Community acquired MRSA infections – a new challenge

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Resistance to methicillin (the first beta-lactamase stable penicillin and precursor to flu/cloxacillin) was first seen amongst hospital isolates of *Staphylococcus aureus* (*S. aureus*) in the early sixties. Since then methicillin-resistant *S. aureus* (MRSA) has become widespread in hospitals and particularly intensive care units around the world. In addition, resistance to methicillin has extended to other antimicrobial groups including macrolides, quinolones and aminoglycosides such that the term MRSA is also often used as an abbreviation for multiply-resistant *S. aureus*. MRSA is now one of the most common causes of bacterial hospital infections, accounting for 40 - 70% of the *S. aureus* infections in intensive care units. This is particularly the case in the local setting where prevalence of MRSA is amongst the highest in Europe (Figure 1).

Until some years ago, acquisition of MRSA colonisation or infection was generally considered to be restricted to the nosocomial setting and isolates of MRSA from individuals in ambulatory care would invariably be traced to a previous hospitalisation or close contact with a recently hospitalised individual. However, in the past decade new strains of MRSA have emerged in the community, causing aggressive infections in young, otherwise healthy people. Suppurative skin infections and less frequently severe necrotising pneumonias are the most well-known clinical syndromes caused by these new strains.

The ability of new community-acquired MRSA (CA-MRSA) strains to colonise hosts in the community and cause clinical syndromes is mediated by unique combinations of traditional and newly described virulence factors. The most well-known community-acquired MRSA virulence factor is Panton Valentine Leucocidin (PVL), which elicits tissue necrosis and may contribute substantially to the clinical findings in young otherwise healthy individuals. CA-MRSA isolates have been associated with many of the clinical presentations known to occur with traditional *S. aureus* infection.

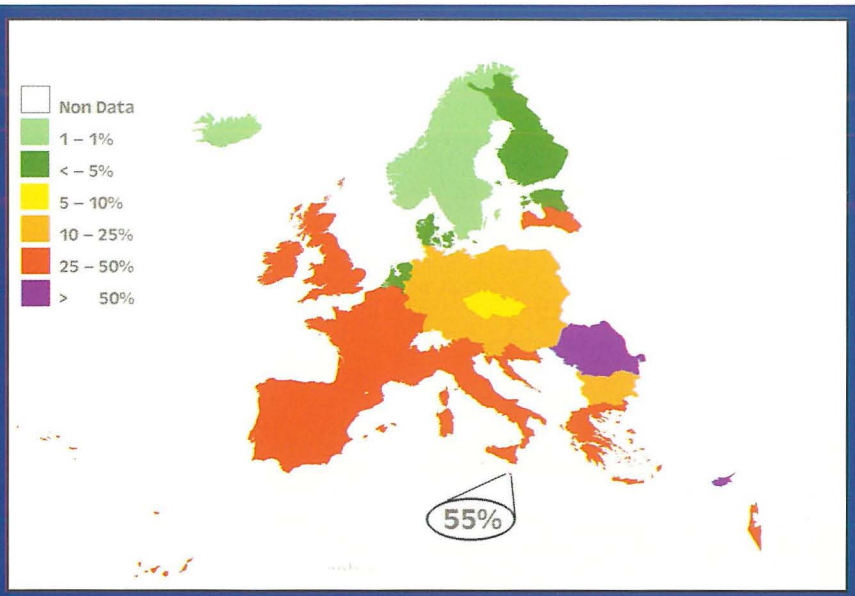

Figure 1: *Prevalence of methicillin resistance in S. aureus isolates from blood cultures in hospitals participating in the European Antimicrobial Resistance surveillance System (EARSS) [www.earss.rivm.nl]*

However, outbreaks of epidemic furunculosis and severe invasive paediatric infections caused by community acquired MRSA have been particularly noteworthy.

The main mode of transmission of CA-MRSA is, like its hospital equivalent, via hands which may become contaminated by contact with colonized or infected body sites of other individuals or devices, items or environmental surfaces contaminated with body fluids containing MRSA. Other factors contributing to transmission include skin-to-skin contact, crowded conditions and poor hygiene.

The criteria for distinguishing (CA-MRSA) from healthcare/hospital-associated MRSA (HA-MRSA) includes:

- Diagnosis of MRSA made in the outpatient setting or by a culture positive for MRSA not later than 48 hours after admission to the hospital;
- No medical history of MRSA infection or colonization;
- No medical history in the past year of:
  - Hospitalization,
  - Admission to a nursing home, skilled nursing facility or hospice,
  - Dialysis,
  - Surgery;
- No permanent indwelling catheters or medical devices that pass through the skin into the body.

