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51. Chemical Threat Agents Reported in the ToxIC Registry (2010–2013)

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Background: Since 2010, the Toxicology Investigators Consortium (ToxIC) Registry records in a standardized fashion all clinical consults seen by an international multi-center network of medical toxicologists in a standardized fashion. It holds the potential to examine the natural history of chemical threat agent poisoning.

Research Question: Does the Registry contain cases of potential threat agents?

Methods: In recent years, the Department of Defense, the Food and Drug Administration, the Department of Health and Human Services, and the Centers for Disease Control have developed lists of chemicals that are considered potential threat agents. The Registry was queried from 2010 to 2013 for cases entered with an exposure to chemical threat agents identified on these lists. Cases recorded as no or chronic exposure, no signs/symptoms, and signs/symptoms unlikely toxin-related were excluded. This list of agents included: blister agents: Lewisite, nitrogen mustard, phenol, sulfur mustard; blood agents: arsenic/arsine, boron trifluoride, brodifacoum, carbon disulfide, carbon monoxide, chlorohydrin, cyanide, diborane, ethylene oxide, fluoroacetate, hydrazines, hydrogen fluoride/ammonium bifluoride/tungsten hexafluoride, hydrogen selenide/selenous acid/selenium, hydrogen sulfide, methemoglobinemia, methylene chloride, potassium chloride, ricin, sodium azide, thallium; choking agents: acrolein, acrylonitrile, ammonia, sodium hypochlorite/calcium hypochlorite/sodium dithionite/sodium borohydride, bromine, chloramine, chlorine, formaldehyde, hydrochloric acid, hydroxides (potassium or sodium), isocyanate, nitric acid, nitrogen dioxide, sulfur trioxide/disulfuric acid/pyrosulfuric acid, phosgene, phosphine, phosphorus trichloride, perfluoroisobutylene, sulfuric acid, sulfur dioxide; nerve agents: botulism, carbamates, nicotine, organophosphates, and tetramine.

Results: Thirty-six institutions from four countries entered 711 cases: 3 blister, 446 blood, 208 choking, and 54 nerve agent. The number of cases and institutions entering a case for each high priority agent are listed in the table. Three deaths were reported: one each with brodifacoum, cyanide, and thallium.

Conclusions: No single site sees enough cases to gather sufficient data on rare and serious agents. The ToxIC Registry provides a resource to compile multiple cases and can serve as a venue for translational research and clinical trials related to chemical threats.

Table (Abstract 51)

| Agent | # of cases | # of sites |
|---------------------------|------------|------------|
| Cyanide | 35 | 14 |
| Organophosphate/Carbamate | 33 | 16 |
| Brodifacoum | 21 | 13 |
| Nicotine | 14 | 7 |
| Botulism | 7 | 6 |
| Sodium Azide | 6 | 2 |
| Thallium | 6 | 3 |
| Ricin | 3 | 3 |