

An algorithm for the recognition and treatment of fire-related cyanide exposure



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Background

- Multiple patients may present to the ED after a potential cyanide exposure
- Serum cyanide levels often result only hours to days later, and are hence of limited clinical utility
- Many patient have no or mild toxicity and do not require antidotal treatment
- Patients with severe toxicity must be treated rapidly, and often, empirically
- The current literature does not contain a single algorithm to guide the diagnosis and treatment of fire-related cyanide exposure patients across the spectrum of acuity

Hypothesis

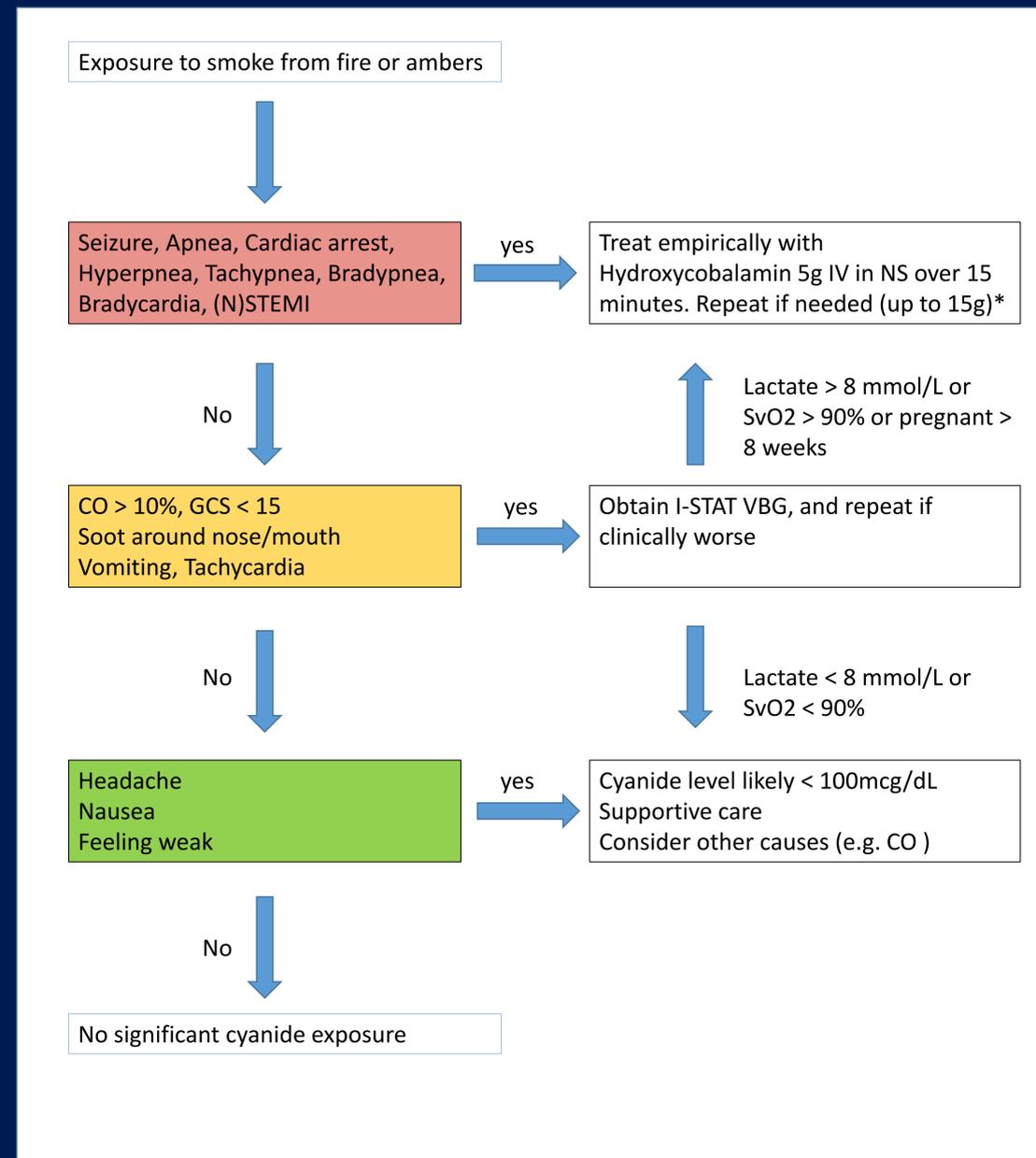
- A diagnostic algorithm can be developed for patients with inhalational cyanide toxicity

Methods

- Systematic PubMed review in 9/2013
- Case reports/series, animal studies, observational studies
- Excluded data of chronic cyanide exposure
- English and German literature

Results

- 207 abstracts and 95 studies included
- Certain clinical signs, symptoms and laboratory markers correlate with the degree of cyanide toxicity
- Long-term neurologic sequelae of acute cyanide toxicity were only observed in patients who presented with either coma or significantly abnormal vital signs



Conclusions

- We propose a diagnostic algorithm that delineates evaluation and treatment indications for patients who range from minimally symptomatic to critically ill after potential cyanide exposure via smoke inhalation
- We recommend withholding antidotal treatment from patients who display minimal or no signs of cyanide toxicity
- A treatment guideline based on clinical features and rapidly available laboratory markers may be important in the triage and management of multiple patients (eg, a nightclub fire, burning industrial complex)

Limitation

- There are no randomized controlled human trials
- Cyanide toxicity is rare, thus validation of this algorithm is challenging

Selected Citations

- Varone, C. et al. Report of the Investigation Committee into the Cyanide Poisonings of Providence Firefighters. Available from http://www.firefightercancersupport.org/wp-content/uploads/2013/06/cyanide_poisonings_of_providence_firefighters.pdf Accessed 9/28/2013
- O'Brien DJ, Walsh DW, Terriff CM, Hall AH: Empiric management of cyanide toxicity associated with smoke inhalation. *Prehosp Disaster Med* 2011;26(5):374-382

