



Inhalational Palytoxin Exposures Reported to the NPDS

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Background

- Palytoxin is one of the most potent toxins known with an LD₅₀ of 0.15µg/kg upon parenteral injection.
- It is produced by the microalgae *Ostreopsis* sp., and accumulates in both fish and certain species of coral.
- While death has resulted from ingestion of fish containing the poison, there are also reports of inhalational injury from breathing sea air bordering microalgae fields or cleaning an aquarium containing the coral that produces the palytoxin.



Methods

- The National Poison Data Center (NPDS) was queried for all inhalational palytoxin exposures reported to U.S. poison centers between 2005-2014.
- Data analyzed included demographic, exposure, clinical, and temporal characteristics.

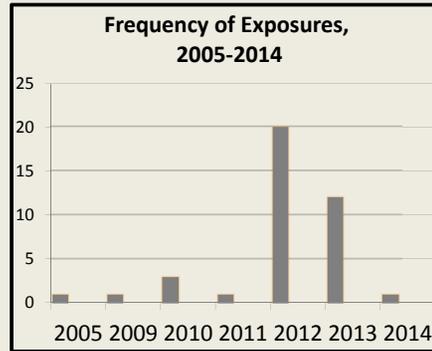


Table 1. Most Common Clinical Effects

Clinical Effect	n	%
Fever/hyperthermia	23	59.0
Cough/choke	16	41.0
Dyspnea	16	41.0
Nausea / Vomiting	7	17.9
Tachycardia	6	15.4
Bronchospasm	4	10.3
Chest Pain	2	5.1
Headache	2	5.1

Table 2. Most Common Therapies Performed

Therapies Performed	n	%
Bronchodilators	8	20.5
Fresh Air	8	20.5
IV Fluids	5	12.8
Oxygen	5	12.8
Dilute/Irrigate/Wash	4	10.3
Antibiotics	2	5.1
Antihistamines	2	5.1
Steroids	2	5.1

Results

- There were 39 cases of palytoxin exposure, of which 51% and 31% were reported in 2012 and 2013, respectively.
- Most cases were unintentional environmental (n=15, 38%) and occurred at the patient's own residence (n=30, 77%).
- The majority (n=33, 85%) of patients reported or were expected to have no more than minor or moderate effects (Table 1).
- Only one patient experienced major effects and no deaths occurred.
- Twenty-nine patients (75%) were treated at a healthcare facility while 6 patients (15%) were managed at home.
- Patients were primarily treated with bronchodilators, oxygen, intravenous fluids, and irrigation (Table 2).
- Frequencies by states are presented in Table 3. New York had the most frequent reported cases, primarily due to a single multiple exposure event.

Table 3. States with Most Number of Cases

State	n	%
New York	17	43.6
Kansas	4	10.3
New Hampshire	2	5.1
New Jersey	2	5.1
Virginia	2	5.1

The following states had only one reported exposure: California, Colorado, Georgia, Kentucky, Maryland, North Carolina, Oregon, Pennsylvania, Rhode Islands, Texas, Utah, and Washington.

Conclusion

- Palytoxin remains a rare exposure in the U.S.
- The majority of inhalational palytoxin exposures are relatively benign.
- Standard treatments include supportive care and bronchodilator therapy.
- Better education about the dangers of coral containing palytoxin as well as preventative measures may prevent further exposures.

References

1. Deeds JR, Schwartz MD. Human risk associated with Palytoxin exposure. *Toxicol.* 2010; 56: 150-162.
2. Tubaro A, Durando P, Del Favero G, Ansaldi F, Icardi G, Deeds JR, Sosa S. Case definitions for human poisonings postulated to palytoxins exposure. *Toxicol.* 2011; 57: 478-495

