Wright PJ, et al. Hospital outbreak of Norwalk-like virus. Infect Control Hosp Epidemiol 1997;18:576-579.

- Cáceres VM, Kim DK, Bresee JS, Horan J, Noel JS, Ando T, et al. A viral gastroenteritis outbreak associated with person-to-person spread among hospital staff. *Infect Control Hosp Epidemiol* 1998;19:162-167.
- 17. Kilgore PE, Belay ED, Hamlin DM, Noel JS, Humphrey CD, Gary HE Jr, et al. A university outbreak of gastroenteritis due to a small round-structured virus. Application of molecular diagnostics to identify the etiologic agent and patterns of transmission. J Infect Dis 1996;173:787-793.
- McAnulty JM, Rubin GL, Carvan CT, Huntley EJ, Grohmann G, Hunter R. An outbreak of Norwalk-like gastroenteritis associated with contaminated drinking water at a caravan park. Aust J Public Health 1993;17:3641.
- Reid JA, Caul EO, White DG, Palmer SR. Role of infected food handler in hotel outbreak of Norwalk-like viral gastroenteritis: implications for control. *Lancet* 1988;2:321-323.
- Ho MS, Glass RI, Monroe SS, Madore HP, Stine S. Viral gastroenteritis aboard a cruise ship. *Lancet* 1989;2:961-965.
- Khan AS, Moe CL, Glass RI, Monroe SS, Estes MK, Chapman LE, et al. Norwalk virus-associated gastroenteritis traced to ice consumption aboard a cruise ship in Hawaii: comparison and application of molecular method-based assays. J Clin Microbiol 1994;32:318-322.
- McEvoy M, Blake W, Brown D, Green J, Cartwright R. An outbreak of viral gastroenteritis on a cruise ship. Commun Dis Rep CDR Rev 1996;6:R188-R192.
- Kaplan JE. An outbreak of acute nonbacterial gastroenteritis in a nursing home. Am J Epidemiol 1982;116:940-948.
- Heun EM, Vogt RL, Hudson PJ, Parren S, Gary GW. Risk factors for secondary transmission in households after a common-source outbreak of Norwalk gastroenteritis. Am J Epidemiol 1987;126:1181-1186.
- 25. Ando T, Monroe SS, Gentsch JR, Jin Q, Lewis DC, Glass RI. Detection and differentiation of antigenically distinct small round-structured viruses (Norwalk-like viruses) by reverse transcription-PCR and Southern hybridization. J Clin Microbiol 1995;33:64-71.

- Ando T, Jin Q, Gentsch JR, et al. Epidemiologic applications of novel molecular methods to detect and differentiate small round-structured viruses (Norwalk-like viruses). J Med Virol 1995;47:147-152.
- Centers for Disease Control. Recommendations for collection of laboratory specimens associated with outbreaks of gastroenteritis. MMWR 1990;39:RR-14.
- 28. Noel JS, Ando T, Leite JP, Green KY, Dingle KE, Estes MK, et al. Correlation of patient immune responses with genetically characterized small round-structured viruses involved in outbreaks of nonbacterial acute gastroenteritis in the United States, 1990 to 1995. J Med Virol 1997;53:372-383.
- 29. Walter SD. On the detection of household aggregation of disease. Biometrics 1974;30:525-538.
- 30. Sawyer LA, Murphy JJ, Kaplan JE, Pinsky PF, Chacon D, Walmsley S, et al. 25- to 30-nm virus particle associated with a hospital outbreak of acute gastroenteritis with evidence for airborne transmission. Am J Epidemiol 1988;127:1261-1271.
- Chadwick PR, McCann R. Transmission of a small round structured virus by vomiting during a hospital outbreak of gastroenteritis. J Hosp Infect 1994;26:251-259.
- 32. Graham DY, Jiang X, Tanaka T, Opekun AR, Madore HP, Estes MK. Norwalk virus infection of volunteers: new insights based on improved assays. J Infect Dis 1994;170:34-43.
- Okhuysen PC, Jiang X, Ye L, Johnson PC, Estes MK. Viral shedding and fecal IgA response after Norwalk virus infection. J Infect Dis 1995;171:566-569.
- 34. Noel JS, Fankhauser RL, Ando T, Monroe S, Glass RI. Identification of a distinct common strain of Norwalk-like viruses (NLVs) having a global distribution. *J Infect Dis.* In press.
- LeBaron CW, Furutan NP, Lew JF, Gouvea V, Moe C, Allen JR, et al. Viral agents of gastroenteritis-public health importance and outbreak management. MMWR 1990;39 (RR-5):1-24.

Rising Incidence of Hepatocellular Carcinoma in the United States

Gina Pugliese, RN, MS Martin S. Favero, PhD

Between 1976 and 1980, the incidence of histologically proved hepatocellular carcinoma rose from 1.4 per 100,000 persons to 2.4 per 100,000 persons during 1991 and 1995. The rate among African American men was 6.1 per 100,000 for the 1991 to 1995 period and 2.8 per 100,000 among white men. During the time frame studied, the mortality rate from primary liver cancer increased by 41%, while the number of hospitalizations pertaining to the condition increased 46%. Two likely factors behind the increase are hepatitis B virus (HBV) and hepatitis C virus (HCV) infection, since a third risk factor—alcoholic cirrhosis—is on the decline. Because there is a long latency period for persons infected with HBV or HCV, individuals who were infected during the 1960s and 1970s—a time when injection drug use, needle sharing, transfusion of unscreened blood, and unsafe sex were prevalent—could develop hepatocellular carcinoma during the 1980s and 1990s.

Globally, the rate of hepatocellular carcinomas is comparable to the geographic prevalence of chronic carriers of HBV. In Southeast Asia and sub-Saharan Africa, nearly 10% to 25% of the population is infected, and the risk of hepatocellular carcinoma increases by a factor of 100 when there is persistent HBV infection. Chronic HCV also is a risk factor for hepatocellular carcinoma.

FROM: El-Serag HB, Mason AC. Rising incidence of hepatocellular carcinoma in the United States. *N Engl J Med* 1999;340:745-746.

Ince N, Wands JR. The increasing incidence of hepatocellular carcinoma. *N Engl J Med* 1999;340:798.