Expression of a Neural Cell Adhesion Molecule Serum Fragment Is Depressed in Autism

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The level of a neural cell adhesion molecule (NCAM) serum fragment in autism was determined by using an antiserum prepared with immunoaffinity purified mouse NCAM. Autistic patients (N=16) had statistically significantly decreased serum NCAM levels compared with age-matched controls ($p<0.0005$). This observation could not be attributed to a medication-induced effect. Depressed serum NCAM levels in autism are distinct from schizophrenia, in which serum NCAM levels are elevated.[1]

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Autism is a syndrome characterized by social and communicative deficits of early onset, accompanied by abnormal behaviors. There are many different biomedical causes underlying autistic symptomatology, including genetic, metabolic, and infectious ones, as reviewed by Coleman and Gillberg 1985.[2] However, in the majority of autistic patients no clear etiology is ascertainable.

In the past, autism was considered to be a form of schizophrenia. Indeed, the term *autism* itself was coined by Bleuler[3] in 1911 to designate a category of thought disorder present in schizophrenia. In 1943, Kanner[4] described infantile autism as a distinct diagnostic entity, but still closely related to schizophrenia. Subsequently, diagnostic criteria for infantile autism have been developed that clearly distinguish it from schizophrenia and other psychoses.[5–8] However, accurate distinctions in disturbed young children are frequently difficult to make.

It has been suggested that schizophrenia comprises two potentially overlapping syndromes: type I and type II.[9] Type I schizophrenia is characterized by positive symptoms, which include delusions, hallucinations, and thought disorders. Type II schizophrenia is associated with negative features, such as loss or absence of affect, poverty of speech, and loss of volition; it is more closely associated with intellectual impairment and structural brain changes.[10,11]

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Lymphocyte Function in Autism and Rett Syndrome

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Abstract
Peripheral blood lymphocytes from 17 patients with autism were separated on a Ficoll-Hypaque density gradient. Patients had normal numbers of T and B cells and T cell subsets. Although CD4:CD8 ratios were normal for the whole group (2.09 ± 0.97), 6 patients had elevated ratios (>2.2) and 5 had decreased ratios (<1.5). Mitogen-induced proliferation (concanavalin-A and phytohemagglutinin) was normal as was the autologous mixed lymphocyte reaction for the whole group. There was an abnormally increased percentage of DR+ (activated) T lymphocytes in 11 patients. With increasing age percentage of DR+ lymphocytes decreased. No patient had interleukin-2 (IL-2) receptor+ cells. Similar investigations performed on blood samples from 8 girls with Rett syndrome produced normal results. 11 of 17 autistic patients had an abnormally increased percentage of DR+ but not IL-2 receptor+ lymphocytes suggesting 'incomplete' activation, a finding which is seen in autoimmune diseases. The decrease in activated cells with increasing age suggests that there may be an autoimmune process which is more active earlier in life in a subset of autistics.

Key Words
Autism
Lymphocytes
Neuroimmunology
Rett syndrome

Introduction

Autism is a syndrome characterized by social and communicative deficits of early onset accompanied by abnormal behaviors. There are many biomedical causes underlying autistic symptomatology [1]. However, in the majority of autistic patients no clear etiology has been ascertained.

Immune system abnormalities have been associated with autism. These have included inhibition of macrophage migration in response to human myelin basic protein [2], reduced mitogen-induced lymphocyte blastogenesis [3, 4], decreased numbers of T lymphocytes with altered ratios of helper to suppressor T cells [4], decreased helper T cell and B cell numbers [5], deficiency of suppressor-inducer T cells [6], decreased natural killer cell activity [7], and the demonstration of circulating antibodies to serotonin receptors [8]. In another study of 14 patients with autism, 8 had an abnormal lymphocyte proliferative response to mitogens and to autologous lymphocytes and monocytes [9].

This study was undertaken in an attempt to help to better define immune system abnormalities in autism.

For comparison, girls with Rett syndrome were also investigated. In Rett syndrome, following normal early development, there is cognitive and functional decline frequently associated with autistic symptomatology [10, 11]. It is possible that cellular immune system abnormali-

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