Medical News

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An Outbreak of Hepatitis B and C Virus Infections in a Pediatric Oncology Ward

Dumpis and colleagues from the University of Latvia, Riga, Latvia, performed an outbreak investigation of hepatitis B and C virus infections. One hundred six patients were infected in a hematology–oncology ward for children during 1996 to 2000. Serum samples from 45 such patients and 3 from infected medical personnel were used for nucleic acid amplification. Hepatitis B virus core as well as hepatitis C virus core and hypervariable region 1 (HVR1) nucleotide sequences underwent phylogenetic tree analysis to characterize the epidemiologic pattern of viral transmission on the ward.

Samples from 32 patients were positive for hepatitis B virus DNA or hepatitis C virus RNA by polymerase chain reaction. Ten patients were positive for both markers. Seventeen of 23 hepatitis C virus core gene sequences were found to be evolutionarily related and clustered separately from other local sequences in the phylogenetic tree, indicating nosocomial transmission. This was confirmed by analysis of HVR1 gene sequences. One nurse and one physician from the ward were hepatitis C virus RNA positive, but their hepatitis C virus sequences were not related evolutionarily to those of the patient cluster. Fifteen of 19 hepatitis B virus core gene sequences were also clustered together and were positioned separately in the relevant tree. An epidemiologic investigation excluded a common source for infection and indicated that spread of infection was most likely due to inappropriate infection control measures on the ward. No obvious risk factors for transmission were identified during the retrospective survey in patients with related sequences, except the use of multidose vials for saline and poor staff compliance with routine hand hygiene procedures.

The preventive measures that were introduced reduced the incidence of infection significantly. No new cases of hepatitis B virus infection and only 3 anti–hepatitis C virus seroconversions occurred during 19 months. The introduction and maintenance of strict prevention measures during 2 years, combined with hepatitis B virus vaccination, significantly reduced the incidence of new hepatitis C and hepatitis B virus infections.

FROM: Dumpis U, Kovalova Z, Jansons J, et al. An outbreak of HBV and HCV infection in a paediatric oncology ward: epidemiological investigations and prevention of further spread. *J Med Virol* 2003;69:331-338.

Prevalence of Vancomycin-Resistant Enterococci in Response to Antimicrobial Interventions

Lautenbach and colleagues from the University of Pennsylvania School of Medicine, Philadelphia, conducted a study to assess the impact of restricting the use of vancomycin and third-generation cephalosporins on the prevalence of vancomycin-resistant enterococci (VRE). All clinical enterococcal isolates identified at a large academic medical center during a 10-year period were analyzed. Changes in the prevalence of VRE after sequential restrictions on the use of vancomycin and third-generation cephalosporins were evaluated. The correlation between antibiotic use and VRE prevalence was also investigated. The use of vancomycin initially decreased by 23.9% but returned to preintervention levels by the end of the study. The use of third-generation cephalosporins decreased by 85.8%. However, the prevalence of VRE increased steadily from 17.4% to 29.6% during the 10-year period ($P < .001$). The use of clindamycin was significantly correlated with the prevalence of VRE. Restricting the use of vancomycin and third-generation cephalosporins had little impact on the prevalence of VRE. The association between the use of clindamycin and the prevalence of VRE suggests that restriction of this and perhaps other antianaerobic agents might be an important component of future antimicrobial interventions.

FROM: Lautenbach E, LaRosa LA, Marr AM, Nachamkin I, Bilker WB, Fishman NO. Changes in the prevalence of vancomycin-resistant enterococci in response to antimicrobial formulary interventions: impact of progressive restrictions on use of vancomycin and third-generation cephalosporins. *Clin Infect Dis* 2003;36:440-446.

