Virulence factors and genetic characteristics of methicillin-resistant and -susceptible staphylococcus aureus isolates in Myanmar

Abstract

Staphylococcus aureus produces virulence factors, including various exotoxins and adhesins, which are associated with a variety of symptoms caused by its infections. In the present study, the prevalence of these virulence factors was analyzed for 23 S. aureus strains isolated from wound infections in hospitals, nasal swabs, or vomit from patients and cooks in a food poisoning case and from healthy adults in Yangon, Myanmar. Among these strains, five were methicillin-resistant S. aureus (MRSA) derived from pus (four strains, SCCmec III, ST239) and a healthy adult (one strain, SCCmec-IVa, ST5). The Panton-Valentine leukocidin (PVL) gene was detected in five methicillin-susceptible S. aureus (MSSA) clinical strains belonging to ST121 (CC121). The MRSA clinical strains had only a few or no staphylococcal enterotoxin (SE) genes, whereas PVL-positive MSSA and an MRSA strain from a healthy adult possessed an enterotoxin gene cluster (seg, sei, sem, sen, seo, and selu). Strains from the food poisoning case had either SE genes or only etd and edin-B. Adhesin genes, which are associated with binding to fibronectin, fibrinogen, and elastin, were detected in all the MRSA and most of the MSSA strains examined. However, the bone sialoprotein-binding protein gene (bbp) and the variant form of the elastin-binding protein gene (ebpS-v) with an internal 180 bp deletion were identified only in the MSSA strains harboring the PVL gene. These findings suggest that those genetic traits are characteristic of PVL-positive ST121 S. aureus strains in Myanmar.