

## Familial Clustering of Hepatitis B Surface Antigen among Panamanian Indians

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Several authors have suggested that the host genome determines the occurrence of chronic HB<sub>s</sub> Ag (hepatitis B surface antigen). In attempts to evaluate this possibility, total infection rate and the combined frequencies of HB<sub>s</sub> Ag and antibody to HB<sub>s</sub> Ag in the population have not been analyzed. Using counterelectrophoresis to assay HB<sub>s</sub> Ag and radioimmunoprecipitation to measure antibody to HB<sub>s</sub> Ag, we tested sera from 255 Panamanian Guaymi Indians. They represented 48 families and 32 living units. Clusters of chronically antigenemic individuals were found in families. Clusters of infection were not found in families or living units. Differences in family composition (age and sex) did not explain the increased occurrence of HB<sub>s</sub> Ag. These findings support the hypothesis that some humans have an inherited susceptibility to chronic infection with hepatitis B virus after exposure.

Hepatitis B surface antigen (HB<sub>s</sub> Ag) was initially regarded as a polymorphic serum antigen. Before suggesting that this antigen was related to hepatitis, Blumberg et al. [1] demonstrated an increased frequency of antigenemia in certain families. Their later studies [2] showed familial clustering of HB<sub>s</sub> Ag in a pattern consistent with monofactorial autosomal recessive inheritance. Subsequently, Carbonara et al. [3] published similar findings from Sardinia.

At the time of these genetic studies, no sensitive tests existed for the measurement of antibodies to HB<sub>s</sub> Ag (anti-HB<sub>s</sub>). Although HB<sub>s</sub> Ag

clustered in families, it was not determined whether host genome or increased exposure within index families was the cause. In a recent study by Szmuness et al. [4] among family contacts of chronically antigenemic blood donors in New York, it was suggested that both environmental and genetic factors contributed to hepatitis B infections. Similar studies have not been reported from primitive populations. In this paper we report on studies on the frequencies of HB<sub>s</sub> Ag and anti-HB<sub>s</sub> among families of Panamanian Guaymi Indians.

### Materials and Methods

*Population groups.* In 1970 and 1971 we conducted a survey to study HB<sub>s</sub> Ag and anti-HB<sub>s</sub> in sera of members of the three Indian tribes in Panama [5]. The highest frequency of HB<sub>s</sub> Ag was among the Guaymi Indians, who live in the Pacific coastal mountains. During the survey we obtained village cooperation by establishing medical clinics to administer measles vaccine and to provide medical care. Blood was drawn from those attending the clinic. We recorded each subject's name, age, sex, and dwelling site as well as

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