Study of Toxic Profile of *Staphylococcus aureus* Isolated From Raw Milk Samples and Food Products in in Oran Area, Algeria.

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Abstract

The presence of *S. aureus* causes damage to the mammary gland tissue that will impact milk production in both volume and quality. The many virulence factors such as toxins and proteins or surface polysaccharides are involved in the pathology. The current study aimed to characterize *Staphylococcus aureus* isolates from milk and food products. A total of 223 S. aureus isolates from various raw and processed foods were obtained and identified using matrix-assisted laser desorption and ionization time-of-flight mass spectrometry. Isolates were characterized by antimicrobial susceptibility testing and toxin gene detection. Methicillin-resistant *Staphylococcus aureus* (MRSA) isolates were identified by detection of the mecA gene and characterized by staphylococcal cassette chromosome mec (SCCmec) typing. We found that 30.9% (153/495) of food samples were contaminated with S. aureus.Thirty three (21.5%) S. aureus isolates were identified as MRSA, and 16.9% (26/153) carried the mecA gene. Three SCCmec types were identified of which type IV was the most common (69.2%) followed by type V (15.3%) and type II (7.6%). Two MRSA isolates were not typable with SCCmec typing. None of the examined isolates harbored mecC. Furthermore, 14.3% (22/153) of the isolates were toxigenic S. aureus. The cytotoxin gene pvl was detected in 11.1% of the S. aureus isolates. This gene was more commonly detected (76.4%) in MRSA isolates than in methicillin-suceptible *Staphylococcus aureus* (MSSA) isolates. The tsst-1 gene coding for toxic shock syndrome toxin was isolated rarely (3.2%) and only in MSSA isolates. According to disk diffusion test results, 70 isolates were resistant to only one antimicrobial drug, and 51 (33.3%) isolates were multidrug resistant. Other 32 isolates were susceptible to all antibiotics. Toxins research shows that only a few strains have proven carriers of different virulence genes including the gene encoding the *pvl* Panton-Valentine leukocidin. Other strains were positive for the presence of tst gene encoding the toxin of toxic shock syndrome (TSST-1), 100% of the *Staphylococcus aureus* isolates identified were sensitive to methicillin. Our study highlights, for the first time, a high prevalence of multidrugresistant S. aureus isolates carrying pvl or tsst-1 found in food products in Algeria. The risk of MRSA transmission through the food chain cannot be disregarded, particularly in uncooked foods. This study is the first molecular characterization study of animal strains of *S. aureus* isolated in the region of Oran

Keywords: milk, mastitis, *Staphylococcus aureus*, MRSA, SCCmec, virulence genes, *pvl, TSST-1, sea ;* foodstuffs, Algeria