B6 therapy raises verbal IQ in children with PDD

A new Japanese study shows that vitamin B6 (pyridoxine) supplementation can increase the verbal IQ of a subgroup of children with pervasive developmental disorders.

Shinichi Kuriyama and colleagues noted that some children with pervasive developmental disabilities (PDDs) strongly resemble children with pyridoxine-dependent epilepsy, an inherited condition caused by an inborn error of B6 metabolism and treated with megadoses of the vitamin. Symptoms of pyridoxine-dependent epilepsy that are also seen in many cases of PDD include expressive verbal disorders, hypersensitivity to sound and/or touch, anxiety and agitation, poor motor coordination, sleep problems, poor muscle tone, and large head circumference.

"The observed similarity in these clinical features," the researchers say, "has led us to speculate that [one] subtype of PDDs might have a similar pathophysiological mechanism to pyridoxine-dependent epilepsy." To test their theory, Kuriyama et al. conducted a four-week randomized, placebo-controlled, double-blind trial of pyridoxine's effects on 15 children with PDD. The participants, who ranged in age from 6 to 16, had symptoms including expressive verbal disorders, motor coordination problems, and sound hypersensitivity. They received two daily doses (100 mg each) of B6 in powder form, or a placebo, with compliance measured by tests of blood B6 levels.

The researchers report, "Pyridoxine treatment was associated with a significant increase in verbal IQ scores." Verbal IQ scores in the pyridoxine group increased by 11.2 points, compared to a 6-point increase seen in subjects taking the placebo. These results remained significant after the researchers controlled for sex, age, body weight, and other variables.

The researchers, while noting that their study was fairly small, say their results point to the need to "define the association between pyridoxine and children with PDDs."

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Editor's Note: These researchers appear to be unaware that theirs is the 20th study to show positive effects of vitamin B6 in autism. These results were positive despite the rather low dose of B6 they employed, and their failure to use supplemental magnesium, which greatly enhances the effect of the B6.

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"Pyridoxine treatment in a subgroup of children with pervasive developmental disorders," Shinichi Kuriyama, Machiko Kamiyama, Mikako Watanabe, Seiko Tamahashi, Itaru Muraguchi, Toru Watanabe, Atsushi Hozawa, Takayoshi Ohkubo, Yoshikazu Nishino, Yoshitaka Tsubono, Ichiro Tsuji, and Shigeru Hisamichi, *Developmental Medicine and Child Neurology*, April 1, 2002. Address: Shinichi Kuriyama, Department of Public Health, Tohoku University School of Medicine, Sendai 980-85 75, Japan.

SECRETIN STUDY:

Repligen Corporation has initiated a Phase 3 clinical trial to evaluate the safety and effectiveness of synthetic human secretin. Young children with autism between the ages of 2 years 8 months and 4 years 11 months are eligible to participate. The study involves 11 clinical visits over a five month period.

Subjects are currently being recruited in Boston, Dallas, Los Angeles, Phoenix, San Antonio, Seattle, Columbus, OH, and Portland, OR. Additional sites are expected to open within several months in the New York area, Florida, Birmingham, Oakland, Cleveland, Detroit, Indianapolis, Houston, St. Louis and New Orleans. Contact information for the clinical sites may be obtained by visiting www.repligen.com or by calling 1-800-622-2259 and selecting option 5.

Never too early: ABA effective for one-year-old

Even a one-year-old can make dramatic progress in an intensive early intervention program that addresses autistic behavior deficits, according to a recent study.

Gina Green and colleagues designed an educational program for a 14-month-old child considered at high risk for autism. The girl, who has one autistic brother and another brother with language delays, initially developed normally but regressed at around 11 months of age. At the time the intervention began, she made only two sounds, avoided eye contact with people, and exhibited rituals and stereotypical behaviors including holding long, narrow objects such as chopsticks in front of her face for long periods. She did not respond to her name or simple instructions, and showed little emotion or facial expression.

> At one year of age, the girl made only two noises, did not make eye contact or show emotion, and exhibited ritualistic and stereotyped behaviors. By five, she was enrolled in a regular kindergarten and functioning at age level academically and socially.

The researchers implemented a 25- to 33-hour-a-week, one-on-one program of applied behavior analysis (ABA), involving a teacher and other behavioral experts as well as the child's parents. When the girl was 2, the intervention was increased to 30 to 36 hours per week.

Tests revealed, the researchers say, that "after about 18 months of intensive ABA treatment, most of [the girl's] skills were at or above age level," and that she readily made eye contact and exhibited spontaneous and age-appropriate speech, play skills, and joint attention. By the end of her final year of therapy, when she was nearly five, tests revealed a full-scale IQ of 119, and a psychologist noted no behavioral or developmental abnormalities.

During therapy, the girl was gradually phased into preschool programs for developmentally delayed children, and later into classes for non-disabled children. At five, she entered a regular public school kindergarten, with no diagnosis of disability and no need for support. Her teachers, who were not informed of the child's previous diagnosis, report no concerns and say that she is functioning well academically and socially.

The researchers note that because the child was only one year old when therapy began, they initially tried a naturalistic, child-initiated format, but that this approach did not result in significant improvement. When they switched to a more structured approach including "discrete trial" instruction, the girl began making rapid gains. However, they say, their treatment plan also included a range of other procedures and was not overly restrictive and did not involve lengthy high-chair sessions.

"At the same time," they say, "it is important to note that we did not rely exclusively on naturalistic, child-initiated instructional methods; indeed, the treatment team determined that such methods were not effective initially because [the child] did not spontaneously exhibit much interest in many items, activities, or people. Perhaps rates of learning and outcomes like those documented here can be produced by intervention that relies more on naturalistic, incidental, child-initiated procedures and less on adult-directed instruction than ours did, but at present that appears to be an open empirical question."

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"Intensive behavioral treatment for a toddler at high risk for autism," Gina Green, Lynn C. Brennan, and Deborah Fein, *Behavior Modification*, Vol. 26, No. 1, January 2002, 69-102. Address: Gina Green, Institute for Effective Education, 2255 Camino del Rio South, San Diego, CA 92108.