

## Exposure and Effect Assessment of Aerosolized Red Tide Toxins (Brevetoxins) and Asthma

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**Background:** In previous studies we demonstrated statistically significant changes in reported symptoms for lifeguards, general beach goers, and persons with asthma, as well as statistically significant changes in pulmonary function tests (PFTs) in asthmatics, after exposure to brevetoxins in Florida red tide (*Karenia brevis* bloom) aerosols.

**Objectives:** In this study we explored the use of different methods of intensive ambient and personal air monitoring to characterize these exposures to predict self-reported health effects in our asthmatic study population.

**Methods:** We evaluated health effects in 87 subjects with asthma before and after 1 hr of exposure to Florida red tide aerosols and assessed for aerosolized brevetoxin exposure using personal and ambient samplers.

**Results:** After only 1 hr of exposure to Florida red tide aerosols containing brevetoxin concentrations  $> 57 \text{ ng/m}^3$ , asthmatics had statistically significant increases in self-reported respiratory symptoms and total symptom scores. However, we did not see the expected corresponding changes in PFT results. Significant increases in self-reported symptoms were also observed for those not using asthma medication and those living  $\geq 1$  mile from the coast.

**Conclusions:** These results provide additional evidence of health effects in asthmatics from ambient exposure to aerosols containing very low concentrations of brevetoxins, possibly at the lower threshold for inducing a biologic response (i.e., toxicity). Consistent with the literature describing self-reported symptoms as an accurate measure of asthmatic distress, our results suggest that self-reported symptoms are a valuable measure of the extent of health effects from exposure to aerosolized brevetoxins in asthmatic populations.

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