SURVEILLANCE FOR GLYCOPEPTIDE-RESISTANT ENTEROCOCCI

Drs N Bosman, T Nana & C Sriruttan
CMID
NHLS

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**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

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

Lalitagauri M. Deshpande*, Thomas R. Fritschea, Gary J. Moeta, Douglas J. Biedenbacha, Ronald N. Jonesa,b

aJMI Laboratories, North Liberty, IA 52317, USA
bTufts University School of Medicine, Boston, MA 02111, USA
Global Spread of Vancomycin-resistant *Enterococcus faecium* from Distinct Nosocomial Genetic Complex

Rob J.L. Willems,† Janetta Top,† Marga van Santen,‡ D. Ashley Robinson,† Teresa M. Coque,§ Fernando Baquero,§ Hajo Grundmann,† and Marc J.M. Bonten†

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.
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

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

M. C. STRUWIG,* P. L. BOTHA, AND L. J. CHALKLEY

Department of Medical Microbiology, University of the Orange Free State, Bloemfontein 9300, South Africa

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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

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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)
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

-Macrorestriction 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%)

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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
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


* Laboratories International for Microbiology Studies, 2122 Palmer Road, Schaumburg, IL 60173-3817, USA
* Wyeth Pharmaceuticals, St. Davids, PA, USA
* Wyeth Research, Pearl River, NY, USA

2001-2002

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

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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
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