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Secular trends of methicillin-resistant Staphylococcus aureus (MRSA) at Geneva University Hospitals (HUG) over a 14-year period

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Introduction

Controlling MRSA has been a challenge for Geneva University Hospitals (HUG), particularly after the introduction of ST228 SCCmecI hyperendemic clone in 1999.

Objectives

To describe HUG's secular trends of MRSA, infection control measures and predominant MRSA clones using Staphylococcal chromosomic cassettes (SCCmec) genotyping.

Methods

A multifaceted MRSA prevention program initiated in 1993 included patient screening, decontamination, surveillance, contact isolation, an alert system and a hospital-wide hand hygiene campaign (HHC); subsequently strengthened by: an educational campaign (2003), routine MRSA SCCmec genotyping (2005), a 2nd HHC, periodic audits and feedback (2006). The intensive care unit performed MRSA screening on admission, discharge and weekly since 2004. Surveillance included: (1) incidence rates (IR) of hospital acquired (HA)-MRSA infection or colonization; (2) HA-MRSA bloodstream infections (BSI); (3) proportion of MRSA/*S. aureus* BSI; (4) IR of MRSA clinical cultures (CC); (5) proportion of SCCmec in MRSA strains, assessed by routine multiplex PCR assay. Representative isolates were grouped in MLVA clusters to evaluate genomic diversity and subjected to MLST.

Results

At HUG, from 2000-2014, 12,543 patients were MRSA-colonized or infected (incl. >75% screening swabs; 530 BSI). From 2000-2007, annual rates of all indicators showed an increasing trend, declining since 2008. New HA-MRSA cases per 100 admissions increased from 1.36 to 2.00 (2006), and then declined to 0.29 (2014). Trends expressed by incidence density of cases per 1000 hospital-days: HA-MRSA, from 0.92 to 1.36 (2007) to 0.21 (2014); ICU-acquired HA-MRSA from 2.3 (2002) to 10.5 (2006) to 1.31 (2014); MRSA-CC rates from 0.68 to 1.44 (2008), to 0.24 (2014); HA-BSI from 0.049 to 0.07 (2009), to 0.016 (2014). The proportion of MRSA/*S. aureus* BSI remained around 34% (2000-2009), declining to 18% (2014). SCCmecI strains declined from 83% (2005) to 32% (2014); SCCmecII and SCCmecIV were higher in non-acute settings.

Conclusion

A multifaceted prevention program and possible changes in biologic fitness of the ST228 SCCmecI clone helped to decrease endemic MRSA rates for the last 7 years.

Disclosure of interest

None declared.

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