Because of different definitions of community acquired infections used in the literature and the limited number of population-based studies that include molecular typing techniques, the reported prevalence of MRSA in the community varies widely. However, regardless of the definition, prevalence of CA-MRSA seems to be increasing. In a meta-analysis, Salgado and colleagues summarised many studies reporting the prevalence of community onset MRSA both with and without health-care associated risk factors in the community. When *S. aureus* strains isolated from routine clinical specimens were used as the baseline and cases were defined based on the timing of isolation of MRSA in relation to the time of admission, the pooled data from 27 retrospective studies (5932 patients) and from five prospective studies (636 patients) showed prevalence of community-onset infection among hospitalised patients with MRSA isolates of 30·2% and 37·3%, respectively. Around 85% of community-onset MRSA patients in both the retrospective and prospective groups reported at least one healthcare/hospital associated risk factor.

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Winning with TheSYNAPSE

TheSYNAPSE Internet Portal has, for the past few months, been publishing a number of eQUIZes for Maltese Medical Doctors. We are pleased to publish the winners of the eQUIZes for the first Quarter of 2006.

Company	Product	Winner
Sanofi Aventis	**Telfast**	Dr Michael A. Borg
Sanofi Aventis	**Ketek**	Dr Tania Van Avendonk
Sanofi Aventis	**Tavanic**	Dr Mary Rose Cassar
Bayer	**Avalox**	Dr Alex Magri
Actavis	**Tirabicin**	Dr Doreen Cassar
Lundbeck	**Cipralex**	Dr Tonio Bugeja
Sanofi Aventis	**Rhinatiol**	Dr Julian Mamo

There are lots of other planned eQUIZes and other opportunities planned for the coming months and you could be one of the winners. Be sure you are eligible to participate by making sure you are a member of TheSYNAPSE internet community and receive your weekly eNEWS. If you have any queries please contact our helpdesk by email on helpdesk@thesynapse.net .

Note

Part II of the series Cardiology Today by Prof. Albert Fenech will be featured in the next issue of TheSYNAPSE magazine and not in this issue as previously announced.

Errata...

A number of articles in the November 2005 Issue were published without the list of references. All references will now appear in the on line version of the magazine which is being published. We apologise to the authors and audience for the inconvenience.

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In the second group, ten studies reporting the prevalence of MRSA in the community using surveillance cultures were analysed. The pooled data (8350 patients) showed a prevalence of 1·3% for MRSA colonisation. Again, most people colonised with MRSA had associated risk factors. After excluding those patients, the prevalence of MRSA colonisation was only 0·2%.

There is no local data at this time that would shed light on the prevalence of CA-MRSA in Malta. Microbiological investigations sent to St Luke's Hospital are few and far between and even when available, it is impossible to know whether the patient in question had previous hospital exposure.

Nevertheless equivocal circumstances would indicate that CA-MRSA is present in the local ambulatory care environment. We have seen a number of cases of children admitted to hospital with pyrexia of unknown origin in which blood culture has yielded isolates of CA-MRSA. In addition it is not uncommon for (usually young) adults suffering from recurrent boils and/or skin infections which appear refractory to treatment to be referred to the SLH microbiologists for advice and who after bacteriological tests of the lesions and/or screening swabs from nose, axilla and/or groin yield isolates of CA-MRSA. In general the resistance profile of these strains tends to be less extensive than that found in hospital strains and would be amenable to treatment with alternative oral antibiotics and or topical antiseptics.

It is therefore vital for clinicians to be aware of the possibility of CA-MRSA in circumstances where infective skin lesions such as boils and furuncles do not respond to conventional therapy. In general, if initial antibiotic therapy is not effective, a culture should be obtained from the infection site and sent to a microbiology laboratory. This is best done by obtaining either a small biopsy of skin or drainage from the infected site. A culture of a skin lesion is especially useful in recurrent or persistent cases of skin infection, in cases of antibiotic failure and in cases that present with advanced or aggressive infections. Where a swab for culture is taken from pus after excision of a skin boil, it is important that the skin is prior disinfected with 70% alcohol which is left to dry before incision and swabbing. In this way the possibility of contamination of the swab with skin commensals is eliminated. Expert advice on the antibiotic management of patient with CA-MRSA from a microbiologist or infectious disease physician is always recommended.

Bibliography

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2. Salgado CD, Farr BM, Calfee DP. Community-acquired methicillin-resistant Staphylococcus aureus: a meta-analysis of prevalence and risk factors. *Clin Infect Dis* 2003; 36:131-9.