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Lobomycosis in Bottlenose Dolphins: Spatial Aggregation of an Emerging Infectious Disease

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Introduction:

We report the emergence of a rare fungal disease in Florida bottlenose dolphins in epidemic proportions. Lobomycosis is a mycotic infection of humans and dolphins caused by a yeast-like organism (*Lacazia loboi*[r]). Dolphins and humans are the only species known to be naturally susceptible to infection. Only 5 cases of human lobomycosis have been reported among residents of industrialized countries. Prior reports in dolphins consist of isolated case reports.

Methods:

We undertook a comprehensive health assessment of bottlenose dolphin (*Tursiops truncatus*) populations) at two sites in the southeastern United States: the Indian River Lagoon (IRL) along Florida's east central coast and the estuarine waters near Charleston, South Carolina (CHS). During the summer seasons of 2003, 2004 and 2005, 180 individual dolphins were captured, examined, sampled, marked and safely released at these two sites. A comprehensive examination of each dolphin was performed that included physical and ultrasound examinations, and collection of blood and other tissues for hematology and serum chemistry, tests of immune function, levels of organic and inorganic anthropogenic contaminants and other biomarkers.

Results:

The prevalence of lobomycosis among dolphins captured in the southern section of the IRL was 23.1 percent (9/39). Lobomycosis was not detected among 51 dolphins captured in the northern section of the 260 km waterway, nor among 90 dolphins sampled in CHS. Evidence from photo-identification surveys conducted in the IRL between 1996 and 2005 supports the existence of an epidemic and its unusual spatial distribution. Preliminary data show evidence of reduced immune function in some animals.

Discussion:

The reasons for the emergence of this rare infectious disease in the dolphin population of the IRL are unknown. Localization of the disease to the southern section of the IRL, characterized by freshwater intrusion suggests that exposure to environmental factors may contribute to the unusually high prevalence of the disease. Local environmental perturbations in salinity, temperature or vegetation may play a role in the spatial distribution of lobomycosis. Alternatively, perturbations in immune function, caused by exposure to pesticides, PCBs or other classes of organic contaminants may render the dolphin more susceptible to infection. Dolphins may represent a sentinel species for this emerging infectious disease.

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