Studies confirm benefits of vitamin B6/magnesium therapy for autism, PDD, and ADHD

In a new report, French researchers confirm that megadose vitamin B6 and magnesium therapy markedly improves communication and behavior and aids in normalizing biochemistry in children with autism spectrum disorders. A related report, this one from Japan, indicates that the benefits of B6 therapy are long-lasting.

Mousain-Bosc et al: behavioral, biochemical improvements detected

Marianne Mousain-Bosc and colleagues note that studies from 18 different research groups, including 11 double-blind and placebo-controlled studies *(now 22 studies, 13 of them double-blind—ed.)*, show that B6/magnesium therapy benefits about half of autistic children. They note, too, that parents have successfully used the intervention for more than 30 years. "Despite these reports," the researchers note, "this intervention remains controversial," with the American Psychiatric Association and American Academy of Pediatrics stating that megavitamin therapy for autism is not justified.

To explore the behavioral and biochemical effects of B6 and magnesium treatment, Mousain-Bosc and colleagues enrolled 33 children with autism or pervasive developmental disorder (PDD) in an open trial of the nutrients. The children, who ranged in age from 1 to 10, received 0.6 milligrams per kilogram per day of vitamin B6 and 6 milligrams per kilogram per day of magnesium. Treatment lasted an average of eight months.

Before and after treatment, the researchers, with help from the children's parents and teachers, scored the children's symptoms in four categories: social, communicative, behavioral, and functional. They also measured the children's intra-erythrocyte magnesium (ERC-Mg), serum magnesium, and blood ionized calcium. A group of non-disabled children served as controls for biochemical analyses.

The researchers found that Erc-Mg levels were significantly lower in children with autism spectrum disorders than in control children. Mothers and fathers of autistic children also had decreased Erc-Mg levels. Sixty-five percent of autism-spectrum children who continued taking the supplements for at least two months exhibited a statistically significant rise in ERC-Mg values, although their levels were still lower than those of the controls.

Treatment for at least two months also reduced the children's social, communicative, behavioral, and functional symptoms. Of the 33 children with PDD or autism, 23 showed improvements in social interactions, 24 showed better communication skills, 18 exhibited fewer stereotyped behaviors, and 17 had fewer problems with abnormal or delayed functional behavior. Twenty of the 33 children, or 60%, showed improvement in at least three of the four symptom clusters measured. When the researchers discontinued the treatment, they say, "clinical symptoms of the disease reappeared in a few weeks."

Mousain-Bosc and colleagues say that magnesium is typically considered to play only a supporting role in B6 therapy, by reducing the hyperactivity sometimes associated with B6 treatment. However, they say, "This study suggests that the behavioral improvement observed with the combination vitamin B6-magnesium in PDD/autism is associated with concomitant modifications of Erc-Mg values," indicating a strong treatment effect for magnesium.

The researchers note that even mild deficiencies of magnesium are associated with irritability, sensitivity to noise, hyperexcitability, apprehension, and belligerence—all problems seen in autism. As parents also had reduced Erc-Mg values, the researchers suggest the possibility of a genetic vulnerability causing cellular magnesium depletion. They note, however, that not all of the children who improved showed elevations in Erc-Mg levels.

In a related study, the same researchers measured the Erc-Mg levels of 40 children with ADHD, and administered the same doses of vitamin B6 and magnesium to this group for a minimum of eight weeks. They report that the ADHD children also had significantly lower Erc-Mg values than controls. In almost all cases, they report, the B6/magnesium regimen, if followed for at least two months, "significantly modified the clinical symptoms of the disease: namely, hyperactivity and hyperemotivity/aggressiveness were reduced, [and] school attention was improved." Treatment also led to a significant increase in Erc-Mg values. As with the autistic children, cessation of treatment led to a return of symptoms.

In the ADHD group, Mousain-Bosc and colleagues report, "the more Erc-Mg values [were] elevated before treatment, the more hyperactivity was improved"—an indication that it takes time to restore depleted magnesium levels to therapeutic ranges.

Kamiyama et al: long-term verbal IQ improvements seen with B6

In related research, M. Kamiyama and colleagues followed up on a previous study showing that vitamin B6 improved verbal IQ (VIQ) scores in children with pervasive developmental disorders and hypersensitivity to sound. The researchers report that the children's VIQ scores continued to improve over time. In addition, they say, "An analysis of the reports of their daily life provided by their parents and teachers showed that the children's hypersensitivity to sound was also improved," and that the children were better able to adjust to their environment both at school and at home "without any panic."

Kamiyama and colleagues conclude, "Our results indicate there are PDD subgroups whose expressive language capabilities and hypersensitivity to sound can be improved by pyridoxine treatment."

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"Improvement of neurobehavioral disorders in children supplemented with magnesium-vitamin B6. II. Pervasive developmental disorder-autism," M. Mousain-Bosc, M. Roche, A. Polge, D. Pradal-Prat, J. Rapin, and J. P. Bali, *Magnesium Research*, Vol. 19. No. 1, March 2006, 53-62; and, "Improvement of neurobehavioral disorders in children supplemented with magnesium-vitamin B6. I. Attention deficit hyperactivity disorders," M. Mousain-Bosc, M. Roche, A. Polge, D. Pradal-Prat, J. Rapin, and J. P. Bali, *Magnesium Research*, Vol. 19. No. 1, March 2006, 46-52. Address for both: Jean-Pierre Bali, Explorations Fonctionnelles du Système Nerveux, Centre Hospitalier Universitaire Carémeau, Nîmes, France, jp.bali@wanadoo.fr.

—and—

"A clinical study of pyridoxine treatment for pervasive developmental disorders with hypersensitivity to sound," M. Kamiyama, S. Kuriyama, and M. Watanabe, *No To Hattatsu*, Vol. 38, No. 4, July 2006, 277-82. Address: M. Kamiyama, Department of Education, Art and Science, Yamagata University, Yamagata, Japan, kamiyama@e.yamagata-u.ac.jp.

In memoriam: Lorna Jean King

The field of autism lost another leader when Lorna Jean King, OTR, FAOTA, a world expert in the field of sensory integration therapy, passed away recently.

King, who pioneered many of the sensory therapies used today in autism programs around the world, was the founder, director, and CEO of the Children's Center for Neurodevelopmental Studies in Arizona. In 1978 she received the prestigious Eleanor Clarke Slagle Lectureship Award, the highest honor bestowed by her profession.

King began her career in occupational therapy in the 1940s, and became Director of Rehabilitative Therapies for Arizona State Hospital in 1974. There, she first discovered the value of sensory integration therapy in treating individuals with schizophrenia and autism. Her success led her, in 1978, to open the Children's Center for Neurodevelopmental Studies, which now has two sites in Arizona**.** The center's interventions, designed to encourage the formation of new neural pathways, frequently lead to dramatic improvements in behavior, learning, and sensory problems.

Lorna Jean King's work continues to benefit thousands of autistic children around the world. She will be greatly missed by her many friends in the autism community.