misuse of antimicrobial drugs and to improve antibiotic use in healthcare systems. Along with professional societies and other stakeholders, the CDC already has started to prepare clinical guidelines for health professionals on how best to use antimicrobials. Additionally, the FDA has initiated consultations with stakeholders to refine its proposed framework for assessing the human health impact of antimicrobials that may be used in food-producing animals.

Research. Research will be provided to the community with new information and technologies, including genetic blueprints for various microbes, to identify targets for desperately needed new diagnostics, treatments, and vaccines that could assist in preventing the emergence and spread of resistant pathogens. The NIH plans to develop clinical studies to test new antimicrobials and novel approaches to treating and preventing infections caused by resistant pathogens. The NIH continues to encourage and facilitate new rapid diagnostic methods and will pursue their development and evaluate their ultimate impact in the context of antimicrobial resistance.

Product development. To identify and publicize priority health needs for new products that prevent resistance or treat resistant infections, HHS plans to create an Interagency Antimicrobial Product Development Working Group. Once formed, this group also will consult with stakeholders and economic consultants to identify incentives that encourage this kind of product development.

FROM: Centers for Disease Control and Prevention. A Public Health Action Plan to Combat Antimicrobial Resistance. CDC's antimicrobial resistance web site, http://www.cdc.gov/drugresistance.

VRE Colonization in Liver and Kidney Transplant Recipients

At Mayo Medical Center (Rochester, MN), surveillance rectal (and other-site) cultures have been collected routinely from liver transplant recipients as part of a selective bowel decontamination program. Beginning in 1995, vancomycin-resistant *Enterococcus* (VRE) colonization and infection were identified in Mayo Clinic liver and kidney transplant patients through our surveillance cultures. Patel and colleagues conducted a study to describe the natural history of VRE colonization in this patient population. Fifty-two patients with VRE colonization (predominantly with a single *van*B clone) were identified from September 1995 through December 1997. Five hundred ninety cultures were reviewed for this study (mean, 11.3 cultures/patient). The median time from initial VRE colonization to the last surveillance culture obtained was 306 (range, 1-1,393) days.

VRE infection was documented in 6 patients (11.3%). Eighteen patients (35%) met the criteria for clearance of VRE colonization, defined as VRE-negative rectal-culture results on at least three consecutive occasions greater than 1 week apart. However, VRE was detected on subsequent surveillance cultures from 2 of these patients (11% relapse rate). Of the remaining 34 patients, 16 remained colonized with VRE, and 18 did not meet the definition for clearance of VRE colonization because of incomplete follow-up.

This study documents that VRE colonization usually persists for months to years in liver and kidney transplant patients.

FROM: Patel R, Allen SL, Manahan JM, Wright AJ, Krom RA, Wiesner RH, et al. Natural history of vancomycin-resistant enterococcal colonization in liver and kidney transplant recipients. *Liver Transpl* 2001;7:27-31.

VRE Among Chronic Hemodialysis Patients

D'Agata and coinvestigators from Vanderbilt University School of Medicine, Nashville, Tennessee, conducted a study to determine the prevalence and rate of acquisition of vancomycin-resistant enterococci (VRE) among patients undergoing chronic (ie, long-term) hemodialysis who were admitted to a tertiary-care center. Serial rectal cultures for VRE were performed at hospital admission and every 5 days until hospital discharge. A total of 7 (6%) of the 119 patients were colonized with VRE at admission. Six (19%) of the 32 patients who remained in the hospital $\geq$4 days acquired VRE.

A nonambulatory status was significantly associated with colonization at admission (odds ratio, 9.7; 95% confidence interval [CI_{95}], 1.8-53; P=.01), and vancomycin exposure was significantly associated with VRE acquisition (relative risk, 1.8; CI_{95}, 1.1-2.9; P=.02). All patients acquired VRE from epidemiologically linked dialysis patients colonized with similar VRE genotypes. Hospital acquisition of VRE contributes substantially to the increasing prevalence of VRE in the chronic hemodialysis patient population.

FROM: D'Agata EM, Green WK, Schulman G, Li H, Tang YW, Schaffner W. Vancomycin-resistant enterococci among chronic hemodialysis patients: a prospective study of acquisition. *Clin Infect Dis* 2001;32:23-29.

Typing of Coagulase-Negative Staphylococci From Blood Cultures

Seo and coinvestigators from Beth Israel Deaconess Medical Center and Harvard Medical School, Boston, conducted a study to determine whether a blood culture that contains coagulase-negative staphylococci represents bacteremia or contamination. They compared molecular-typing results of coagulase-negative staphylococcal blood culture isolates with clinical criteria for true bacteremia. Pulsed-field gel electrophoresis and arbitrarily primed (AP) polymerase chain reaction (PCR) were used to determine whether patients with two or more blood cultures with coagulase-negative staphylococcal isolates had the same strain of organism in each culture (same strain bacteremia). They evaluated three different clinical criteria for bacteremia: whether the patient received more than 4 days

of antibiotics, whether there was an explicit note in the medical chart in which the physician diagnosed a true bacteremia, and the Centers for Disease Control surveillance criteria for primary bloodstream infection. Agreement between same-strain bacteremia and each definition was examined, based on the assumption that most true infections should be the result of a single strain.