Clinical and Economic Outcomes Attributable to Methicillin-Resistant *Staphylococcus aureus* Surgical-Site Infections

Engemann and colleagues from Duke University Medical Center, Durham, North Carolina, analyzed data from 479 patients to assess the impact of methicillin resistance on the outcomes of patients with *Staphylococcus aureus* surgical-site infections (SSIs). Patients infected with methicillin-resistant *S. aureus* (MRSA) had a greater 90-day mortality rate than did patients infected with methicillin-susceptible *S. aureus* (MSSA; adjusted odds ratio, 3.4; 95% confidence interval, 1.5 to 7.2). Patients infected with MRSA had a greater duration of hospitalization after infection (median additional days, 5; $P < .001$), although this was not significant on multivariate analysis ($P = .11$). Median hospital charges were $29,455 for control subjects, $52,791 for patients with MSSA SSI, and $92,363 for patients with MRSA SSI ($P < .001$ for all group comparisons). Patients with MRSA SSIs had a 1.19-fold increase in hospital charges ($P = .03$) and had mean attributable excess charges

of $13,901 per SSI compared with patients who had MSSA SSIs. The authors concluded that methicillin resistance is independently associated with increased mortality and hospital charges among patients with *S. aureus* SSI.

FROM: Engemann JJ, Carmeli Y, Cosgrove SE, et al. Adverse clinical and economic outcomes attributable to methicillin resistance among patients with *Staphylococcus aureus* surgical site infection. *Clin Infect Dis* 2003;36:592-598.

Laparoscopic Cholecystectomy and the Risk of Surgical-Site Infection

Richards and colleagues from the National Nosocomial Infections Surveillance (NNIS) System of the Centers for Disease Control and Prevention conducted a study to assess the impact of laparoscopy on surgical-site infections (SSIs) following cholecystectomy in a large population of patients. Previous investigations have demonstrated that laparoscopic cholecystectomy is associated with a shorter postoperative stay and fewer overall complications. Less is known about the impact of laparoscopy on the risk for SSIs.

An epidemiologic analysis was performed on data collected during a 7-year period (1992 to 1999) by hospitals participating in the NNIS System. For 54,504 inpatient cholecystectomy procedures reported, use of the laparoscopic technique increased from 59% in 1992 to 79% in 1999. The overall rate of SSI was significantly lower for laparoscopic cholecystectomy than for open cholecystectomy. Overall, infecting organisms were similar for both approaches. Even after other significant factors were controlled, the risk for SSI was lower in patients undergoing the laparoscopic technique than in those undergoing the open technique.

The authors concluded that laparoscopic cholecystectomy is associated with a lower risk for SSI than is open cholecystectomy, even after adjusting for other risk factors. For interhospital comparisons, SSI rates following cholecystectomy should be stratified by the type of technique.

FROM: Richards C, Edwards J, Culver D, Emori TG, Tolson J, Gaynes R. Does using a laparoscopic approach to cholecystectomy decrease the risk of surgical site infection? *Ann Surg* 2003;237:358-362.

Blood Culture Contamination: Dedicated Phlebotomy Versus Intravenous Catheter

Blood culture is the criterion standard for identifying children with bacteremia. However, elevated false-positive rates are common and are associated with substantial healthcare costs.

Norberg and colleagues recently compared contamination rates in blood culture specimens obtained from separate sites versus through newly inserted intravenous catheters in an observational study conducted from January 1998 through December 1999. Patients included those 18 years or younger who were seen in a U.S. children's hospital emergency department and had a blood culture performed as part of their care. Medical records were reviewed for all cases with a positive blood culture. Patients with indwelling vascular catheters were excluded.

Phlebotomy was performed by registered nurses of the emergency department. During the baseline phase, blood specimens for culture were obtained simultaneously with intravenous catheter insertion. During the postintervention phase, specimens were obtained by a separate, dedicated procedure. The contamination rate in the postintervention period was compared with that in the baseline period.

A total of 4,108 blood cultures were evaluated, including 2,108 during the baseline phase and 2,000 in the postintervention phase. The false-positive blood culture rate decreased from 9.1% to 2.8% ($P < .001$). A statistical process control chart demonstrated a steady-state process in the baseline phase and the establishment of a significantly improved steady state in the postintervention phase. Young age was associated with an increased contamination rate in both the baseline and the postintervention periods.

The authors concluded that blood culture contamination rates were lower when specimens were drawn from a separate site compared with when they were drawn through a newly inserted intravenous catheter.

FROM: Norberg A, Christopher NC, Ramundo ML, Bower JR, Berman SA. Contamination rates of blood cultures obtained by dedicated phlebotomy vs intravenous catheter. *JAMA* 2003;289:726-729.