CASE REPORT
Iran J Allergy Asthma Immunol
September 2013; 12(3):287-289.

Autism in a Child with Common Variable Immunodeficiency

Mohammad Salehi Sadaghiani[1], Asghar Aghamohammadi[1], Mahmoud-Reza Ashrafi[2], Firozeh Hosseini[1], Hassan Abolhassani[1], and Nima Rezaei[1,3]

[1] Research Center for Immunodeficiencies, Pediatrics Center of Excellence, Children's Medical Center, Tehran University of Medical Sciences, Tehran, Iran
[2] Department of Pediatrics, Pediatrics Center of Excellence, Children's Medical Center, Tehran University of Medical Sciences, Tehran, Iran
[3] Molecular Immunology Research Center, Department of Immunology, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran

Received: 9 September 2012; Received in revised form: 21 September 2012; Accepted: 30 October 2012

ABSTRACT

Autism is a neurodevelopmental disorder, characterized by poor social interaction and communication impairment and repetitive behavior. Autism is considered as a genetic and multifactorial disorder, with diverse risk factors involved.

Herein, we report a 13-year-old male with common variable immunodeficiency (CVID), who was diagnosed with autism at the age of 3 years old.

As there are some evidences about the role of the immune system defects in the pathogenesis of autism, specific primary antibody deficiency diseases such as CVID might predispose some affected cases to this neurodevelopmental disorders.

Keywords: Antibody Deficiency Syndrome; Autism; Common variable immunodeficiency

INTRODUCTION

Autism is a neurodevelopmental disorder, characterized by weak social interaction, verbal and non-verbal communication impairment and restricted and repetitive pattern of behavior; the symptoms are usually presented by the age of 3 years. The screening and surveillance policies have led to early detection and a better outcome.[1]

Autism is considered as a multifactorial disorder, with diverse risk factors. Defects in immunity are a recently discovered entity with increasing evidences in the literature.[2-5]

Common variable immunodeficiency (CVID) is the most common symptomatic primary immunodeficiency, characterized by hypo-gammaglobulinemia and impaired antibody responses,[6-9] which may associate with some neurological disorders.[10,11] Herein, we report a CVID patient who has been suffered from autism since the age of 3 years.

Corresponding Author: Asghar Aghamohammadi, MD, PhD; Children's Medical Center Hospital, Tehran 14194, Iran. Tel: (+98 21) 6642 8998, Fax: (+98 21) 6692 3054, E-mail: aghamohammadi@sina.tums.ac.ir

CASE REPORT

A 13-year-old male with CVID from non-consanguine parents is presented here, who had history

Published by Tehran University of Medical Sciences (http://ijaai.tums.ac.ir)

of recurrent infections since early childhood. He had a history of acute otitis media, diarrhea and vomiting since 10 months old. He was admitted at 2 years of age due to pneumonia. When the child was 3-years old, the diagnosis of autism was established based upon DSM-IV criteria including the decline in social interaction, language, symbolic and imaginative play. The next admission was due to septic arthritis in left knee 2 years later. The first episode of seizure started at age 4.5 years, accompanied with a decrease in level of consciousness. The seizure was tonic contracture of upper limbs. Brain CT scan revealed mild brain atrophy. Since then, he was on the maintenance therapy of seizure. The diagnosis of CVID was established in 5th year of his life based on the immunological studies (IgG <100 mg/dL, IgA <10 mg/dL, IgM =20 mg/dL, and CD3+ lymphocytes =65.14%, CD3+CD4+ lymphocytes =43.86%, CD3+CD8+ lymphocytes =32.01%, CD19+lymphocytes = 5.18%). Although the treatment with intravenous immunoglobulin was started, the patient suffered from some episodes of cellulitis, diarrhea, conjunctivitis, oral thrush and sinobronchitis after the time of diagnosis.

