SURVEILLANCE FOR GLYCOPEPTIDE-RESISTANT ENTEROCOCCI

Drs N Bosman, T Nana & C Sriruttan
CMID
NHLS

GLOBAL DATA

- **VRE** first isolated in Europe in **1987**, (Leclercq R., et al 1988) and in the USA soon thereafter

- By **1993**, there had been a 20-fold increase in VRE prevalence in ICUs in the US (NNIS report 2001)
- Most recent NNIS (**2004**) shows > 28% of enterococcal isolates in ICUs (> 300 hospitals)

- European Antimicrobial Resistance Surveillance System reported on *Enterococcus faecium* resistance trends: **2001-2008**

  total number of invasive *E. faecium isolates* (33 countries) 4,888
  - 16 countries with < 20 isolates (10 of these with no VRE)
  - 3 countries with >25% (Greece, Ireland, UK)

- In the United States and Europe, the 3 major phenotypes : VanA, VanB, and VanD

- VanA is the most common

- Sweden - mandatory to report VRE (infections and colonised)
  - alarming spread of VRE since 2007
  - clonal spread of *E.faecium vanB*

- Increasing rates in Asia, South America, Australia

GLOBAL DATA

ELSEVIER

Available online at www.sciencedirect.com
ScienceDirect

Diagnostic Microbiology and Infectious Disease 58 (2007) 163–170

DIAGNOSTIC MICROBIOLOGY AND INFECTIOUS DISEASE

www.elsevier.com/locate/diagmicrobio

Antimicrobial resistance and molecular epidemiology of vancomycin-resistant enterococci from North America and Europe: a report from the SENTRY antimicrobial surveillance program

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GLOBAL DATA

Global Spread of Vancomycin-resistant *Enterococcus faecium* from Distinct Nosocomial Genetic Complex

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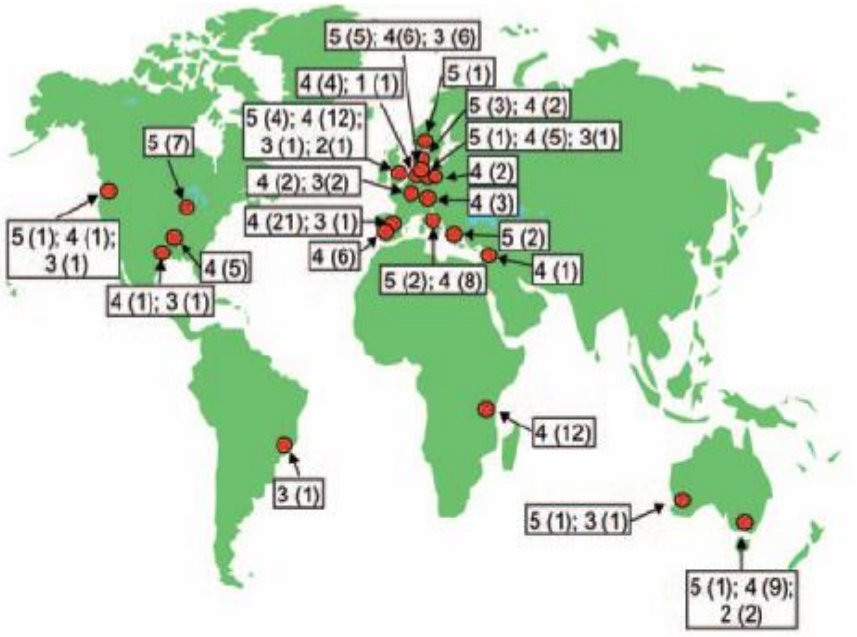

Figure 4. Global distribution of complex-17 isolates. Red circles indicate cities where complex-17 isolates were recovered. Numbers indicate epidemiologic sources: 1, animal isolates; 2, human community surveillance isolates; 3, surveillance (feces) isolates from hospitalized patients; 4, human clinical isolates; 5, isolates from documented hospital outbreaks. Numbers of isolates are indicated in parentheses.

Emerging Infectious Diseases • www.cdc.gov/eid • Vol. 11, No. 6, June 2005

SA DATA

- **1998 SAJEI. Derby P et al.**

  Detection of glycopeptide-resistant enterococci using susceptibility testing and PCR.

