93. Demonstration of Anti–Central Nervous System Antibodies in Sera of Patients with Systemic Lupus Erythematosus by Western Blots and Immunohistochemistry Using Human Tissue

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We investigated the presence of anti–central nervous system (CNS) antibodies in systemic lupus erythematosus (SLE) using human CNS tissue as substrate. The population included 31 patients with SLE and 89 age-matched controls. Only one of the SLE patients had active CNS disease. For comparison, 16 antinuclear antibody–positive (ANA+) patients with other rheumatic diseases were also studied. The serum samples were screened against Western blots and tissue sections prepared from normal human autopsy-derived cerebellum (CER) and frontal cortex (FC). Serum immunoreactivity was revealed using HRP-conjugated antihuman IgG. The results included: (1) when screened against CER blots the incidence of banding was 61% in SLE and 28% in controls ($p < 0.01$); (2) when screened against FC blots the incidence of banding was 35% in SLE and 18% in controls ($p < 0.05$); (3) when screened against CER sections, the incidence of staining was 48% in SLE and 4% in controls ($p < 0.001$); (4) when screened against FC sections, the incidence of staining was 16% in SLE and 4% in controls ($p < 0.05$); (5) there was a much greater incidence of immunoblot reactivity in the SLE population as compared to the other ANA+ serum samples ($p < 0.001$) but not when screened against tissue sections; (6) in SLE there was no correlation between immunoreactivity revealed by blots and tissue sections; (7) on tissue sections SLE-immunoreactivity correlated with titers of ANA ($p < 0.01$), anti-DNA ($p < 0.05$), and anti-RNP ($p < 0.05$), but not with treatment or degree of systemic disease. These findings suggest that immunoblots and tissue sections detect different aspects of the anti-CNS immunoreactivity in SLE. There was higher anti-CER than anti-FC reactivity on blots and tissue sections in SLE. Also 90% of SLE patients are positive for anti-CNS antibodies using both testing techniques. It is possible that SLE patients develop CNS symptoms when circulating anti-CNS antibodies enter the CNS, possibly by crossing an impaired blood-brain barrier or through retrograde axonal transport. (Supported by a grant from the Physicians' Services Inc. Foundation.)

96. Anti–Central Nervous System Antibodies in Childhood Neurological Diseases

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To study the incidence of circulating anti–central nervous system (CNS) antibodies in childhood neurological diseases, a population study was undertaken. Serum samples were obtained during routine blood tests from a total of 348 children and stored at −80°C until studied. Informed consent was obtained from all participants. The study was approved by hospital ethics review committees. One hundred ninety-nine of the samples were from children with no known neurological illnesses who served as the control group. One hundred twenty-one of the samples were from children with epilepsy, and the remaining 28 were from children with a number of different neurological conditions. The serum samples were screened against normal adult autopsy-derived cerebellar (CER) and frontal cortex (FC) tissue sections and Western blots. Selected serum samples were also screened against mouse CNS tissue sections. Serum immunoreactivity was revealed using horseradish peroxidase–conjugated anti–human IgG. Important findings included: (1) patients with epilepsy had an increased incidence of anti-CNS reactivity as revealed on FC immunoblots ($p < 0.05$) but not on CER immunoblots; (2) the pattern of immunoreactivity was similar in patients with generalized seizure disorders and those with partial or mixed seizure disorders; (3) in epilepsy there was no correlation between positive immunoreactivity and individual anticonvulsants or combinations of anticonvulsants taken; (4) there was an increase in the incidence of immunoblot reactivity with age in the control subjects and those with neurological disease; (5) there was an increased incidence of immunoblot reactivity in patients with a presumed inflammatory central or peripheral neurological disease; (6) in 6 patients with opsoclonus-myoclonus there was CER-specific immunoreactivity with identified antigenic molecular weights of 27 and 35 kD_a in one patient and transient 62 kD_a-reactivity in another. There was no difference in immunoreactivity between males and females. There was no significant increase in immunoreactivity in children with cognitive disturbances including developmental delay, mental retardation, and autism. (Supported by a grant from Physicians' Services Incorporated Foundation.)