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Abstract

Variability in Antibiotic Resistance of Persistent and Intermittent *Staphylococcus aureus* Strains †

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Abstract: Introduction: Approximately 30% of the population is colonized with *Staphylococcus aureus* on the skin, mucous membranes, and in the anterior part of the nose. Two types of carriers have been described, intermittent carriers and persistent carriers, in addition to non-carriers. In persistent carriers, the same strain of *S. aureus* can and often does persist for months or even years, indicating that the species has developed special mechanisms to persist in this environment, in addition to being a multifactorial process involving genetic aspects of the host, virulence factors of the pathogen and the possible interactions between the microbiota, the host and *S. aureus*. The objective of this work was to investigate changes in the pattern of resistance to antibiotics in persistent and intermittent *S. aureus* strains. Methods. Pharyngeal and nasal exudates were performed on 98 university students once a month for three months. The exudates were incubated in Tripticasein Soy Broth at 37 °C for 24 h, followed by seeding in Salt and Mannitol Agar Petri dishes using the cross streak method and re-seeding to obtain isolated colonies. All strains that were coagulase-positive mannitol fermenters were identified as *S. aureus*. If a person presented three isolates of *S. aureus*, they were considered persistent carriers, if they presented one or two isolates in a row, they were considered intermittent carriers, and if the bacteria were never isolated, they were considered non-carriers. All strains of *S. aureus* underwent antibiogram against: ciprofloxacin, fosfomycin, trimethoprim-sulfamethoxazole, penicillin, vancomycin, tetracycline, erythromycin, oxacillin, clindamycin, gentamicin and cafalothin by the Kirby-Bauer method and minimum inhibitory concentration for oxacillin, following the indications of the CLSI. Results. We analyzed 61 women (62.2%) and 37 men (37.7%) with a mean age of 21.1 (±5.7) years, of which 18 were persistent carriers in both anatomical sites (18.3%), 19 persistent carriers exclusively in the pharynx (19.3%), no persistent carriers exclusive to the nose were found. 27 were intermittent carriers in the nose (28.5%) and 34 are intermittent carriers in the pharynx (34.7%). For persistent strains, an average of 80% (±21.6) resistance was found for penicillin, 14% (±25.3) for fosfomycin, 14% (±24.7) for trimethoprim-sulfamethoxazole, 12% (±4.6) for clindamycin, 7 % (±2.6) for erythromycin, 4% (±2.2) for tetracycline, 2.7% (±3.6) for vancomycin, the other antibiotics (ciprofloxacin, oxacillin, gentamicin and cephalothin, less than 1% of resistant strains were found). Regarding the intermittent strains, it was found that 74% (±15) are resistant to penicillin, 14% (±10.9) are resistant to erythromycin, 17% (±7) to clindamycin, 10% (±6.4) to oxacillin, 10% (±11.4) are resistant to trimethoprim-sulfamethoxazole, 8.6% (±9.2) are resistant to tetracycline, 6% (±11.22) to fosfomycin, the antibiotics ciprofloxacin, vancomycin, gentamicin and cephalothin presented resistance in less than 1% of *S. aureus* strains. Discussion. The average resistance to antibiotics of the persistent and intermittent *S. aureus* strains are very similar, however, the variation in resistance between doses does present more variation between the intermittent strains, particularly in trimethoprim-sulfamethoxazole and oxacillin antibiotics. Conclusions. More persistent carriers

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of *S. aureus* were found in the pharynx and nose than intermittent carriers in one or both sites. The variation in the percentage of resistance to an antibiotic was found to be more important in the intermittent strains than in the persistent ones.