

## Dissemination of resistance and virulence determinants in methicillin-resistant *Staphylococcus aureus* during colonization and disease: a review

### ABSTRACT

The successful *in vivo* horizontal transfer of mobile genetic elements carrying resistance and virulence determinants have contributed immensely to a global dissemination of virulent and multi-drug resistant pathogens. The pathogenesis of MRSA infection is enhanced via initial colonization of the skin through the component of the microbial surface antigen recognizing adhesive matrix molecules and by their ability to evade host immune response. Furthermore, it was also observed that the genetic diversity of pathogenic MRSA is due to its' ability to rapidly acquire resistance and virulence determinants. A characteristic feature that made it one of the most important nosocomial pathogen worldwide. Similarly, the expression of virulence gene in MRSA has been observed to be regulated by the accessory gene regulator system (*agr*). These system is made up of a series of genes whose product build up quorum-sensing regulatory mechanisms that is growth dependent. At a certain growth stage, the *agr* systems triggers a pronounced changes in the expression of genes called the quorum sensing. The findings of this review affirmed the importance of horizontal gene transfer in the dissemination of resistance and virulence determinants and as well as the genetic diversity of MRSA.

**Keyword:** Accessory gene regulators; Colonization; Horizontal gene transfer; Resistance; Virulence