

## Hydrogen Peroxide Exposures Reported to the Toxicology Investigators Consortium (ToxIC)

Benjamin Hatten<sup>1,2</sup>

<sup>1</sup>*Department of Emergency Medicine, University of Colorado School of Medicine, Aurora, CO, USA,*

<sup>2</sup>*Rocky Mountain Poison and Drug Center, Denver, CO, USA*

Background: High concentration peroxide ingestions have been associated with embolic events and caustic injuries in case reports. However, little has been published regarding the epidemiology of peroxide ingestions.

Research Question: To compare the epidemiology of and treatment following household and high concentration peroxide exposures.

Methods: The Toxicology Investigators Consortium (ToxIC) Registry records all clinical consults by an international network of medical toxicologists in a standardized fashion. ToxIC was queried for all cases of household (less than or equal to 10%) or high concentration (>10%) hydrogen peroxide ingestion or inhalation exposures. Household and high concentration exposures were compared with regards to demographics, associated signs and symptoms, evaluation, and treatment expressed with descriptive statistics, tests of proportions, Chi-Squared tests, and Woolf's adjusted odds ratio.

Results: 39 hydrogen peroxide exposures, 11 high concentration and 28 household, were reported to ToxIC from 2010-2016. Mean age of household exposures was 37 years vs 51 years for high concentration. In cases describing the amount ingested, the mean volume of high concentration peroxide was 52 ml. High concentration peroxide exposures were more likely to exhibit CNS toxicity (OR 15.4: 95% CI 1.5-160.8) and GI/Hepatic toxicity (OR 7.4: 95% CI 1.1-49.2). Weakness/paralysis was reported in 2/11 (18%: 95% CI 2-52%) high concentration peroxide exposures and no household exposures. 5/11 (45%: 95% CI 15-75%) of high concentration peroxide exposures reported portal venous gas on abdominal CT. 7/11 high concentration and 1/28 household exposures were treated with hyperbaric oxygen therapy (OR 47.3: 95% CI 4.5-492.3). No deaths were reported.

Discussion: Exposures contained in the ToxIC registry are limited to direct consults by a medical toxicologist and may represent a more severe spectrum of disease compared to the total population of exposures. Effectiveness of treatment and long-term outcomes aside from death are not available from upper-level ToxIC data, limiting the evaluation of hyperbaric oxygen therapy as a therapy following peroxide ingestions.

Conclusion: In cases recorded in the ToxIC registry, high concentration peroxide exposures exhibit more severe toxicity and are more frequently treated with hyperbaric oxygen compared to household concentrations.