

Cercarial Dermatitis (Swimmers' Itch): A Primer

By Albert C. Gray, Environmental Manager, Hernando County Health Department, and
Zuber D. Mulla, Bureau of Epidemiology

Cercarial dermatitis or "swimmers' itch" is a short-term, cutaneous inflammatory response associated with the penetration of the skin by cercariae, the free-swimming larval stage of nonhuman schistosomes [1, 2]. These parasitic flatworms are released from infected snails that inhabit water used for swimming and other recreational activities [3]. Humans are accidental dead-end hosts and the disease is neither communicable nor fatal, still it is not without economic and epidemiologic importance [1]. Cercarial dermatitis should also be clearly differentiated from human schistosomiasis, a serious systemic infection affecting 200-300 million people worldwide.

Schistosomes are blood flukes with two-host life cycles. The vertebrate definitive host in North America is typically a bird, but may be a rodent or deer [4-6]. The intermediate snail hosts have been identified in the Great Lakes region of the U.S. as members of the genus *Lymnaea* and genus *Physa* [1]. Typically, the adult fluke grows and copulates in the portal vessels of the definitive hosts. The female migrates to the intestinal wall, where she lays her eggs. These then penetrate the wall and are excreted in the feces into the water. Each egg contains a larval form called a miracidium. These hatch and enter a snail, which approximately five weeks later produces hundreds of free-swimming colorless cercariae about 0.7 mm long [1]. The cercariae seek a warm-blooded host and die within 12-24 hours if unsuccessful. They can attach to the human skin and penetrate it, but go no further. The organisms die just beneath the epidermis leaving protein to elicit a hypersensitivity response.

Clinical manifestations begin with a prickling sensation after swimming in infested waters [1-3]. This lasts for about one hour and is accompanied by erythematous macules at each site of penetration sometimes accompanied by diffuse erythema or urticaria. After a period of 10 to 15 hours, a papular, intensely pruritic eruption appears. Vesicles or pustules may form as a result of secondary infection caused by scratching. The lesions begin to resolve within 5 to 7 days, with complete healing within two weeks. The dermatologic response is variable; repeated exposure increases an individual's sensitivity to the parasite and increases the likelihood of rash development [3, 7]. Antihistamines or corticosteroid creams can be applied to the skin and antibiotics may be indicated if bacterial infection develops.

Cercarial dermatitis occurs worldwide both in freshwater and marine settings [2], and may interfere with the economic and recreational use of an aquatic setting [1]. The disease was first identified in the U. S. in Michigan by Cort in 1928 [7]. Subsequently, it has been reported primarily in the Great Lakes region, but also in Iowa, the Dakotas, Nebraska, New York, the Pacific Northwest, and Delaware [1-3]. Since, cercarial dermatitis is not a notifiable disease in Florida, there have been no documented cases in the state. However, typical schistosome lesions have been observed on individuals swimming in the Crystal and Homosassa Rivers (Citrus County) and Weeki Wachee River (Hernando County) during the spring and summer months [8]. Further investigation in Florida is necessary to verify its occurrence, and determine the public health and economic impact of the disease.

References

1. Hoeffler, D.F.: *Cercarial dermatitis, its etiology, epidemiology, and clinical aspects.*, Arch. Environ. Health, 29: 225, 1974.
2. Centers for Disease Control. *Cercarial dermatitis outbreak at a state park - Delaware, 1991.* MMWR 41(14):225-228, April 10, 1992.
3. New York State Department of Health. *Swimmers' itch* (communicable disease fact sheet). Internet address: www.health.state.ny.us/nysdoh/consumer/swim.htm
4. Cort W.W.: *Studies on schistosome dermatitis: XI. Status of knowledge after more than 20 years.* Am J Hyg 52:251-307, 1950.
5. Malek E.A.: *The biology of mammalian and bird schistosomes.* Bull Tulane Univ Med Faculty 20:181-207, 1961.
6. Clampitt P.T.: *The biology of swimmer's itch.* The Explorer 14:17-31, 1972.
7. Cort W.W.: *Schistosome dermatitis in the United States (Michigan)* JAMA 90:1027-29, 1928.
8. Bradley, C. and Gray, A.: Dept. of Health, Personal Communication