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Surviving acute hydrogen sulfide inhalation with circulatory arrest: a case report

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Introduction

- Hydrogen Sulfide (H2S) Inhalation
  - Inhibition of mitochondrial respiration similar to cyanide
  - Pulmonary irritant
  - Rapid loss of consciousness
  - Odor of rotten eggs
  - Described mortality till 58% with no survivors after cardiac arrest (1)

Case presentation

- 42 year old employee in a waste processing company
- Production system failure: tank opened too early causing loss of consciousness
- Evacuation, bystander cardiac compressions, attached AED did not deliver a shock
- Smell of rotten eggs, measurements showed H2S release >100ppm

Clinical course

At arrival of the Emergency Medical Service:

- Return of spontaneous circulation without defibrillation nor adrenaline
- Obstructive breathing wherefore intubation
- Transport to hospital

During transport and stay at the emergency department:

- Stable vital signs without need for fluids nor vasopressors
- Easy ventilation

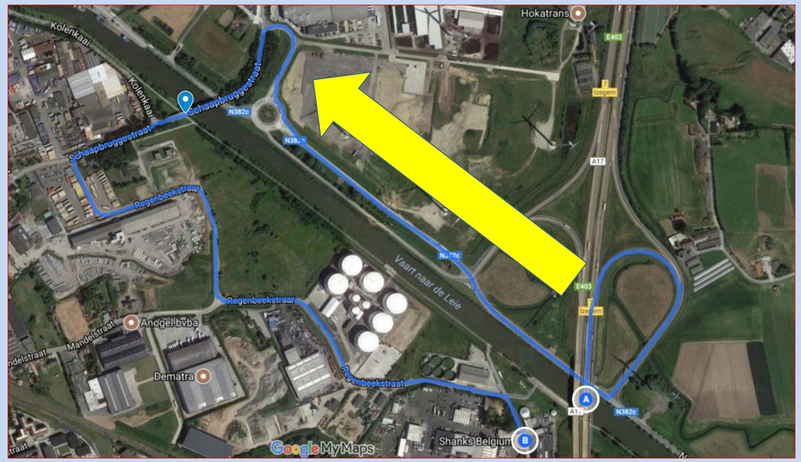

Figure 1: Location of the incident. Yellow arrow: direction of the wind. Area inside the blue circle: smell of rotten eggs.

- Blood analysis:
  - Metabolic acidosis (pH 7,02/Bicarbonate 13,5 mmol/L) with high lactate (150 mg/dL)
- Hydroxocobalamin 5 grams was given because presence of cyanide in the gas mixture could not be excluded
- Normalization of lactate 4 hours after the incident
- Extubation the next day, no sequelae besides confusion during a few days

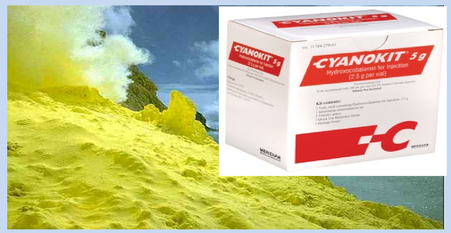

Figure 2: In most prehospital teams is hydroxocobalamin available as Cyanokit

Discussion

- Therapy in case of H2S intoxication:
  - Decontamination (removing clothes, washing) and personal protective equipment
  - Supportive therapy
  - Sodium nitrite therapy controversial: induces methaemoglobinaemia. Not given.
  - Hydroxocobalamin? Given in this case, also other positive case reports (2,3,4)

Conclusion

• Mainstay of therapy: decontamination, personal protection and supportive measures

• Hydroxocobalamin: widely available, low toxicity, positive case reports

We recommend early administration of Hydroxocobalamin in case of cardiorespiratory instability or neurologic symptoms, but further studies are needed.

References

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