The study sample consisted of 42 patients and 106 isolates. Nineteen of the 42 bacteremias (45%) were the same strain. Classification of bacteremias as same-strain correlated poorly with all three clinical assessments (range of percentage agreement, 50%-57%; range of kappa statistic, 0.01-0.15). There were both false-positive and false-negative errors. Patients with three or more positive blood cultures were more likely to have same-strain bacteremia than those with only two positive cultures (11/15 [73%] vs 8/27 [30%], P=.006). Pulsed-field gel electrophoresis was more discriminating than AP PCR (percentage agreement, 83%; kappa, 0.67).

The authors concluded that molecular typing correlated poorly with clinical criteria for true bacteremia, suggesting either that true bacteremias are frequently the result of multiple strains or that the commonly used clinical criteria are not accurate for distinguishing contamination from true bacteremia. Vancomycin treatment of clinically defined coagulase-negative staphylococcal bacteremia may frequently be unnecessary.

FROM: Seo SK, Venkataraman L, DeGirolami PC, Samore MH. Molecular typing of coagulase-negative staphylococci from blood cultures does not correlate with clinical criteria for true bacteremia. *Am J Med* 2000;109:697-704.

Nasal Carriage as a Source of *Staphylococcus aureus* Bacteremia

von Eiff and colleagues from the Institute of Medical Microbiology, Westfalische Wilhems-Universitat Munster, Munster, Germany, examined *Staphylococcus aureus* isolates from blood and from nasal specimens to determine whether the organisms in the bloodstream originated from the patient's own flora. In a multicenter study, swabs for culture were obtained from the anterior nares of 219 patients with *S aureus* bacteremia. A total of 723 isolates were collected and genotyped. In a second study, 1,640 *S aureus* isolates from nasal swabs from 1,278 patients were collected over a period of 5 years and then compared with isolates from the blood of patients who subsequently had *S aureus* bacteremia.

In the multicenter study of *S aureus* bacteremia, the blood isolates were identical to those from the anterior nares in 180 of 219 patients (82.2%). In the second study, 14 of 1,278 patients who had nasal colonization with *S aureus* subsequently had *S aureus* bacteremia. In 12 (86%) of these 14 patients, the isolates obtained from the nares were clonally identical to the isolates obtained from blood 1 day to 14 months later.

The authors concluded that a substantial proportion of cases of *S aureus* bacteremia appears to be of endogenous origin since they originate from colonies in the nasal mucosa. These results provide support for strategies to prevent systemic *S aureus* infections by eliminating nasal carriage of *S aureus*.

FROM: von Eiff C, Becker K, Machka K, Stammer H, Peters G. Nasal carriage as a source of *Staphylococcus aureus* bacteremia. *N Engl J Med* 2001;344:11-16.

Granulocyte Colony-Stimulating Factor Reduces Infection Risk in Infants

Miura and coinvestigators from Porto Alegre, Brazil, performed a randomized, double-masked, parallel-groups, placebo-controlled trial of recombinant granulocyte colony-stimulating factor (rG-CSF) administration to 44 preterm neonates who had blood cultures obtained and antibiotics begun because of the clinical diagnosis of early-onset sepsis. The treatment group (n=22) received 10 µg/kg/d of intravenous rG-CSF once daily for 3 days, and the placebo group (n=22) received an IV preparation in the same volume.

The treatment and placebo groups were of similar gestational age (29±3 vs 31±3 weeks) and birth weight (1,376±491 vs 1,404±508 g), and had similar Apgar scores and 24-hour Score for Neonatal Acute Physiology scores. The mortality rate was not different between treatment and placebo groups. However, the occurrence of a subsequent nosocomial infection was lower in the rG-CSF recipients. The rG-CSF treatment did not alter the serum concentrations of the cytokines measured (except for G-CSF). Serum G-CSF levels and blood neutrophil counts were higher in the treatment than in the placebo group 24 hours and 48 hours after dosing.

The authors concluded that the administration of three daily doses of rG-CSF to premature neonates with the clinical diagnosis of early-onset sepsis did not improve mortality but was associated with acquiring fewer nosocomial infections over the subsequent 2 weeks.

FROM: Miura E, Procianoy RS, Bittar C, Miura CS, Miura MS, Mello C, et al. A randomized, double-masked, placebo-controlled trial of recombinant granulocyte colony-stimulating factor administration to preterm infants with the clinical diagnosis of early-onset sepsis. *Pediatrics* 2001;107:30-35.

Predicting Nosocomial Infections and Deaths in ICU Patients

Nosocomial (hospital-acquired) infections are very frequent in ICUs. The risk of death after severe infection is high, but the precise rate of death in ICU attributable to nosocomial infection is not known. Escolano and coinvestigators from Paris have reported on a project to build a statistical model to predict the occurrence of nosocomial infections in ICU and the outcome of the patients. They collected data on 676 consecutive patients admitted to an ICU for more than 24 hours between 1993 and 1996. For each patient, data were collected on history, clinical examination at entry, subsequent infections, and outcome. A multistate