Serum Immunoglobulins in Gout[1] (34165)

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(Introduced by Howard Elliott)

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Recent studies have demonstrated frequent changes in the serum immunoglobulin levels in patients with rheumatoid arthritis (1–3). Elevation of IgA was the most common observation, with elevations of IgG and IgM noted less often. In contrast, little information is available on the serum immunoglobulin levels associated with other inflammatory joint conditions. This paper presents data showing the occurrence of elevated serum immunoglobulins in patients with primary and secondary gout. The elevation of IgA was the most significant and constant abnormality.

Methods. Immunoglobulin determinations were performed on fresh and frozen sera. None of the frozen sera was more than 6 months old. The various immunoglobulins were quantitated by the radial diffusion technique using commercially available antibody-agar plates (Immuno-Plate, Hyland Laboratories, Los Angeles, Calif.). The wells were filled and the plates were incubated as directed by the manufacturer. Reference standards were run with each series of determinations. The diameters of the precipitin rings were determined by averaging two measurements made at right angles, using a measuring magnifier. Standard curves were prepared as suggested by Allansmith *et al.* (4). Determinations of immunoglobulins done at different dates demonstrated good reproducibility.

The study patients formed two groups: hospitalized patients at the Birmingham Veterans Administration Hospital, and private outpatients. The former group included saturnine gout patients whose hyperuricemia was due to lead-induced chronic nephritis (5). Primary metabolic and other secondary types were also represented. The disease seen in the outpatient group was of the primary type. Acute gouty arthritis had been verified at one time or another in all patients by aspiration of joint fluid and demonstration of urate crystals. The control group, 24 Negroes and 27 whites, included 12 healthy army reservists, 33 healthy staff and employees of the Medical Center, and 6 patients hospitalized for subaortic stenosis, lead nephritis with hyperuricemia but no gout, postgastrectomy syndrome, congestive heart failure, and remote fracture of the femur. None of the control group had histories of allergic manifestations, recent infections, or evidence of connective tissue disease.

Results. Significant elevations of serum IgA ($p = 0.001$) were found in both Negro and white subjects with gout (Table I); the increase in IgG values was of moderate significance ($p = 0.02$) for white subjects only. There were no differences in the immunoglobulin levels between the saturnine and nonsaturnine gout patients (Table II). The relationship between the time of the acute attacks of gout and the determination of serum immunoglobulins was variable. In some instances the samples were obtained concurrent with, or shortly after an attack of gout; in others the sera were obtained as long as 3 months after the last episode of arthritis. No difference was apparent between the levels in sera obtained shortly after attacks of gout and those drawn at a later date. Also, significant differences in the levels of the various immunoglobulins were not apparent upon comparison of elderly and younger gouty subjects.

The white control values (Table I) corre-

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TABLE I. Serum Immunoglobulin Levels in Gouty Subjects and Controls.

Subjects	IgA (mg/100 ml)	IgM (mg/100 ml)	IgG (mg/100 ml)
Gouty patients			
18 Negro	484 ± 162[a] (225–875)[b]	116 ± 80 (38–355)	1715 ± 418 (1125–2650)
7 White	328 ± 77 (260–485)	125 ± 73 (33–360)	1323 ± 163 (970–1500)
Controls			
24 Negro	283 ± 111 (90–570)	76 ± 33 (21–180)	1879 ± 641 (940–3050)
27 White	187 ± 113 (31–450)	81 ± 35 (34–155)	1098 ± 335 (600–2900)

[a] Average and standard deviation.
[b] Range of values.

TABLE II. Comparison of Serum Immunoglobulin Levels in Various Groups of Patients with Gout.

Subjects	IgA (mg/100 ml)	IgM (mg/100 ml)	IgG (mg/100 ml)
Saturnine gout			
9 Negro, 1 white	425 ± 178[a]	104 ± 55	1435 ± 175
Nonsaturnine gout			
9 Negro, 6 white	450 ± 126	128 ± 102	1719 ± 471

[a] Average and standard deviation.

spond to those reported for healthy adults by other investigators (4, 6, 7). The high serum IgA and IgG values obtained for Negro controls compared to white controls corroborate the findings of others (7). Similar differences were also noted between the Negro gout patients and white gout patients (Table I). Grouping the controls according to occupation or hospital status did not reveal any differences other than those which could be ascribed to race.

Discussion. Similar elevations of the serum immunoglobulins have been observed in patients with rheumatoid arthritis (1–3). Both the significance of such observations and the underlying events resulting in the changes remain obscure. An immunological mechanism appears reasonable, although other mechanisms can not be excluded. With respect to gout, it seems possible that the intense intra-articular inflammation may result in the formation of antigenic substances which in turn provoke increased synthesis of immunoglobulins. Weissmann (8) hypothesized the formation of such substances in inflammatory arthritic conditions, including gout, following the release of lysosomal enzymes. Our findings tend to give substance to this view.

Summary. Serum levels of IgA, IgM, and IgG were determined in a group of 25 patients with primary and secondary gout. Significant elevations of IgA were found in both groups.

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