

TITLE: Children with atopic dermatitis highly colonized with methicillin-resistant *Staphylococcus aureus* attending at a reference dermatology clinic in Rio de Janeiro

AUTHORS: Guimarães, L.C.¹; Assunção, M.I.M.M.¹; Ferreira, D.C.²; Saintive, S.³; Abad, E.D.³; Santos, K.R.N.^{1*}

INSTITUTION: ¹ Laboratório de Infecção Hospitalar, Departamento de Microbiologia Médica, Instituto de Microbiologia Paulo de Góes, Universidade Federal do Rio de Janeiro; ² Universidade do Estado do Rio de Janeiro; ³ Ambulatório de Dermatologia do Instituto de Pediatria Martagão Gesteira, Universidade Federal do Rio de Janeiro

ABSTRACT:

Atopic dermatitis (AD) is an inflammatory condition that affects mostly children. It is well known that individuals with this condition are highly colonized by *S. aureus*, a notorious pathogen. Nonetheless, little is known about methicillin-resistant *S. aureus* (MRSA) isolates colonizing Brazilian patients with AD. Therefore, this study evaluated *S. aureus* isolates from the nares and skin (with and without lesion) of 30 AD children and 12 siblings of AD children without the disease attending at a reference dermatology clinic in Rio de Janeiro, Brazil. Skin and nasal swabs were seeded on mannitol salt agar. Mannitol fermenting (MSA+) colonies (possibly *S. aureus*) were selected and those from skin were quantified. The isolates were identified by MALDI-TOF-MS and PCR, and the genes for Panton-Valentine leukocidin (PVL) were detected by PCR. Antimicrobial susceptibility was determined by disk-diffusion agar and the SCCmec type was assessed through multiplex-PCR for MRSA isolates. The number of MSA+ colonies was higher in the lesional skin than in the non-lesional skin ($P=0.03$). All the AD children were colonized by *S. aureus* in at least one site (97% in the nares, 100% in skin with lesion and 85% in skin without lesion), while 67% of non-AD children were colonized in the nares ($P= 0.02$) and 50% in the skin ($P<0.001$). Even though most of the 97 *S. aureus* isolates from the children (83 from the AD and 14 from the non-AD group) were sensitive to clindamycin, mupirocin, and sulfamethoxazole-trimethoprim, 30% of the AD children and 8% of the non-AD children presented MRSA isolates ($P= 0.23$). All the MRSA isolates carried the SCCmec type IV. Moreover, 30% of the AD-children and 25% of the non-AD group presented *S. aureus* isolates carrying the PVL genes. Among the 19 isolates PVL genes-positive in the AD group, eight (42%) were MRSA. In conclusion, there is a high prevalence of *S. aureus* isolates colonizing AD children, as well as PVL genes-positive and MRSA isolates. Therefore, the medical community should be aware of possible treatment failure when using beta-lactam antibiotics for *S. aureus* infections, which are recurrent in AD patients.

Keywords: atopic dermatitis; *Staphylococcus aureus*; methicillin resistance; Panton-Valentine leukocidin

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