

Serum immunoglobulin levels in Cabécar and Guaymí Indians in Southeastern Costa Rica

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Resumen: En un grupo de treinta y cuatro indígenas de varias localidades de los grupos Cabécar y Guaymí, en el sureste de Costa Rica, se determinó los niveles de IgG, IgA e IgM en suero, mediante inmunodifusión radial. Se comparó los resultados con los descritos en un grupo de adultos sanos costarricenses de zonas urbanas. Los niveles de inmunoglobulinas en el grupo de indígenas fueron mayores que los del grupo control.

Several studies indicate that serum immunoglobulin (Ig) levels in healthy individuals may vary significantly among different populations, according to race, age, sex, and environmental conditions. In the present work we have determined the concentrations of IgG, IgA, and IgM in the sera of thirty-four Indians of the Cabécar and Guaymí groups of Costa Rica. These levels have been compared to data published earlier on a group of normal healthy adults from San José, Costa Rica (Lomonte *et al.* 1985).

The sample was composed of thirty-four individuals of both sexes (nine females and twenty-five males) whose age ranged from twelve to fifty-four years, with an average of twenty-five. Of these, twenty-four individuals belonged to the Cabécar population (locations Cuchey, Kueyn, Cavery, Coen, Xiclar-Bata, Jabuy) and ten to the Guaymí population (locations Santa Rosa, Altos del Conte, Río la Vaca, Cabeceras de la Yerba). These groups live deep in the forest of the Southeastern region of Costa Rica (access was by helicopter). The study was conducted in January 1985. Blood samples were taken by venipuncture. After clotting, sera were separated and stored at -30 C until analyzed, while red blood cells were utilized for ABO and Rh(D) typing. Immunoglobulin quantitation was performed by radial immunodiffusion

(Mancini *et al.* 1965) using commercially-available plates and a precision viewer (Hyland Diagnostics, Illinois). All samples were screened by conventional zone electrophoresis on cellulose polyacetate membranes (Helena Laboratories, Beaumont, Texas) to exclude the presence of monoclonal proteins. Also, albumin and total protein were determined by the bromocresol green and biuret methods, respectively. For comparison, total protein and albumin were determined in 30 healthy individuals.

Serum IgG, IgA, and IgM concentrations are summarized in table 1. None of the samples showed monoclonal bands in zone electrophoresis, although eight had a slight increase in the gamma-globulin region. Total serum protein concentration was low in six individuals (18%), while albumin was low in two cases. All of the individuals studied were of the O Rh(+) blood type.

Blood typing results support the racial homogeneity of the sample, since it has been reported that Indian groups of Costa Rica are almost exclusively of the O blood type (Barrantes *et al.* 1982).

Data have been reported indicating elevated serum Ig levels in some indian populations (e.g. Cáceres and Mata, 1974). In the present case, using exactly the same methodology for both groups, serum Ig levels of the Indian group were significantly higher in comparison with urban

TABLE 1

Serum immunoglobulin levels in Indian and urban populations of Costa Rica

Immunoglobulin + (mg/dl)	Cabécar and Guaymí Indians	Control group (urban)*
IgG	1.774 ± 385** (n = 34)	1.495 ± 387 (n = 49)
IgA	284 ± 92** (n = 34)	187 ± 55 (n. 46)
IgM	171 ± 52*** (n = 34)	142 ± 57 (n = 45)

* Lomonte *et al.*, 1985

** P < 0,01

*** P < 0,05

† mean ± standard deviation

population. Whether this difference is due to genetic or environmental factors, or both, is not known.

In a study of a rural Indian community with high rates of infection in the Guatemalan highlands, Cáceres and Mata (1974) found high Ig levels in children, reaching the adult levels of IgG and IgM by the end of the first year of life. It would be of interest to investigate if our Indian population, in which adequate nutritional and health conditions have been described (Barrantes and Mata, 1981), show a similar phenomenon.

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