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Increased Use of Vancomycin Related to Indwelling Vascular Devices in Hematology-Oncology Patients

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Currently, enterococci and coagulase-positive and coagulase-negative staphylococci constitute the leading bloodstream pathogens isolated, with crude mortality rates of up to 35%. As a result, vancomycin often is used as the first-line empirical agent for febrile neutropenic and critical care patients. Worldwide reports of methicillin-resistant *Staphylococcus aureus*, in some cases with endemic proportions of 30%, have caused greater concern. Some hospitals experiencing high prevalence rates of methicillin resistance among patients infected with staphylococci have been using vancomycin for preoperative surgical prophylaxis. The widespread use of vancomycin may lead to dramatic increases in morbidity related to adverse drug reactions and to the emergence of additional vancomycin-resistant isolates, for which there may be no valid therapeutic alternative.

Dr. Javier Ena and colleagues

at the University of Iowa Hospitals conducted an epidemiologic study examining the trends of intravenous vancomycin use during a 10-year period at the University of Iowa Hospitals. They found that the rate of vancomycin use increased 20-fold from 5.7 g/1,000 patient-days in 1981 to 121.3 g/1,000 patient-days in 1991. The use of vancomycin was significantly higher in hematology-oncology areas compared with other hospital areas. The rates for each indication of vancomycin therapy were 35% for prophylaxis, 32% for empirical therapy, and 32% for therapy specifically directed by culture results. In a multivariate analysis, the presence of a "plastic" medical device (intravenous line, Hickman catheter, or other medical device) was the best independent predictor for receiving vancomycin. Although vancomycin was properly selected as prophylaxis or empirical therapy in 90% of courses evaluated, 57% of courses failed to meet appropriate criteria of drug monitoring as defined by the authors. Vancomycin was found to

cause adverse side effects in up to 35% of patients receiving the drug. Phlebitis (29%) and nephrotoxicity (22%) were the most common side effects.

The authors suggest methods that might improve vancomycin use, including the use of an antibiotic order form for indications, frequency, and duration of administration. In addition, automatic stop orders limiting courses to 24 to 48 hours of prophylaxis, 7 to 10 days of specific therapy, and 24 to 48 hours of empirical therapy might be effective. In neutropenic patients, because of the high proportion of febrile episodes without culture documentation, the authors also suggest that discontinuing antibiotics after a total of 5 to 7 afebrile days in clinically well patients could be beneficial and safe.

FROM: Ena J, Dick RW, Jones RN, Wenzel RP. The epidemiology of intravenous vancomycin usage in a university hospital: a 10-year study. *JAMA* 1993;269:598-602.