

CD SUMMARY

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Current Disease Summary

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Diarrheal Outbreaks Associated with Newly Described Cyanobacteria-Like Bodies

SINCE 1986, THERE HAVE BEEN several reports of a syndrome of prolonged diarrhea, anorexia, and fatigue, associated with the presence of cyanobacteria (blue-green algae)-like bodies (CLB) in stool specimens.¹⁻³ Affected persons either were immunocompromised or had recently traveled to tropical countries. In 1989 and 1990, the first outbreaks of this syndrome occurring in immunocompetent persons were reported. This report summarizes the investigations of these outbreaks, affecting at least 150 persons, which occurred in Chicago in 1990 and in Kathmandu, Nepal, in 1989 and 1990.

Several staff physicians at a Chicago hospital developed a diarrheal illness in July 1990, typically including a one day prodrome of malaise and low-grade fever, followed by explosive diarrhea, anorexia, abdominal cramping, nausea, and occasional vomiting. Diarrhea initially lasted 3-4 days, but was followed by a cycle of relapses and remissions lasting up to 4 weeks. During remissions, patients noted ongoing malaise and anorexia, sometimes accompanied by constipation.

Stool specimens were obtained from 20 ill persons from 2 days after onset and over the next several weeks. Cultures were negative for *Salmonella*, *Shigella*, *Campylobacter*, *Yersinia*, and *Vibrio*; ova and parasites were not detected. Stool specimens from 10 patients contained CLB. By nine weeks after onset, CLB were no longer detectable. A contaminated water supply was implicated as the source of infection. A survey by area hospitals and the Illinois Public Health Lab of all stool specimens submitted from August 6 through 27 revealed CLB in two patients not involved in the hospital outbreak. The one patient who could be located had symptoms typical of CLB-associated illness.

In 1989, physicians at a Kathmandu clinic serving expatriates identified more than 50 persons over a six-month period with a syndrome of prolonged watery diarrhea, fatigue, and anorexia. CLB were identified in the stool samples of all persons. Symptoms lasted for 4 to 107 days (mean: 43 days). The duration of illness was similar in both those who received antibiotics (including norfloxacin, tinidazole, and quinacrine) and those who received no treatment. Patients ranged in age from 1 to 67 years. Five persons became ill within 2-11 days of their arrival in Nepal. No additional cases were identified from November until May 1990, when the problem resurfaced.⁴ Over the next five months, CLB were again identified in stool specimens obtained from 85 patients. Over 95% of those interviewed had watery, nonbloody diarrhea. The median duration of diarrhea was 17 days, with a median of seven stools per day at the peak of illness. Diarrhea was usually accompanied by fatigue and anorexia; the severity of symptoms varied over the course of illness. Analysis of samples of water from various sources, raw vegetables, and cow manure only detected CLB on one head of lettuce from which one patient had eaten two days before onset of illness. Analysis of 184 stool samples submitted by Nepali citizens to local hospitals at the end of the outbreak period detected CLB in six (3%).

Cyanobacteria are a diverse collection of primitive unicellular to multicellular photosynthetic bacteria usually found in water or very moist environments.⁵ In rich environments, some species may grow without light.⁶ CLB are so named because they possess some morphologic and reproductive characteristics similar to those of the order Chroococcales of cyanobacteria.⁷ However, CLB do not have all of the characteristics of any known cyanobacteria type, and their exact taxonomic position is unclear.⁷

CLB may be a new human diarrheal pathogen, capable of causing prolonged diarrheal illness in both immunocompromised and immunocompetent persons. Since 1986, the organism has been identified in the stools of patients who have lived in or visited the United States, the Caribbean islands, Central and South America, Southeast Asia, and Eastern Europe.⁷ The CLB-associated clinical syndrome reported in these three outbreaks (acute onset of intermittent, prolonged, watery diarrhea, accompanied by anorexia) is similar to that described in previous, individual case reports.¹⁻³ The onset of these outbreaks in both Chicago and Nepal coincided with the arrival of warmer temperatures, suggesting the possibility of a seasonal factor in its appearance.

CLB can be visualized in wet mounts of fresh, unpreserved stool by light microscopy as nonrefractile, hyaline cysts. They are refractory to most commonly used stains, but may stain deep mottled red or pink with the modified acid-fast stain. Under UV light, CLB autofluoresce strongly, appearing as bright blue circles.

