Humoral immune consequences of Staphylococcus aureus ST239-associated bacteremia

ABSTRCT

The humoral immune responses against 46 different staphylococcal antigens in 27 bacteremia patients infected by clonally related methicillin-resistant Staphylococcus aureus (MRSA) strains of a single sequence type (ST) 239 were investigated. A group of non-infected patients (n = 31) hospitalized for different reasons served as controls. All strains were confirmed as ST 239 by S. aureus and mecA-specific PCR, spa, and multi-locus sequence typing (MLST). In each bacteremia patient, a unique pattern of S. aureus antigen-specific immune responses after infection was observed. Antibody levels among bacteremia patients were significantly higher than controls for HlgB (P = 0.001), LukD (P = 0.009), LukF (P = 0.0001), SEA (P = 0.0001), SEB (P = 0.011), SEC (P = 0.010), SEQ (P = 0.049), IsaA (P = 0.043), IsdA (P = 0.038), IsdH (P = 0.01), SdrD (P = 0.001), SdrE (P = 0.046), EsxA (P = 0.0001), and SA0104 (P = 0.0001). On the other hand, the antibody levels were significantly higher among controls for SSL3 (P = 0.009), SSL9 (P = 0.002), and SSL10 (P = 0.007) when the IgG level on the day of infection was compared with that measured on the day of admission. Diversity was observed in the immune response against the antigens. However, a set of antigens (IsaA, IsdA, IsdH, SdrD, and HlgB) triggered a similar type of immune response in different individuals. We suggest that these antigens could be considered when developing a multi-component (passive) vaccine. SEA and/or its specific antibodies seem to play a critical role during ST239 MRSA bacteremia and SEA-targeted therapy may be a strategy to be considered.

.**Keyword:** Humoral immune; Methicillin-resistant Staphylococcus aureus (MRSA); Bacteremia patients.