Evaluation of Epsom salt bath as a potential anti-staphylococcal adjunctive treatment in atopic dermatitis

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Atopic dermatitis (AD) is a chronic inflammatory condition of the skin associated with *Staphylococcus aureus* colonization. Dilute bleach baths are commonly used in the treatment of AD but are not able to directly kill or inhibit the growth of *S. aureus*. In this study we examined if the use of another common bath additive (Epsom salt; MgSO4) could have potential as an anti-Staphylococcal adjunctive treatment in AD. *S. aureus* and four other Staphylococcal species were bathed in various Epsom salt (ES) concentrations ranging from 2 cups ES in 40 gallons of water (online recommendation) to 2 cups ES in 4 cups of water for 20 minutes, and then bacterial survival was assessed via overnight growth in nutrient-rich media. Overnight growth occurred for all Staphylococcal species at the concentration of 2 cups ES in 40 gallons of water. However, *S. aureus* did not grow overnight after 20-minute bath in a high concentration solution of 0.36 g ES/mL water (1.5 cups ES in 4 cups of water) compared to water control (*p < 0.001*). At this concentration of Epsom salt bath, overnight growth did occur in the commensal *S. epidermidis* (*p = 0.018*) compared to negative control while overnight growth of the commensal species *S. capitis*, *S. warneri*, and *S. lugdunensis* did not occur compared to water control (*p < 0.001*). Taken together, a concentrated 20-min Epsom salt application may show promise as a potential adjunctive treatment for inhibition of *S. aureus* in AD. Further studies exploring the effects of ES application in subjects with AD are necessary to assess the safety, specificity and efficacy of this potential simple home treatment.