

TITLE: MOLECULAR EPIDEMIOLOGICAL CHARACTERISTICS OF VIRULENCE FACTORS ON *Staphylococcus aureus* ISOLATED FROM HOSPITALS PROFESSIONALS BY MULTIPLEX-PCR

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ABSTRACT

Staphylococcus aureus is a colonizer of the upper respiratory tract, skin and mucous membranes and this colonization is considered a risk factor for infection development, mainly in immunosuppressed. Virulence factor-bearing strains such as surface proteins (adhesion), toxins and enzymes have more successful infection, and health care workers (HCW) are more likely to come in contact with virulent strains and spread them in health institutions, causing healthcare-associated infections (HAIs). This study aimed to identify molecular markers of virulence in *S. aureus* isolated from professionals of public hospitals of Maceió/Alagoas. Nasal, oral and hands swabs samples from professionals of Professor Alberto Antunes University Hospital (HUPAA) and State General Hospital (HGE) were processed at the Clinical Microbiology Laboratory (LMC/UFAL) for *S. aureus* screening in salt mannitol agar and by catalase and DNase tests. Resistance profile was evaluated by disc-diffusion and two multiplex-Polymerase Chain Reactions (mPCR) were performed, focusing encoding-genes for 4 surface proteins (*fnbB*, *fib*, *clfA* and *clfB*) and 2 secreted toxins (*hlg* and *lukED*). Out of 125 professionals, we collected 375 samples, 38 positive for *S. aureus* (10.13%), and 36 were recovered for mPCR. We confirmed virulence markers in 97,2%: 33 strains were *clfA*+ (91.7%), 31 *lukED*+ (86.1%), 30 *clfB*+ (83.3%), 19 *fib*+ (52.8%), 5 *hlg*+ (13.9%) and 4 *fnbB*+ (11.1%). All professional categories were colonized by virulent strains (1 – 6 genes) and all the genes were identified in at least one isolate from physicians, nurses and physiotherapists, with greater colonization in the medical team. However, 4 administrative workers and hospital maids were *fnbB*-negative and the most virulent strains came from a physiotherapist (+6 genes). Eight multidrug-resistance isolates (MDR) had >2 genes and 3 methicillin-resistant *S. aureus* from HGE-workers presented the same virulence pattern (+ for *lukED*, *fib*, *clfA* and *clfB*), suggestive of clonality. HCW inserted in the routine of 2 major hospitals of Alagoas were carriers of virulent *S. aureus*, with a wide distribution of clumping factor A (*clfA*), involved in cell-to-cell aggregation. The in-hospital spread of strains with a better ability to cause infections are a great risk for patients, requiring attention from each HAIs control committees to avoid patient exposure by colonized workers, and to encourage the compliance with hygiene and a strict disinfection routine.

Keywords: *Staphylococcus aureus*, virulence, MRSA, Multiplex-PCR