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Glycopeptide-Resistant *Enterococcus faecium*

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Thal and coworkers from Wayne State University in Detroit conducted a study to evaluate the molecular relatedness of clinical isolates of glycopeptide-resistant *Enterococcus faecium* isolates collected from hospitals in Michigan. The 379 isolates used in this study all were vancomycin-resistant *E. faecium* isolates collected from 28 hospitals and three extended-care facilities from 1991 to 1996. There were 73 pulsed-field gel electrophoresis (PFGE) strain types; within strain types, there were as many as six restriction fragment differences. Most isolates (70%) belonged to 1 of 6 strain types, which were designated M1 (36%), M2 (3%), M3 (18%), M4 (6%), M10 (4%), and M11 (3%).

PFGE strain M1 was isolated from 135 patients in 13 hospitals dur-

ing the period 1993 to 1996. Strain type M2 was isolated from 11 patients in two hospitals during the period 1991 to 1992 and was not observed after 1992. Strain type M3 was isolated from 70 patients in 10 hospitals during the period of 1994 to 1996. M4 and M10 were isolated from 23 patients in 3 hospitals and from 15 patients in 2 hospitals, respectively, during 1995 to 1996. M11 was isolated from 13 patients in 4 hospitals during 1996. A total of 23 of 28 hospitals had evidence of clonal dissemination of some isolates. Plasmid content and hybridization analysis done on 103 isolates from 1 hospital and 2 affiliated extended-care facilities indicated that the strains contained from one to eight plasmids.

Mating experiments indicated transfer of vancomycin resistance from 94 of these isolates into plasmid-free *E. faecium* GE-1 at transfer frequencies of $<10^{-9}$ to 10^{-4} . Gentam-

icin resistance and erythromycin resistance were cotransferred at various frequencies. A probe for the *vanA* gene hybridized to the plasmids of 23 isolates and to the chromosomes of 72 isolates. A probe for the *vanB* gene hybridized to the chromosomes of 8 isolates.

The results of this study suggest interhospital and intrahospital dissemination of vancomycin-resistant *E. faecium* strains over a 6-year period in southeastern Michigan. The majority of isolates studied belonged to the same few PFGE strains, indicating that clonal dissemination was responsible for most of the spread of resistance that occurred.

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