

the VRE case-patients and the vancomycin-susceptible enterococcal control-patients, but case-patients had higher Acute Physiology and Chronic Health Evaluation II scores and received significantly greater numbers of antimicrobials and significantly more days of antimicrobials during the 60 days preceding the first positive enterococcal culture. In an assessment of the appropriateness of vancomycin use, one third of vancomycin orders were found to be inappropriate in both patient groups.

The authors concluded that that among renal patients, those who are severely ill and receive multiple and prolonged courses of antimicrobials are at greatest risk for acquiring VRE infection or colonization.

FROM: Beltrami EM, Singer DA, Fish L, Manning K, Young S, Banerjee SN, et al. Risk factors for acquisition of vancomycin-resistant enterococci among patients on a renal ward during a community hospital outbreak. *Am J Infect Control* 2000;28:282-285.

Bacterial Colonization of Toys in Neonatal Intensive Care Cots

Davies and coinvestigators from the Royal Women's Hospital, Melbourne, Australia, conducted a study to investigate which bacteria and fungi contaminated toys in neonatal ICU (NICU) cots. A cross-sectional, longitudinal, bacteriologic survey was conducted of all toys in the cots of infants in an NICU. Cultures of toys were obtained weekly for 4 weeks. Data were collected on the infant's postnatal age, the type of cot, whether humidity was added, characteristics of the toy, and any infant infections.

Over the 4-week period, there were 86 cultures from 34 toys of 19 infants. Bacteria were grown from 84 (98%) of 86 cultures: 84 grew coagulase-negative staphylococci; 50, *Micrococcus* species; 21, *Bacillus* species; 13, methicillin-resistant *Staphylococcus aureus*; 12, diphtheroids; 4, group B streptococcus; 3, *S. aureus*; 3, nonhemolytic streptococci; 3, group D streptococci; 4, alpha-hemolytic streptococci; and 2, coliforms. None grew fungi. The colonization rate did not differ with cot type, presence of humidity, size of the toy, toy fiber length, or the fluffiness score. Eight (42%) of the infants had positive blood culture results, and 5 (63%) of the 8 isolates were of the same type as that colonizing their corresponding toy.

The authors point out that, with time, all the toys in NICU cots became colonized with bacteria. Many were potentially pathogenic. Toys may be reservoirs for potential infantile nosocomial sepsis.

FROM: Davies MW, Mehr S, Garland ST, Morley CJ. Bacterial colonization of toys in neonatal intensive care cots. *Pediatrics* 2000;106:E18.

Prolonged Viremia With Hepatitis A Virus Infection

Researchers from the CDC recently reported on the results of a study to determine the duration of viremia in

hepatitis A virus (HAV) infection and the onset of IgM antibodies to HAV. The duration of viremia and time course for development of IgM antibodies were determined prospectively in natural and experimental HAV infection. Serial serum samples from 13 HAV-infected men and 5 experimentally infected chimpanzees were examined by nested reverse-transcriptase polymerase chain reaction analysis to detect HAV RNA and by enzyme-linked immunosorbent assay to detect IgM antibodies to HAV. Among infected humans, HAV RNA was detected an average of 17 days before the alanine aminotransferase peak, and viremia persisted for an average of 79 days after the liver enzyme peak. The average duration of viremia was 95 (range, 36-391) days. Results were similar in chimpanzees. In addition, HAV RNA was detected in serum of humans and chimpanzees several days before IgM antibodies to HAV were detected. These results indicate that adults with HAV infection are viremic for as long as 30 days before the onset of symptoms and that the duration of viremia may be longer than previously described.

The authors note that these findings have important implications for the transmission of HAV infection through blood products. Blood collected before the onset of symptoms appears to be at highest potential risk of transmitting HAV infection because of the high concentration of virus and essentially no antibody.

FROM: Bower WA, Nainan OV, Han X, Margolis HS. Duration of viremia in hepatitis A virus infection. *J Infect Dis* 2000;182:12-17.

Hepatitis B Outbreak Linked to Autohemotherapy

Webster and colleagues recently reported on a look-back investigation conducted among patients who received treatment at an autohemotherapy clinic in London following diagnosis of acute hepatitis B virus (HBV) infection in a patient who had recently been treated at the clinic. The HBV outbreak investigation was led by the local public health authority and the Public Health Laboratory Service Communicable Disease Surveillance Centre, who identified 399 patients attending the clinic between January 1997 and September 1998. Autohemotherapy is available in alternative medicine clinics worldwide; patients seek treatment for a variety of ailments, including allergies, malignancy, viral hepatitis, and herpes zoster. The autohemotherapy procedure involved drawing approximately 1 mL of the patient's blood with a needle and syringe, mixing the blood with an equal volume of saline, and injecting the mixture into the buttocks or acupuncture points.

