

Analysis of multiresistance to antibiotics of MRSA strains isolated from the pharynx and nose in a Mexican population.

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Introduction. *Staphylococcus aureus* is a spherically clustered Gram-positive bacterium pathogenic to humans and animals. Normally, *S. aureus* can be isolated from healthy individuals from the nose, pharynx and skin, although it is rare for it to cause infections in healthy skin, however, upon entering tissues or the bloodstream, it can cause serious diseases, in this regard, *S. aureus* is one of the main reasons for the spread of hospital and community infections. Methicillin-resistant *S. aureus* (MRSA) strains were first observed among clinical isolates from hospitalized patients in the 1960s, but since the 1990s they have spread rapidly in the community. The objective of this work is to study the resistance to antibiotics of MRSA strains isolated from the Mexican population.

Methods. Pharyngeal and nasal swabs were performed in 1777 apparently healthy people from the Mexican population from 1999 to 2011 with a mean age of 22.91 years (± 16.9). The exudates were inoculated on Salt and mannitol agar until isolates were obtained. Mannitol and coagulase-positive fermenting strains were considered as *S. aureus*. The minimum inhibitory concentration (MIC) test for oxacillin was performed on these strains, and they were considered as MRSA to those strains that grew in concentrations $\geq 4 \mu\text{g}/\mu\text{L}$. Antibiogram test was performed on all strains using the Kirby-Bauer method for antibiotics: ciprofloxacin (CIP), fosfomicin (FO), trimethoprim-sulfamethoxazole (TSX), penicillin (P), vancomycin (VA), tetracycline (TE), erythromycin (E), oxacillin (OX), macrolides (MAC), clindamycin (CC), gentamicin (GM), and cephalothin (CF).

Results. 87 methicillin-resistant *Staphylococcus aureus* (MRSA) carriers (5%) were found, of which 21 are carriers in both anatomical sites (1.2%), 35 are MRSA carriers exclusively in the nose (2%) and 31 MRSA carriers. exclusive in pharynx (1.8%), having a total of 108 MRSA strains. The antibiotic to which the *S. aureus* strains show the greatest resistance is P (96 strains - 88.9%), followed by CC (67 strains - 62%), E (33 strains - 30.5%), OX (22 strains - 20.4 %), TE (18 strains – 16.7%), CIP, FO and VA (10 strains – 9.2%), CF (7 strains – 6.5%), GM (6 strains – 5.5%), TSX (3 strains – 2.8%) and finally MAC (2 strains – 1.9%). In this sense, 25 strains only present resistance to one antibiotic (P) (23.1%), 40 strains are resistant to 2 antibiotics (37%), 18 have resistance to 3 antibiotics (16.7%), 7 strains present resistance to 4 antibiotics (6.5%), another 7 strains are resistant to 5 antibiotics (6.5%), 4 strains are resistant to 6 antibiotics (3.7%), only one strain is multi-resistant to 8 antibiotics (0.9%) and one more strain is resistant to 9 antibiotics (0.9%). The most common combination of resistance patterns was P and CC (60 strains – 55%), the strain with resistance to 8 antibiotics (CIP, FO, TSX, VA, TE, OX, MAC and GM), the one with 7 antibiotics (P, VA, TE, E, OX, CC and CF).

Conclusions. A low percentage of MRSA carriers was isolated in the sampled population, although there were more nasal (2%) than pharyngeal (1.2%) carriers. The main antibiotics to which they present resistance are penicillin, clindamycin, and erythromycin. 77% of all the strains analyzed present resistance to at least two antibiotics.