DISCUSSION

Autism is one of the neurodevelopmental disorders, characterized with defects in three developmental fields: socialization, communication and behavior. Although exact etiologies of autism are unclear, both genetic and environmental factors seem to be involved.[1]

There is increasing evidence in the literature indicating the role of immune system defects in the pathogenesis of autism. Humoral and cellular immunity defects have been shown in small studies among autistic children, revealing decreased immunoglobulin production or B- and T- cell dysfunction.[12] Heuer *et al* in 2008 showed that children with autistic disorder had significantly reduced levels of plasma IgG and IgM, compared to normally developed children.[3] Immunoglobulin levels were negatively correlated with Aberrant Behavior Checklist scores for all children, meaning the lower Ig level could be associated with more severe symptoms.[3]

The association between autism and some primary immunodeficiency disorders has previously been reported. This association with hyper-IgE syndrome was discussed by Grimbacher *et al*.[13] who showed that proximal chromosome 4q is a candidate region for genes involved in both disorders.[12] Chromosome 4q is also considered as a possible loci for dominant CVID genes.[14] In the study of IgA deficient patients, Santaella *et al* showed that there is a higher occurrence of autism in the IgA deficient group, compared to control group.[5] Even intravenous immunoglobulin has been proven to improve autistic behavior.[2] More epidemiologic and genetic studies are required to establish the association between autism and CVID.

REFERENCES

1. Levy S E, Mandell D S, and Schultz R T. Autism. Lancet 2009; 374(9701):1627-38.
2. Gupta S, Aggarwal S, and Heads C. Dysregulated immune system in children with autism: beneficial effects of intravenous immune globulin on autistic characteristics. J Autism Dev Disord 1996; 26(4):439-52.
3. Heuer L, Ashwood P, Schauer J, Goines P, Krakowiak P, Hertz-Picciotto I, et al. Reduced levels of immunoglobulin in children with autism correlates with behavioral symptoms. Autism Res 2008; 1(5):275-83.
4. Kawashti M I, Amin O R, and Rowehy N G. Possible immunological disorders in autism: concomitant autoimmunity and immune tolerance. Egypt J Immunol 2006; 13(1):99-104.
5. Santaella M L, Varela Y, Linares N, and Disdier O M. Prevalence of autism spectrum disorders in relatives of patients with selective immunoglobulin A deficiency. P R Health Sci J 2008; 27(3):204-8.
6. Park M A, Li J T, Hagan J B, Maddox D E, and Abraham R S. Common variable immunodeficiency: a new look at an old disease. Lancet 2008; 372(9637):489-502.
7. Aghamohammadi A, Farhoudi A, Moin M, Rezaei N, Kouhi A, Pourpak Z, et al. Clinical and immunological features of 65 Iranian patients with common variable immunodeficiency. Clin Diagn Lab Immunol 2005; 12(7):825-32.
8. Webster A D. Clinical and Immunological Spectrum of Common Variable Immunodeficiency (CVID). Iran J Allergy Asthma Immunol 2004; 3(3):103-13.
9. Aghamohammadi A, Parvaneh N, Rezaei N. Common variable immunodeficiency: a heterogeneous group needs further subclassification. Expert Rev Clin Immunol 2009; 5(6):629-31.
10. Dehkordy S F, Aghamohammadi A, Ochs H D, and Rezaei N. Primary immunodeficiency diseases associated with neurologic manifestations. J Clin Immunol 2011;

Published by Tehran University of Medical Sciences (http://ijaai.tums.ac.ir)

32(1):1-24.

11. Saroukhani S, Aghamohammadi A, Mahmoudi-Gharaei J, Abolhassani H, Cheraghi T, Imanzaeh A, et al. Behavior abnormality following intravenous immunoglobulin treatment in patients with primary antibody deficiencies. Hum Psychopharmacol 2010; 25(5):419-22.
12. Warren R P, Margaretten N C, Pace N C, and Foster A. Immune abnormalities in patients with autism. J Autism Dev Disord 1986; 16(2):189-97.
13. Grimbacher B, Dutra A S, Holland S M, Fischer R E, Pao M, Gallin J I, et al. Analphoid marker chromosome in a patient with hyper-IgE syndrome, autism, and mild mental retardation. Genet Med 1999; 1(5):213-8.
14. Schaffer A A, Salzer U, Hammarstrom L, and Grimbacher B. Deconstructing common variable immunodeficiency by genetic analysis. Curr Opin Genet Dev 2007; 17(3):201-12.