TITLE: *Staphylococcus aureus* AND *Pseudomonas aeruginosa* IN CHRONIC WOUNDS TREATED WITH EPIDERMAL GROWTH FACTOR AND PLATELET-RICH PLASMA

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Abstract

Chronic wounds are a challenge for patients, professionals and health care system. Depending on the injury, ulcers can cause difficulties on mobility and absenteeism to work and social activities. Bacterial colonization is frequent on these wounds and, most of the time, can delay wound healing. Identification of species present in the wound is of great importance to favor the process of tissue repair, allowing for appropriate and specific treatment according to the susceptibility of the microorganism found. The objective of this study was to evaluate the presence of *Staphylococcus aureus* and *Pseudomonas aeruginosa* colonization in wounds treated with recombinant epidermal growth factor (EGF) and platelet-rich plasma (PRP), and the presence of virulence genes on isolated strains. Experimental analysis was performed using clinical specimens collected with swabs from patients treated with PRP and EGF in the outpatient clinic of a university hospital. Swabs were then transferred to sterile saline, vortexed, and the resulting suspension was used to inoculate selective media for *S. aureus* (mannitol salt agar) or *P. aeruginosa* (cetrimide agar). After 24 hours of incubation at 37 ºC, colonies were selected for species identification by MALDI-TOF or PCR using 16S primers. In addition, presence of *exoU* and *exoS* gene for *P. aeruginosa* and *luk-PV* for *S. aureus* was evaluated by PCR. Forty-three isolates were obtained from 31 patients, 41.9% (13/31) of whom had been treated with EGF and 58.0% (18/31) with PRP. Ten of the 43 isolates were identified as *S. aureus*: 60.0% (6/10) of which were isolated from PRP-treated wounds and 40.0% (4/10), were isolated from EGF-treated wounds. Among the 33 *P. aeruginosa* isolates, 66.6% (22/33) were isolated from PRP-treated wounds and 33.3% (11/33) were isolated from EGF-treated wounds. Virulence gene analysis showed that, among the 22 *P. aeruginosa* identified in the PRP group, 15 (68.2%) strains were positive for *exoU* and one (4.5%) for *exoS*. In the EGF group, among the 11 *P. aeruginosa* strains, 4 (36,4%) were positive for *exoU* and 4 (36,4%) were positive for *exoS*. None of the *S. aureus* strains isolated on this study harbored *luk-PV*. We conclude that wounds treated with protein products are more commonly colonized by *P. aeruginosa* than by *S. aureus* and that *exoU* gene is more prevalent in *P. aeruginosa* than *exoS* gene.

Keywords: *Staphylococcus aureus*; *Pseudomonas aeruginosa;* Platelet-Rich Plasma; Epidermal Growth Factor; Chronic wounds.

Development Agencies: CAPES, FAPERJ, CNPq.