Role of Microorganisms in Atopic Dermatitis

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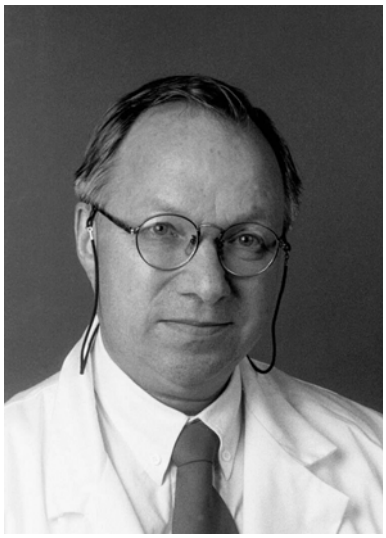

Staphylococcus aureus is a common pathogen that may colonize normal skin, but it is not a member of the normal skin flora. In healthy individuals it is most commonly isolated from the nose, the groin and perineum. Patients with atopic dermatitis (AD) are colonized with *S. aureus* both in eczematous skin as well as in normal skin. However, the density is higher in lesional skin compared to normal skin. The distinction between colonization and infection is many times difficult. Acute infections, such as impetigo and secondary infection of AD are relatively straight-forward management problems. An acute flare of AD is frequently complicated by bacterial infection. However, an acute infection is itself a well recognized cause of an acute exacerbation of AD.

There are now several papers clearly demonstrating that *S. aureus* colonize both lesional and normal skin in 70 to 100% of patients with AD. The reason for the increased colonization with *S. aureus* on the skin of patients with AD is largely unclear. The cell membrane of *S. aureus* is composed of peptidoglycan, ribitol teichoic acids and protein A. It produces coagulase and α-, β- and γ-hemolysins. *S. aureus* probably produces disease as a result of the activity of a variety of enzymes and toxic products such as haemolysins or coagulase. In skin it is known that teichoic acid and protein A can produce inflammation.

Specific *S. aureus* IgE has been found in several patients but their presence do not correlate with disease severity. However, superantigen producing *S. aureus* may trigger flares in AD. Capsular material from *S. aureus* can also result in the release of cytokines through a specific binding to immuncompetent cells. Protein A from *S. aureus* can release histamine from mast cells and basophils. Staphylococcal exotoxin can also release histamine from basophils in patients with AD, so the scope for inflammation as a result of a staphylococcal reaction is great.

In acute secondary bacterial infection of AD the oral active penicilase-resistant penicillins such as flucloxacillin or dicloxacillin are the drugs of choice. The cephalosporins such as cephadroxil and clindamycin are also effective. In patients with less severe and/or extensive signs of secondary bacterial infection topical applied antibiotics have a documented effect. However, the increase in multiresistant *S. aureus*, including resistance to fucidic acid and mupircocin, is an increasing problem.

The Malassezia yeasts are members of the normal skin flora in adults but they are also involved in several skin diseases. They can now be divided into 6 lipophilic species and one non-lipophilic species. *M. globosa*, *M. obtuse* and *M. sympodialis* are the species most commonly found in AD. The majority of adult patients with AD localised to the head and neck area are skin prick test positive to a Malassezia extract and/or have specific IgE serum antibodies. Several patients are also positive in atopic patch test with a Malassezia extract or recombinant antigens. There are conflicting reports about positive Malassezia cultures and specific immune reactions to these yeasts. The numbers of yeasts are often higher in normal skin compared to lesional skin. However, the presence and not the number of yeasts are important for develop-ment of the immune response. There is also a cross reaction between the various Malassezia species in the immune response found in patients with AD and an extract with a mixture of several species may be the best for detecting Malassezia allergy in AD.

Oral antifungal therapy has improved patients with AD. However, we need prolonged, monotherapy and controlled studies with high numbers of patients and with both oral and topical antifungal therapy to really answer the question about the importance of Malassezia in AD.

For further reading I recommend the following 3 papers dealing with the role of *S. aureus* in AD and another paper dealing with the role of fungi in AD.

Further reading

Roll A, Cozzio A, Fischer B, Schmid-Grendelmeier. Microbial colonization and atopic dermatitis. Curr Opin Allergy Clin Immunol 2004; 4: 373–378.

Hoeger PH. Antimicrobial susceptibility of skin-colonizing S. aureus strains in children with atopic dermatitis. Pediatr Allergy Immunol 2004; 15: 474–477.

Ripple F, Schreiner V, Doering T, Maibach HI. Stratum corneum pH in atopic dermatitis: impact on skin barrier function and colonization with Staphylococcus aureus. Am J Clin Dermatol 2004; 5: 217–223.

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Tobias Gedde-Dahl Jr. Receives Royal Recognition

Tobias Gedde-Dahl Jr., the dermato-geneticist, was recently awarded the Norwegian King's Order of Merit for his work for patients with epidermolysis bullosa (EB) and other genetic skin disorders.

Tobias Gedde-Dahl Jr. was born in 1934. He graduated from the University of Oslo in 1958, finished his doctoral thesis on EB in 1970 and became a specialist in medical genetics in 1971. He was a resident in dermatology at Rikshospitalet, Oslo, in 1969–70 and worked as a researcher at The Norwegian Radium Hospital from 1970 until 1986, when he became Chairman and Professor at the Department of Medical Genetics at the University of Tromsø. From 1990 until his recent retirement he held dual positions as senior researcher at Department of Dermatology, Rikshospitalet, and Institute of Forensic Medicine, University of Oslo.

Tobias Gedde-Dahl Jr.'s prime research interest has been geno-dermatoses, especially EB, on which he is recognised as world authority. As member of an extensive network of dermato-geneticists around the world, Gedde-Dahl has researched intensively for many years and written and co-written numerous papers and text book chapters.

Tobias Gedde-Dahl Jr. has a genuine interest in the well-being of his patients, most of whom suffer from rare and serious genetic skin disorders. His knowledge of their pedigrees is often astonishing, and his expert comments on their clinical and genetic diagnoses are always impressive.

In recognition of his important contributions to Norwegian dermatology, Tobias Gedde-Dahl Jr. has been made an honorary member of The Norwegian Society of Dermatology. Even more prestigiously, he was recently awarded the Norwegian King's Order of Merit.

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