22. Larson E. Guideline for use of topical antimicrobial agents. *Am J Infect Control* 1988;16:253-266.
23. Maki DG, Ringer M, Alvarado CJ. Prospective randomized trial of povidone-iodine, alcohol, and chlorhexidine for prevention of infection associated with central venous and arterial catheters. *Lancet* 1991;338:339-343.
24. MacMillan S. Could you please comment regarding the use of iodine alcohol, 70% isopropyl alcohol and tincture of chlorhexidine in cleaning of silicone central venous catheter insertion sites and hubs. *Can J Infect Control* 1993;8:81.
25. Stotter AT, Ward H, Waterfield AH, Hilton J, Sim AJW. Junctional care: the key to prevention of catheter sepsis in intravenous feeding. *Journal of Parenteral and Enteral Nutrition* 1987;11:159-162.
26. Sitges-Serra A, Linares J, Garau J. Catheter sepsis: the clue is in the hub. *Surgery* 1985;97:355-357.
27. Sitges-Serra A, Linares J, Perez JL, Juarrieta E, Lorente L. A randomized trial on the effect of tubing changes on hub contamination and catheter sepsis during parenteral nutrition. *Journal of Parenteral and Enteral Nutrition* 1985;9:322-325.
28. Jansen B, Jansen S, Peters G, Pulverer G. In-vitro efficacy of a central venous catheter ('Hydrocath') loaded with teicoplanin to prevent bacterial colonization. *J Hosp Infect* 1992;22:93-107.
29. Maki DG, Cobb L, Garman JK, Shapiro JM, Ringer M, Helgerson RB. An attachable silver-impregnated cuff for prevention of infection with central venous catheters: a prospective randomized multicenter trial. *Am J Med* 1988;85:307-314.
30. Bentivegna PE. The Vitacuff and intravascular catheter-related infection. *JAMA* 1989;262:613-614.
31. Schwartz C, Henrickson KJ, Roghmann K, Powell K. Prevention of bacteremia attributed to luminal colonization of tunneled central venous catheters with vancomycin-susceptible organisms. *J Clin Oncol* 1990;8:1591-1597.
32. Ranson M, Oppenheim BA, Jackson A, Kamthan AG, Scarffe JH. Double-blind placebo controlled study of vancomycin prophylaxis for central venous catheter insertion in cancer patients. *J Hosp Infect* 1990;15:95-102.
33. Gaillard JL, Merlino R, Pajot N, et al. Conventional and nonconventional modes of vancomycin administration to decontaminate the internal surface of catheters colonized with coagulase-negative staphylococci. *Journal of Parenteral and Enteral Nutrition* 1990;14:593-597.
34. Howe D, Anderson R, Muhvic J, Craft T. Subcutaneous venous access device: is maintenance flushing necessary? *Proceedings of the American Society of Clinical Oncology* 1991;10:333.

HCV in Tissue Culture: Yet Another Confounder

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Hepatitis C virus (HCV) is a very important human pathogen that causes chronic liver disease in a substantial number of infected individuals worldwide. Dr. Robert Purcell, who has headed the NIH's activities on hepatitis viruses, quite often with spectacular success, has been on the leading edge attempting to devise techniques for the cultivation of HCV in tissue culture. Dr. M. Yanagi and co-investigators of his group report on an interesting twist on attempts to grow HCV. This virus has had a long history of reports on such a low level of replication that reverse transcription-polymerase chain reaction (RT-PCR) assays are required for detection.

In a study to refine the cultivation process, the authors discovered yet another complication. When performing the RT-PCR assay with primers deduced from conserved domains of the five prime noncoding regions of HCV, they found appropriately sized cDNA. However, subsequent analysis revealed that the cDNA detected and thought to be associated with HCV was in fact amplified from bovine viral diarrhea virus (BVDV) sequences, which were contained in the lots of commercially available fetal bovine serum (FBS) used in the tissue culture medium. Six lots of commercially available FBS and one lot of newborn calf serum from three major suppliers in the United States were tested. All were contaminated with BVDV.

The authors recommend that, although there is no evidence of infectious virus being present, bovine sera used in HCV tests or for production of vaccine should be screened for BVDV by RT-PCR.

FROM: Yanagi M, Bukh J, Emerson S, Purcell R. Contamination of commercially available fetal bovine sera with bovine viral diarrhea virus genomes: implications for the study of hepatitis C virus in cell cultures. *J Infect Dis* 1996;174:1324-1327.