Investigations are in progress to determine the extent to which CLB in stool specimens are associated with illness, and to determine possible modes of transmission, reservoirs, and other characteristics of the organism. CLB should be considered when assessing patients with unexplained prolonged diarrheal illness. The Health Division would appreciate hearing of any suspected cases of CLB-associated disease in Oregon, or any clusters of unexplained diarrheal illness. In the event of suspected outbreaks, we can arrange for laboratory and epidemiological support.

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Rabies in Oregon: an Update

PANCHO, AN UNVACCINATED PEKINESE DOG, was bitten several times by other dogs while vacationing in Mexico for six weeks (with its owners). The dog developed clinical signs of rabies shortly after the owners drove back into the U.S. in early February 1991. Border inspectors apparently failed to notice the dog sitting in the front seat. Several persons were bitten during the course of the automobile trip back to Oregon. That was the end of the road for the increasingly agitated Pancho; his brain tissue "lit up like a Christmas tree" when tested by rabies IFA at the state lab. As a result of investigation by Douglas County sanitarians, three persons who had been bitten received anti-rabies prophylaxis, and three dogs that had contact with Pancho were euthanized.

In 1990, a total of 167 animals were examined for rabies at the Public Health Laboratory, or at the Veterinary Diagnostics Laboratory at Oregon State University. Only one animal, a bat (from Marion County), was positive. This bat had flown into an open window and bitten a sleeping child. She was prophylaxed with rabies immune globulin and vaccine. The table shows the results of rabies exams at state labs from 1981-1990. Only two rabid terrestrial animals were identified in this decade—a cat in 1984, and a fox in 1981. Rabid cats and foxes had been previously identified in 1963 and 1966, respectively. Both cats and foxes can be bat predators. A Umatilla County skunk tested positive in 1965 (the only rabid terrestrial animal from eastern Oregon since 1960). The most recent well-diagnosed dog was in 1967. Since 1960, when a good diagnostic test came into use, no other rabid wild or domestic species native to Oregon have been identified.

In Oregon, endemic rabies is limited to bats. Any bat biting a person should be assumed to be rabid unless proven otherwise by examination. Rarely, there is spillover from infected bats to other mammals in Oregon. Of more concern is the occasional importation of rabid animals, including pets, from areas where rabies is established in terrestrial animals (e.g. California or Mexico). Human bites by a possibly rabid animal should be reported by the next working day to the local health department. A prompt investigation by persons knowledgeable about animal behavior and the ecology of rabies in Oregon can provide guidance for the physician managing these patients. At night or over the weekend, expert consultation is available from the Health Division (229-5599).

Rabies Examinations in Oregon, 1981-1990

Year	Dogs, Cats	Bats	Wild Animals	Other Animals	Total Tested	Positives
1990	101	33	14	19	167	1 bat
1989	108	55	27	27	217	5 bats
1988	137	53	37	17	244	6 bats
1987	127	66	14	44	251	5 bats
1986	125	61	21	53	260	5 bats
1985	113	110	18	52	293	6 bats
1984	161	71	29	30	291	1 cat, 6 bats
1983	153	73	25	42	290	3 bats
1982	129	76	24	29	258	4 bats
1981	150	78	25	40	293	1 fox, 11 bats
totals	1304	676	234	353	2564	54 positives

References for CLB-associated Diarrhea

1. Soave R, Dubey JP, Ramos LJ, Tummings M. A new intestinal pathogen? (Abstract). Clin Res 1986;34:533A.
2. Hart AS, et al. Novel organism associated with diarrhoea in AIDS. Lancet 1990;335:169-70.
3. Long EG, et al. Alga associated with diarrhea in patients with acquired immunodeficiency syndrome and in travelers. J Clin Micro 1990;28:1101-4.
4. Shlim DR, et al. An algae-like intestinal organism associated with an outbreak of prolonged diarrhea among foreigners in Nepal. Am J Trop Med Hyg (in press).
5. Staley JT, et al., eds. Bergey's manual of systematic bacteriology. Vol 3. Baltimore: Williams and Wilkins, 1989:1710-806.
6. Humm HJ, Wicks SR. Introduction and guide to the marine blue-green algae. 1st ed. Berkeley, California: University of California Press, 1990.
7. Long EG, et al. Morphological and staining characteristics of a Cyanobacterium-like organism associated with diarrhea. J Infect Dis (in press).