

An Assessment of the Reverse Passive Hemagglutination as a Method for the Detection of Hepatitis B Surface Antigen

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OBJECTIVE : To evaluate the sensitivity of the reverse passive hemagglutination (RPHA) test for the detection of hepatitis B surface antigen (HB_s Ag).

BACKGROUND : According to recent evidence, a relationship may exist between hepatitis B virus (HBV) infection and chronic or malignant liver disease. Identification of the markers of HBV infections, therefore, become increasingly important. The RPHA test is reported to be a sensitive and simple method for detection of HB_s Ag in serum.

METHODS : Comparative HB Ag assays performed on sera collected from an asymptomatic Thai population employed the RPHA, immunoelectroosmophoresis (IEOP) and the radioimmune assay (AUSRIA-2), Abbott Laboratories, North Chicago, Ill.). A subsequent study was conducted on sera that had been shown to contain HB Ag by AUSRIA-2. The RPHA test were obtained from commercial sources (Organon Co.) under the trade name of Hepanosticon.

RESULTS : HB Ag was detected in 13 of 100 sera by the AUSRIA-2 but was found in only five of 100 by the RPHA or the IEOP tests (Table 1). Of the 12 sera that were HB Ag positive by AUSRIA-2, only two were shown to contain HB_s Ag by the RPHA test (Table 2).

On the basis of the sensitivity, specificity, economics, time and reagent stability of the three tests, the IEOP assay appeared the most useful for initial screening of sera for HB Ag (Table 3). Confirmation of identity of antigen, however, must rely on the AUSRIA-2 test.

Table 1. Comparison of Three Tests for HB_s Ag Results of 100 Sera

Test	Pattern of Positive Results		Sera Positive for Each Test
AUSRIA-2 ^a	X	X	13
RPHA ^b	X		5
IEOP ^c	X		5
Total sera positive by tests indicated	5	8	13

- ^a Radioimmune assay confirmed by neutralization
^b Reverse passive hemagglutination
^c Immunoelectrophoresis

Table 2. Sensitivity of RPHA for Detection of HB_s Ag in Twelve Sera Positive by RIA Only

Test	Pattern of Positive Results		Sera Positive for Each Test
AUSRIA-2 ^a	X	X	12
RPHA ^b	X		2
Total sera positive by test indicated	2	10	12

- ^a Radioimmunoassay confirmed by neutralization
^b Reverse passive hemagglutination

Table 3. Comparative Assessment of Different Test for Detecting HB_sAg

	IEOP	RPHA	RIA
Sensitivity	Adequate	Better	Best
Initial costs	Moderate	Low	Very high
Cost per test	Low	High	High
Time per test	2 hours	3 hours	5 hours
Reagent stability	Indefinite	6 months	30 days