

Rewards (and risks) of Bleach Baths

Leonard M. Milstone, MD (Yale University)
Peter M. Elias, MD (UC San Francisco)

Why do dermatologists recommend bleach baths to many of their patients with ichthyosis? Laundry bleach is quite caustic with a pH of 11. Dilute bleach (sodium hypochlorite: 1 part in 99 parts of tap water) is a potent, rapid antiseptic that has a slightly alkaline pH of 9. These two facts govern the appropriate use of bleach baths by our patients.

Many patients with ichthyosis, despite their best attempts at personal hygiene, become colonized by an overgrowth of bacteria, yeasts, or fungi. An unfortunate consequence of this colonization by these microbes can be an unpleasant odor. When these same microbes try to reside on normal skin, they encounter a much thinner, and much more acidic stratum corneum. The 'acid mantle' of normal skin (pH 5.0 - 5.5) resists the growth of many microbes, while selectively encouraging colonization by the microbes that normally occupy the niche of the stratum corneum. In contrast to the low pH of normal skin, the pH of ichthyotic stratum corneum rises (to pH 6-7) due in part to excess scale, inflammation, and a defective barrier. This elevated pH and the thickened stratum corneum niche favor the overgrowth of many microbes, including not only those that populate normal stratum corneum, but also pathogenic microbes, such as *Staphylococcus aureus*. Clearly, the chief reason we recommend bleach baths is their ability to reduce the amount of odoriferous colonization by potentially pathogenic microbes on the skin surface.

There is a second consequence of the elevated pH of ichthyotic skin, and the even more elevated pH of bleach. There are enzymes in the stratum corneum that are more active at an elevated pH, and whose activity can have two important consequences. First, some of these enzymes degrade the connections that hold the cells of the stratum corneum together, causing these cells to separate from each other, and eventually to be shed from the skin surface. Obviously, for someone who has too thick a stratum corneum, bleach baths could prove to be an advantage. It should be noted, however, that there are no experimental or clinical data proving that bleach promotes desquamation. Second, some of the enzymes that are more active at higher pH can provoke inflammation, because they activate and release pro-inflammatory cytokines, proteins that normally are stored inside stratum corneum cells and shed harmlessly. Currently, there are no studies that address whether the slightly alkaline pH of bleach baths increases inflammation in those who have inflamed skin. Somewhat surprisingly, there is one study showing that dilute bleach has the ability to reduce inflammation in an animal model of inflamed (not ichthyotic) skin. So in sum, we still have questions about the impact that bleach baths have on inflammation in our patients.

Most of us would agree that, taken together, the benefits of bleach baths in reducing microbial overgrowth, odor and infections far outweigh the uncertainties arising from its slightly alkaline pH. Yet none of us would see any advantage to prolonged exposure to the abnormally high pH of dilute bleach baths for patients with ichthyosis. Instead, it would seem prudent to follow one's bleach bath with a generous application of a slightly acidic emollient, such as Amlactin or Lac Hydrin, to help restore the skin's natural acid mantle.

This information is provided as a service to patients and parents of patients who have ichthyosis. It is not intended to supplement appropriate medical care, but instead to complement that care with guidance in practical issues facing patients and parents. Neither FIRST, its Board of Directors, Medical & Scientific Advisory Board, Board of Medical Editors, nor Foundation staff and officials endorse any treatments or products reported here. All issues pertaining to the care of patients with ichthyosis should be discussed with a dermatologist experienced in the treatment of their skin disorder.



Foundation for
Ichthyosis & Related
Skin Types

PO Box 1067, Lansdale, PA 19446-0687
Phone: 800-545-3286
Website: www.firstskinfoundation.org
Email: info@firstskinfoundation.org

Improve lives and seek cures for those affected by ichthyosis and related skin types.

January 2021