- 1993 Princess Alice,Cape Town : *E. faecium vanA*
- 1995 Universitas, Bloemfontein: 4 *E. faecalis vanB, 1 E. gallinarum*
- 1997 GSH,Cape Town : *2 E. gallinarum* from screening of 230 clinical isolates

SA DATA

ANTIMICROBIAL AGENTS AND CHEMOTHERAPY, Oct. 1998, p. 2752–2755 Vol. 42, No. 10
0066-4804/98/$04.00+0

In Vitro Activities of 15 Antimicrobial Agents against Clinical Isolates of South African Enterococci

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Received 4 February 1998/Returned for modification 31 May 1998/Accepted 17 July 1998

The activities of a panel of currently available antibiotics and the investigational agents LY 333328, linezolid, CL 331,002, CL 329,998, moxifloxacin (BAY 12-8039), trovafloxacin, and quinupristin-dalfopristin against 274 clinical isolates of enterococci were determined. No vancomycin resistance or β-lactamase production was observed. Except for 12 isolates (all non-*Enterococcus faecalis*) showing reduced susceptibility to quinupristin-dalfopristin (MIC, ≥4 μg/ml), the new agents exhibited promising in vitro antienterococcal activity.

Isolates from 1996 May – 1997 July

No VRE

SA DATA

- **1997 SAMJ. Budavari SM et al.**
  Emergence of VRE in SA

- Described the first 2 GRE infections in SA

- CHB : *E. faecalis (vanA)*

- JHB : *E. faecium (vanA)**

First confirmed death contributed to by GRE infection in SA

*Strain isolated subsequently from
- other patients at same hospital and 2 private hospitals in May 1998 (v Gottberg A et al 2000),
- and from majority of patients involved in an outbreak at that hospital in Nov 1998 (McCarthy K.M et al 2000)

SA DATA

JOURNAL OF CLINICAL MICROBIOLOGY, Feb. 2000, p. 905–909
0095-1137/00/$04.00+0

Vol. 38, No. 2

Epidemiology of Glycopeptide-Resistant Enterococci Colonizing High-Risk Patients in Hospitals in Johannesburg, Republic of South Africa

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Department of Clinical Microbiology and Infectious Diseases, University of the Witwatersrand, and the South African Institute for Medical Research, Johannesburg, Republic of South Africa

May 1998

- prevalence study in 4 Johannesburg hospitals (2 state, 2 private)
-184 rectal swabs from patients at high risk for GRE colonisation
-20 GRE recovered (10.9%) (7%)

10 *E. faecium vanB*
6 *E. gallinarum vanC1*
3 *E. faecium vanA*
1 *E. avium vanA*

-Macrorestrestriction analysis :

clonal spread of *vanA* and *vanB* within different hospitals, possible interhospital spread, and likely
persistence of *E. faecium vanA* associated with first GRE confirmed death

- Found a significantly higher prevalence in private hospitals (19.6% vs 7.5%)

SA DATA

Journal of Hospital Infection (2000) 44: 294–300
Article no. jhin.1999.0696, available online at http://www.idealibrary.com on IDEAL®

Control of an outbreak of vancomycin-resistant *Enterococcus faecium* in an oncology ward in South Africa: effective use of limited resources

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1998 Nov

-Large teaching hospital in JHB

- Outbreak strain identified as *E. faecium vanA* resistance genotype

-Majority of strains clonally related

-Modified infection control interventions implemented in accordance with available resources

-Showed epidemiology to be similar to that described in the developed world

SA DATA

ELSEVIER

International Journal of Antimicrobial Agents 24 (2004) 119–124

INTERNATIONAL JOURNAL OF Antimicrobial Agents

www.ischemo.org

Determining incidence of extended spectrum β-lactamase producing Enterobacteriaceae, vancomycin-resistant *Enterococcus faecium* and methicillin-resistant *Staphylococcus aureus* in 38 centres from 17 countries: the PEARLS study 2001–2002

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2001-2002

No VRE isolated from SA (0/21 *E. faecium* submitted)

GOING FORWARD…

IMPACT OF GRE

- Added morbidity and mortality (Rice et al.,2004)
- Added cost
- Limited treatment options
- Transfer of resistance elements to other, more virulent bacteria – VRSA (Tenover et al.,2004)

SURVEILLANCE

- Establish baseline prevalence data locally, regionally and nationally

- Magnitude of the problem
- Antimicrobial resistance patterns - identify resistance determinants
- Crucial for monitoring impact of interventions
- Track changing epidemiology

?????

- Any other labs and hospitals with similar issues/information to share
- Surveillance : should we look to

  - include GRE in SASCM data – sterile sites

  - collect data on MICs for vancomycin, teicoplanin, linezolid

  - collect molecular epidemiology data to determine clonality

  - create a SASCM driven working group with the aim to analyse, compile, disseminate data, and

  - formulate/contribute to guidelines for GRE

Thanks and Acknowledgements

- Staff at CMJAH, Microbiology Lab
- Staff at Infection Control Services Lab
- Professor Adriano Dusé
- Dr Warren Lowman
- Dr Jeanette Wadula
- Dr Sharona Seetharam
- Dr Ranmini Kularatne
- CMID Microbiology Registrars