

Simultaneous Infection with Hepatitis A Virus
(HAV) and Hepatitis B Virus (HBV)

Principal Investigators : Donald S. Burke, MAJ, MC
Rapin Snitbhan, M.D.

Assistant Investigators : Choompun Manomuth, B.Sc
Sumitda Narupiti, B.Sc
Pranom Vangnai, R.N.

OBJECTIVE : To identify and describe the laboratory findings in cases of acute hepatitis in which there is evidence for simultaneous infection with HAV and HBV.

BACKGROUND : Both HAV and HBV are endemic in Bangkok. Essentially 100% of native Thais of all age groups are carriers of HBV and an additional 50% of antigen-negative adults have anti-HBs.

On the basis of these facts, we reasoned that dual infections with both HAV and HBV are probably not unusual in Bangkok. As most research work in HAV has been conducted in developed countries where incidence rates of hepatitis are much lower than in Bangkok, human cases of simultaneous infection have been infrequently reported (1). In the laboratory, an experimental chimpanzee which was reported to have had an inadvertent infection with both viruses, developed an unusually severe illness (2). In the course of our preliminary acute hepatitis protocol, we tested serum specimens from patients for evidence of infection with HAV and/or HBV.

Overall results are presented elsewhere in this Annual Report. Ten cases were found with suggestive evidence of simultaneous HAV and HBV infection; reported here are five well documented cases.

METHODS : Acute sera from 223 patients with acute hepatitis were screened for evidence of anti-HAV IgM by the staph absorption modification of the HAVAB (R) solid phase competition radioimmunoassay (SA-CBAM). Acute and convalescent sera were screened for HBsAg by CIEOP and SPRIA (AUSRIA-II (R)) and for anti-HBs by CIEOP and SPRIA (AUSAB (R)). Acute and convalescent serum specimens from patients that showed evidence of recent or current infection with both HAV and HBV were further analyzed by sucrose density gradient fractionation. IgM positive fractions for each specimen were pooled and dialyzed against PBS as were IgG positive fractions. After centrifugation and dialysis, immunoglobulins were at a 1:4 dilution of their original serum concentration. Each fraction pool was then run in the HAVAB (R) SPRIA with or without 2-mercaptoethanol (2-ME) at a final concentration of 0.1 M. To be included in this series each case required, as a minimum, the following laboratory proof of diagnosis :

DIAGNOSIS

REQUIREMENT

Acute HAV

1. SA-CBAM assay positive on acute serum
and
2. 19S fraction of acute serum shows 2-ME labile activity in HAVAB.

HBV

1. HBsAg (AUSRIA-II) positive in acute serum
and
2. Anti-HBs (AUSAB) or HBsAg (AUSRIA-II) positive in convalescent serum.

RESULTS : Laboratory tests done to establish evidence of concurrent infection with HAV and HBV are presented in Table 1. Of the five cases, three appear to have occurred in chronic HBs carriers, while in two cases acute infection occurred simultaneously with both viruses. The clinical histories as recorded on the protocol questionnaire forms of these five patients were not extraordinary. None of the patients died, and none had evidence of pre-coma. Further details have been requested from the attending physicians.

REFERENCES :

1. Hindman, S.H., Maynard, J.E., Bradley, D.W., Berquist, K.R., Denes, A.E.: Simultaneous Infection with Type A and B Hepatitis Viruses. Amer. J. Epidem. 105:135-139, 1977.
2. Drucker, J., Tabor, E., Gerety, R.J., Jackson, D., Barker, L.F.: Simultaneous Acute Infections with Hepatitis A and Hepatitis B Viruses in a Chimpanzee. J. Infect. Dis. 139:338-42, 1979.
3. Burke, D.S., Snitbhan, R.: Determination of the Etiology of Acute Hepatitis Infections in Bangkok: A Pilot Study AFRIMS Annual Progress Report October 1978 to September 1979.