

Characteristics of *Staphylococcus aureus* isolated from the skin and nostrils of children with atopic dermatitis

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Atopic dermatitis (AD) is a chronic inflammatory disease which mainly affects pediatric patients, who are highly colonized by *Staphylococcus aureus*, a pathogen of medical importance. In general, methicillin-resistant *S. aureus* (MRSA) encodes the *mecA* gene, which confers resistance to β -lactams, a class of antimicrobials often used for treatment of staphylococcal infections. The usual treatment for AD aims to mitigate the manifestations of the disease and the frequent infections due to loss of integrity of the epithelial barrier. Therefore, the objective of this study was to characterize *S. aureus* isolated from the skin and nostrils of 30 children with AD aged between two and ten years. The study was approved by an Ethics Committee with the number 55087616.0.0000.5264. Three swabs were collected: one from skin with a lesion typical of the disease, one from skin without any injury and one from the nostrils. They were inoculated into mannitol salt agar (MSA), and the bacterial species was determined using MALDI-TOF-MS and PCR. *S. aureus* isolates from lesional skin and nostrils were evaluated for antimicrobial susceptibility by disk-diffusion and presence of the gene *mecA* through PCR. The colonization profile by *S. aureus* was: 29 (96.6%) children colonized in the nostrils, 30 (100%) in lesional skin and 24 (82.75%) in skin with no lesion. All the 62 *S. aureus* isolates from lesional skin and nostrils were sensitive to mupirocin and clindamycin, while, for sulfamethoxazole-trimethoprim, two isolates presented an intermediate resistance. Fifteen isolates (eight from lesional skin and seven from nostrils), colonizing seven (23.3%) children with moderate or severe AD, were MRSA (resistant to cefoxitin and presented the *mecA* gene). In conclusion, the patients with AD presented a high prevalence of colonization by *S. aureus*, which might exacerbate the inflammatory condition and result in a decreased biodiversity in the commensal microbiota. Moreover, in this study, a high number of children colonized by MRSA was observed. The prevalence of MRSA in AD is associated with an increased severity of the disease, which drives the vicious cycle of AD. Therefore, due to the increase in MRSA strains strategies aimed at understanding more about the dissemination and epidemiology of MRSA strains are necessary, highlighting the importance of continuous and preventive surveillance in this population.

Keywords: atopic dermatitis, *Staphylococcus aureus*, methicillin resistance

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