

CA-MRSA

DR Y. MAHABEER



INTRODUCTION

- Started in 1980s but eruption in 1990s!
- Now widespread
- Huge problem in USA - >half ER patients with SSTI had CA-MRSA*

*Moran et al. N Engl J Med 2006;355:666-74




CA-MRSA(CDC)

- outpatient setting or within 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.

PITFALLS

- Healthcare exposure does not exclude CA-MRSA
- AND CA-MRSA circulate in hospitals!
- 616 MRSA isolates
- 404/616 healthcare exposure
- BUT about 40% had isolates with features of “CA-MRSA” *

* David et al. JID. 2008;107:1235-43



PARAMETER	HA-MRSA	CA-MRSA
<u>Patient</u>	Older Chronic illness	Young Healthy
<u>Resistance</u>	Multidrug	More susceptible
<u>Infection</u>	Bacteraemia IV lines VAP Surgical site	Mainly SSTI Necrotising pneumonia Septic shock Bone & joint
<u>Virulence</u>	PVL absent	PVL present
<u>SCCmec</u>	I/II/III	IV/V



TRANSMISSION

- **5 “Cs”**
 - **C**ontact (skin-skin)
 - (Lack of) **C**leanliness
 - **C**ompromised skin integrity
 - **C**ontaminated objects, surfaces, fomites eg towels, equipment etc
 - **C**rowded conditions
- ? Prior antimicrobial use



HIGH RISK GROUPS

- Children
- Athletes/contact sports
- Indigenous populations
- Prisoners
- Military personnel
- MSM
- IVDU

TYPING

- PFGE eg US300, US400
- MLST (ST8,ST1,ST80,ST5 etc)
- SCC*mec* (MRSA-IV, MRSA-II etc)



EPIDEMIOLOGY

Chua et al. CID 2011;52(1):99-114




USA & CANADA

TYPES

- US300,US400,US1000,US1100
- US300 predominant(ST8-MRSA-IV)
- US400(ST1-MRSA-IV) in Alaska

ANTIBIOGRAM

- US300
 - S to clindamycin, tetracycline, TMP/SMX
 - R to erythromycin & gatifloxacin
 - Emerging resistance!

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- US400
 - First documented
 - R to erythromycin & clindamycin
 - S to others

EUROPE

- Low prevalence
- Heterogenous
- *lukSF-PV*- positive ST80-MRSA-IV
 - S to erythromycin, clindamycin, quinolones
 - R to tetracycline

AUSTRALIA

- CA MRSA increasing
- Mostly ST93-MRSA-IV(*lukSF-PV*-positive)
 - S to erythromycin, clindamycin, TMP/SMX, tetracyclines, quinolones

AFRICA

- VERY LITTLE DATA
- 86 MRSA isolates from five African towns*
 - ST88-MRSA-IV ($n = 24$, 28%)
 - ST5-MRSA-IV ($n = 18$, 21%)