Transmission of HBV was linked to a multiuse vial of saline that was drawn from after each venipuncture with the syringe containing the patient's blood. The authors state that the point source of infection in this outbreak could not be unequivocally identified, but one of five patients who were classified as having chronic HBV infection was regarded as the likely source of the infec-

tion. The index case was a 43-year-old woman in whom acute icteric hepatitis B developed approximately 4 months after treatment at an autohemotherapy clinic in October and November 1997. Following the initiation of case-finding procedures, additional hepatitis B surface antigen (HBsAg)-positive cases were identified, as well as one case of hepatitis C virus (HCV) seroconversion.

Both HBV and HCV serological testing were performed on serum samples from identified patients and clinic staff. Patients provided the dates that they received autohemotherapy by completing a questionnaire. Serum samples from 352 of the 399 patients were tested for markers of HBV and HCV infection. Among the 352 patients, 54 (15%) had evidence of HBV infection, 23 had markers of resolved infection, and 31 had evidence of active HBV infection on initial testing. Among the patients who had evidence of resolved HBV infection, 6 had a recently resolved infection. HBV DNA could be amplified and sequenced from 32 of the 33 HBsAg-positive patients and staff members. Complete nucleotide identity in both the surface and core genes was demonstrated in 30 of the 32 cases sequenced; the outbreak-associated HBV belonged to genotype D. The proportion of patients with markers of HBV infection increased with the number of treatments received (chi-square=18, $P<.0001$). The attack rate also was associated with the week of visit ($P=.011$).

Five of the 352 patients had positive test results for antibodies against HCV, including the index case. The only known risk factor for HCV infection in the index case was autohemotherapy. The 4 other patients had chronic HCV infection before they attended the clinic. However, HCV genotype testing results were unique for each of the 5 patients. Antibodies against hepatitis delta virus were negative in all patients.

Fifty household contacts and sexual partners of patients exposed to HBV also were tested; 24 contacts of patients with active HBV infection were vaccinated. Acute icteric hepatitis developed in 1 sexual contact; analysis revealed that she and her partner had HBV strains of the same genotype.

Four family members, one of whom was a registered physician, staffed the clinic. Acute HBV developed in two of the four in March 1998; one tested positive for antibodies against HCV but negative for HCV RNA. Results in the third showed resolved HBV and tested positive for antibodies against HCV but negative for HCV RNA. The fourth had no markers for HBV or HCV infection. The four people involved had performed autohemotherapy on each other during the previous year.

FROM: Webster GJM, Hallet R, Whalley SA, Meltzer M, Balogun K, Brown D, et al. Molecular epidemiology of a large outbreak of hepatitis B linked to autohaemotherapy. *Lancet* 2000;356:379-384.

Hematological Changes in Workers From Ethylene Oxide Exposure

Shaham and colleagues from the Occupational Cancer Department, National Institute of Occupational and Environmental Health, Tel-Aviv University, Raanana, Israel, conducted a cross-sectional study to determine whether occupational exposure to low levels of ethylene oxide can cause hematological abnormalities. Blood samples were collected from a group of 47 hospital workers who were exposed to ethylene oxide during a mean period of 6.6 years (standard error, 1.1). Ethylene oxide range levels measured were <0.01 to 0.06 ppm. The control group, individually matched by age, gender, and smoking habits, consisted of 88 workers from the administrative sector.

They found significant differences between the exposed and control groups in the frequency of workers with white blood cells lower than the normal range. Although there was no significant difference in the absolute mean number of the total white blood cells, they found an elevation in the absolute mean number of monocytes and eosinophils ($P<.01$) and a decrease ($P<.01$) in the absolute mean number of lymphocytes in the exposed group compared with the control group. They also found an elevation ($P<.01$) in the percentage of hematocrit and the mean absolute number of the red blood cells, and a decrease ($P<.01$) in the mean absolute number of platelets in the exposed group compared with the control group. The mean absolute number of eosinophils, red blood cells, and percentage of hematocrit was significantly higher, and the mean absolute number of lymphocytes and platelets was significantly lower in the subgroups with a higher cumulative dose of exposure. A positive dose-response was found between cumulative dose exposure and the absolute mean number of eosinophils.

The authors suggest that the use of complete blood cells with differential in routine medical surveillance and for early detection of hygiene problems should be reexamined with special attention to the eosinophils count.

FROM: Shaham J, Levi Z, Gurvich R, Shain R, Ribak J. Hematological changes in hospital workers due to chronic exposure to low levels of ethylene oxide. *J Occup Environ Med* 2000;42:843-850.