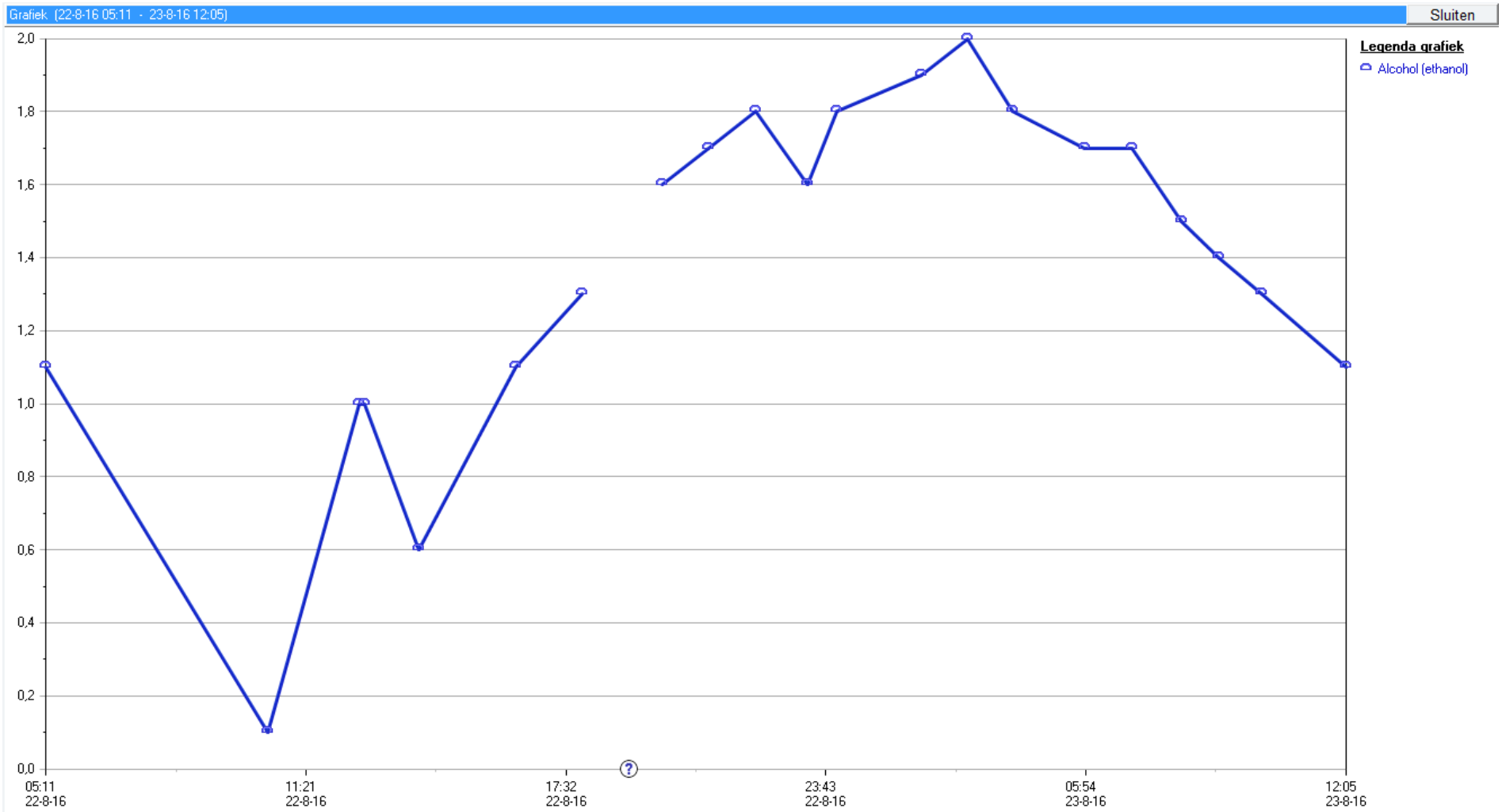
Grafiek (22-8-16 05:11 - 23-8-16 12:05)
Sluiten
Legenda grafiek
Alcohol (ethanol)
2,0
1,8
1,6
1,4
1,2
1,0
0,8
0,6
0,4
0,2
0,0
05:11
22-8-16
11:21
22-8-16
17:32
22-8-16
23:43
22-8-16
05:54
23-8-16
12:05
23-8-16

Ethylene glycol

Nice toxicokinetics

Alcohol prevents toxicity

Give the patient alcohol instead of coffee!!

CWZ

Radboudumc