*Breurec et al. Clin Micro Infect
2011;17(2):160-5

SOUTH AFRICA

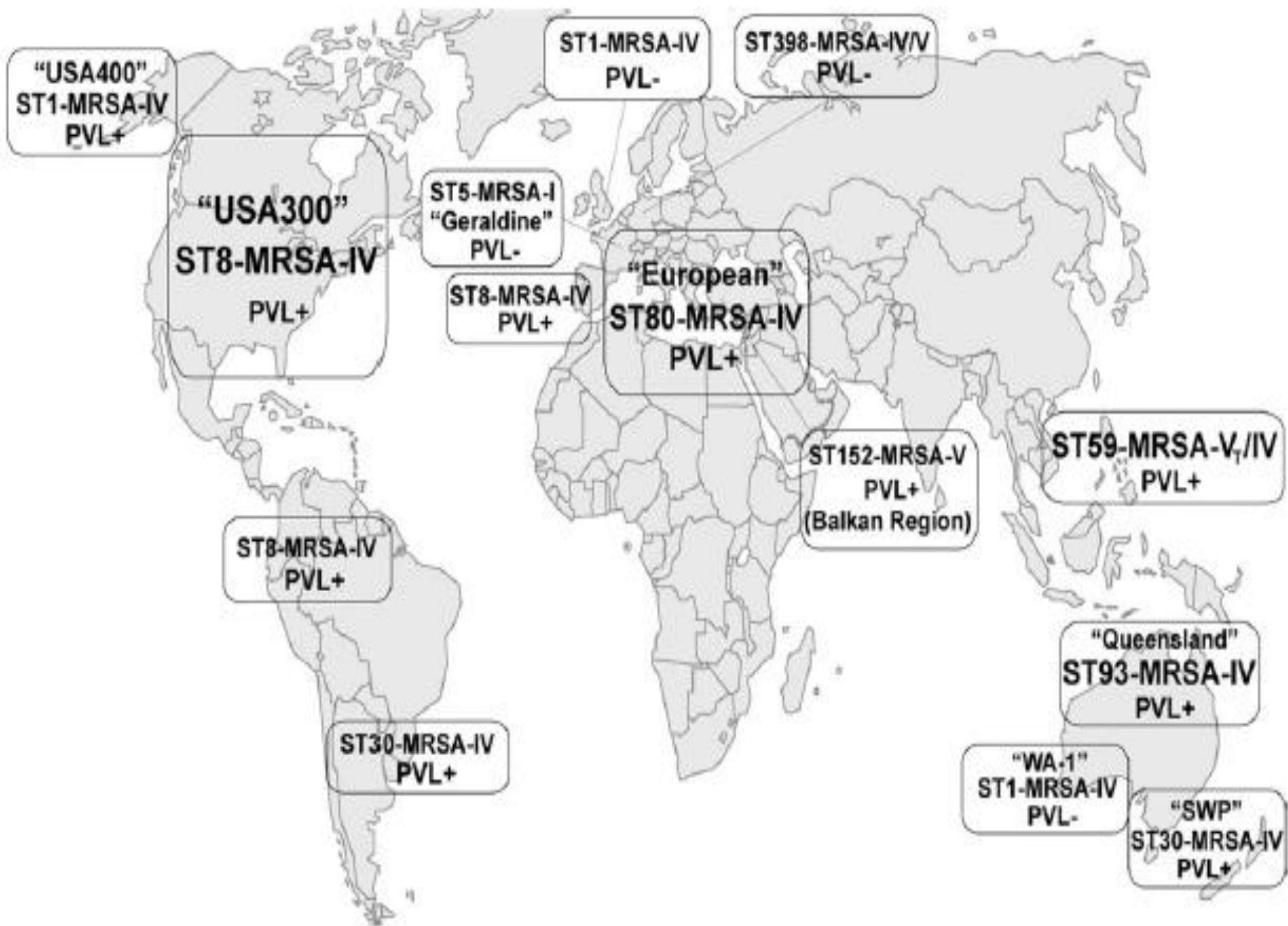
- SA - SCC*mec* types of 302 MRSA isolates
 - 36.7% were type IV (Paediatric clone)¹
- Pretoria – 97 MRSA²
 - 4% CA-MRSA (SCC*mec* IV)

¹(Oosthuysen W.F et al.17th ESCMID, Germany, 2007)

²(Magothlo P.E et al. FEMS Imm & Med Micro. 2009;57(2):104-115)

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- **MLST of 24 MRSA in KZN**
 - 16(67%) were ST8-MRSA-IV
 - 2(8%) were ST5-MRSA-IV(Paediatic clone)
 - 1(4%) was ST45-MRSA-IV

(Essa et al. SAJEI.2009;24(1):4-7)






VIRULENCE FACTORS

- PVL
- ACME (Arginine catabolite mobile element)
 - Colonise healthy skin
 - Interferes with nitric oxide production
- PSM (phenol soluble modulins)
 - Activate, recruit & lyse Np

CLINICAL DISEASE

- SSTI
 - Abscess (spider bite)
 - Other (folliculitis- “boils”, cellulitis)
 - Recurrence a problem
 - Cant distinguish from MSSA except for “spider bite”



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- Severe infections
 - Severe sepsis
 - Necrotising pneumonia
 - Necrotising fasciitis
 - Septic thrombophlebitis
 - Osteomyelitis

TREATMENT

- SSTI
 - Uncomplicated vs complicated
 - Uncomplicated (<5cm)– Incision & drainage
 - Complicated – add abt
 - Take samples for culture & susceptibility
 - Depends on local susceptibility eg USA
 - clindamycin (do D test)
 - Avoid quinolones, TMP/SMX, limited data on tetracyclines in SSTI

TREATMENT

- SEVERE INFECTIONS
 - Send samples
 - Vancomycin – primary agent
 - Other options eg daptomycin, linezolid, tigecycline, clindamycin
 - Discuss with ID
 - Limited evidence for adjunctive clindamycin
 - Limited evidence for IVIG



PATIENT ADVICE

- Wound care
- Hand hygiene
- General hygiene - bathing.
- No sharing of possibly contaminated items eg towels, clothing, bedding, bar soap, razors
- Proper laundry
- Avoid activities involving skin contact
- Environmental & fomite cleaning

DECOLONISATION

- Decolonisation
 - Nasal mupirocin
 - Washes(chlorhexidine/1% triclosan)
 - Oral abt(rifampicin/fusidic acid/clindamycin)
- Little data for CA-MRSA-outbreak settings
- Mupirocin alone – not useful
- ? Value of decolonisation in recurrent infections/control of outbreak

CONCLUSION

- Boundaries are blurred
- CA-MRSA mainly SSTI (spider bite)
- Seen mainly in Northern America
- US300 causes most disease in USA
- Clones vary & antibiograms vary – impacts on therapy
- Problem of resistance over time