Brain-Derived Neurotrophic Factor and Autism

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Autism is a severe neurodevelopmental disorder affecting, according to most recent estimates, around 3 to 6 per 1000 individuals. Though characterized by deficits in social interaction and communication and by gains in restricted and repetitive interests and behaviors, Autism has no laboratory test to identify the condition. Currently the etiology is unknown, but is suspected to encompass genetic, immunologic, and environmental factors. Interest has risen to locate early biological markers to allow for earlier identification and therapeutic measures for improved prognosis. The hypothesis is that Brain-derived neurotrophic factors (BDNF) could be the flag that could diagnose autism before birth.

BDNF is a protein found throughout the CNS and the peripheral blood. Its main role in the human body is the survival and differentiation of dopaminergic neurons in the developing brain and plays an important role in the formation and plasticity of synaptic connections. BDNF is required for serotonergic neurons, and in autism abnormal levels in serotonin are common biochemical occurrences. Animal studies point it the possibility that BNDF levels in the CNS and the peripheral blood are closely related which could prove useful as an early marker for autism.

This study was performed on a selection of children born in California from July 2000 to September 2001 to women pregnant in Orange County and who participated in the states prenatal expanded alpha-fetoprotein screening program (XAFP). From here children were divided into three categories: Children with autism, children with mental retardation (MR) and children from the general public controls. Children diagnosed with autism were further reviewed to understand the onset of their condition. “Early” was for children who never developed social skills and later lost them, “Regressive” labeled the children who developed language and social skills and over time lost them, the remainder of the children were left as unknown for those who did not have any solid documentation.

The Maternal mid- pregnancy and neonatal specimens collected during XAFP were used to determine measurements of BDNF for each child during pregnancy and after birth. The levels of BDNF in the autism group were compared to the GP and MR groups using two tests, a two-sample *t*-test and Kruskal-Wallis test. To determine the association between autism risk and BDNF levels graphical statistical data was used. Then to determine autism for the group of developed autism, data was compared to that from the GP and the MR groups.

Non related resulted results determined that children born with autism were less likely to be born from a mother of Hispanic decent or born in mexico, also observed was the large ratio of male to female children with autism (4:1).

After evaluation of the results it was determined that BDNF concentrations in maternal mid-pregnancy and new born specimens there was no difference between subjects with autism compared to subjects with MR or the GP control.

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Brain-derived neurotrophic factor and autism: maternal and infant peripheral blood levels in the Early Markers for Autism (EMA) Study A
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National Institute of Neurological Disorders and Stroke
Autism Fact Sheet
http://www.ninds.nih.gov/disorders/autism/detail_autism.htm#107103082