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## Hepatitis B and D Virus Infection—A Deadly Combination

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The pattern of hepatitis D virus (HDV) infection and disease varies considerably worldwide. HDV can infect only persons who are coinfecting or superinfected with the hepatitis B virus (HBV). In developed countries, the rate of HDV infection generally is low, and the severity of disease ranges from moderate to severe. In contrast, HDV infection has been associated commonly with outbreaks of severe and frequently fatal fulminant hepatitis in northern South America for at least 50 years. HDV infection was associated with mortality as high as 70% among acutely jaundiced patients during several out-

breaks in Venezuela and Colombia, and HDV is endemic in parts of Brazil and jungle areas of Peru. Recurring outbreaks of acute hepatitis have been an important cause of morbidity and mortality among Peruvian military personnel stationed in the Amazon Basin region of Peru.

Studies were performed to determine the role of HBV and HDV infection as the cause of acute hepatitis among 88 military patients stationed at four different jungle outposts during 1992 to 1993. Analysis of serum markers indicated that 95% (84/88) had evidence of acute HBV infection; 64% (54/84) also were infected with HDV. Genetic analysis of polymerase chain reaction-amplified HDV and HBV fragments

showed exclusively HDV genotype III and HBV genotype F. Furthermore, HDV RNA sequences were similar among patients from the same outposts, but different from those at other jungle locations. These results suggest focal sources of HDV infection in the jungle environment of the outposts and further confirmed the unique association of HDV genotype III with severe cases of human disease in northern South America.

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