



Is autism an autoimmune disease?

Paul Ashwood, Judy Van de Water  

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Abstract

Autism spectrum disorder (ASD) is a spectrum of behavioral anomalies characterized by impaired social interaction and communication, often accompanied by repetitive and stereotyped behavior. The condition manifests within the first 3 years of life and persists into adulthood. There are numerous hypotheses regarding the etiology and pathology of ASD, including a suggested role for immune dysfunction. However, to date, the evidence for involvement of the immune system in autism has been inconclusive. While immune system abnormalities have been reported in children with autistic disorder, there is little consensus regarding the nature of these differences which include both enhanced autoimmunity and reduced immune function. In this review, we discuss current findings with respect to immune function and the spectrum of autoimmune phenomena described in children with ASD.

Introduction

The autistic spectrum disorders (ASD) are complex developmental disorders that are characterized by impairments in social interaction, deficits in communication and stereotyped patterns of behavior [1]. ASD describes a range of conditions including autism and Asperger's syndrome, in which, for the majority of cases the cause remains unknown. So far, unequivocal evidence for a genetic association with ASD has yet to be established, with the most likely genetic models predicting multiple and weak gene interactions of 15 or more. Equally, ASD has been linked with environmental factors such as congenital rubella infection, anticonvulsants and antiemetics taken during pregnancy, perinatal hypoxia and postnatal infections such as encephalitis [2], [3]. Various genetic, prenatal and early postnatal environmental or biochemical factors have been implicated in ASD, but neither a definitive pattern of its etiology nor its pathophysiology has emerged to date.

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Section snippets

The neuroimmune system in ASD

Systemic immunologic aberrations in ASD have been linked with both autoimmunity, describing antibodies reactive for central nervous system (CNS) proteins with the potential for neuronal tissue destruction, and with dysfunctional immunity such as abnormalities or deficits of function in immune cell subsets. The relationship between the various immune abnormalities that have been reported in individuals with ASD and the development of neurologic changes is not yet clear. There has been ...

Autoimmunity in ASD

The first suggestion that autoimmunity may be etiologically important in autism was

noted in a case report in 1971 describing an autistic child with a strong family history of autoimmune disorders [11]. Common genes may contribute to a number of different autoimmune states in families [12], and immune dysfunction and brain development may be governed by similar genes (e.g., MHC third hypervariable region sequences 1 and 2, which have been associated with both autism and rheumatoid arthritis [13] ...

The role of xenobiotics in autism

Recently, it has been hypothesized that environmental exposure to various xenobiotics may contribute to ASD etiology either through direct or indirect effects on the immune system and/or the developing CNS. A variety of interactions among environmental agents, immune system dysfunction and ASD can be envisioned. The neuropathology of ASD may be induced and/or exacerbated by infectious agents or other toxicants as a direct consequence of activation of the immune system. Neurotoxicity may occur ...

Summary

In conclusion, numerous world-wide studies have demonstrated immunological abnormalities in children with ASD. These include the presence of autoantibodies to several antigens pertinent to the nervous system. However, as yet, no definitive autoantibody pattern in ASD has emerged. Admittedly, ASD encompasses a broad spectrum of behavioral anomalies and as such several sub-phenotypes may be represented. In addition, the presence of autoantibodies in the serum of these patients may be a secondary ...

Take-home messages

- Patients show evidence of immune dysregulation. ...
- Autoantibodies have been described in patients with autism to brain antigens. ...
- There is an increased incidence of autoimmune disease in the families of patients with autism. ...

...

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