Harmful Algal Bloom Impacts on Human Health: An Analysis of National Emergency Department Data in the U.S. from 2016 to 2018

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Introduction: Harmful algal bloom (HAB) cyanobacterial species produce cyanotoxins that disrupt ecosystems and are harmful to both human and animal health. These HAB events are increasingly common around the world and have been recorded in every continental state. HAB cyanotoxins released by cyanobacteria affect a wide range of tissues, including the skin, nervous system, liver, and lungs. We sought to determine trends and patterns in diagnostic codes relating to HAB exposures from the Healthcare Cost and Utilization Project's (HCUP) Nationwide Emergency Department Sample (NEDS).

Methods: We analyzed HCUP NEDS data from years 2016 to 2018 as these represented the years in which complete data was available using the World Health Organization (WHO) International Classification of Diseases-10 diagnosis codes for HAB exposure. For each year's grouping, statistical analysis was performed to uncover patterns and trends. Each patient occurrence was screened for the most prevalent comorbidities associated with HAB exposures.

Results: Over the 3-year period studied, there were 118 reported patient admissions to the Emergency Department. Respiratory related illness accounted for the majority of comorbidities and were present in 53% of patients, including 30% as the primary diagnostic code.

Conclusion: These data represent one of the first attempts to analyze HAB exposure related illness presenting to Emergency Departments in the United States. The predominance of respiratory related diagnostic codes in these patients suggests greater attention to these conditions in the risk characterization of HAB exposure in the development of evidence-based prevention and treatment strategies.

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