

Improvements seen in autistic children undergoing HBOT

A new retrospective study supports prior research (see ARRI 19/3) showing low-pressure hyperbaric oxygen therapy (HBOT) to benefit autistic children.

Daniel and Lanier Rossignol evaluated six autistic children who underwent low-pressure HBOT. The children ranged in age from 2 to 7, and all were taking antioxidant supplements prior to the trial.

Five of the children completed 40 one-hour HBOT sessions, while the sixth finished only 25 due to scheduling conflicts but was included in the data analysis. HBOT was administered at 1.3 atmospheres absolute (ATA) and 28-30% oxygen. Before and after the children's treatment, their parents rated them on three behavioral scales—the Autism Treatment Evaluation Checklist (ATEC), the Childhood Autism Rating Scale (CARS), and the Social Responsiveness Scale (SRS). The researchers report that:

—The average improvement on the ATEC was 22.1%, with younger children improving by nearly 32% and older children by nearly 9%.

—The average improvement on the CARS was 12.1%, with younger children again improving more than older children (18% vs. 5.6%).

—The average improvement on the SRS was 22.1%, with young children improving nearly 29% and older children 13%.

—No adverse effects were seen in any of the children.

The researchers say, "HBOT has been shown to increase oxygen delivery to hypoperfused or hypoxic tissues, decrease inflammation and oxidative stress [cell dysfunction or damage caused by free radicals], and mobilize stem cells from human bone marrow." The improvement in their subjects, they say, could be due to any of these effects or a combination.

They note that there is some conflicting evidence as to the effects of HBOT on oxida-

tive stress, with numerous studies showing improvements but some showing increased oxidative stress in individuals undergoing HBOT at 2.5 ATA or greater. Thus, they say, "there might be an optimal HBOT pressure, which falls somewhere below 2.5 ATA." While low-pressure HBOT appears to have beneficial effects on oxidative stress, the researchers say that the use of antioxidants prior to treatment may be a wise precaution.

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"Hyperbaric oxygen therapy may improve symptoms in autistic children," Daniel A. Rossignol and Lanier W. Rossignol, *Medical Hypotheses*, 2006, in press. Address: Daniel A. Rossignol, Blue Ridge Medical Center, 4038 Thomas Nelson Highway, Arlington, VA 22922.

Vitamin B6 and autism (continued from page 1)

cases. This may explain the many reports of improvement in autistic symptoms upon treatment with high-dose vitamin B6."

The researchers note that 11 of 12 double-blind, placebo-controlled studies show that vitamin B6 is beneficial for autistic individuals. They say that giving P5P is no more beneficial than giving vitamin B6 in the standard form of pyridoxine HCl, noting that in a previous study comparing six months of treatment with P5P to similar treatment with pyridoxine HCl they found that 10% of children in the P5P group exhibited worse behavior, compared to none in the pyridoxine HCl group. Thus, they conclude, "We believe that vitamin B6 should be given as pyridoxal HCl or pyridoxine HCl, not as P5P."

Editor's note: For information on dosage of B6, see www.VitaminB6dosage.com.

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"Abnormally high plasma levels of vitamin B6 in unsupplemented children with autism compared to unsupplemented controls," J. B. Adams, F. George, and T. Audhya, *Journal of Alternative and Complementary Medicine*, Vol. 12, No. 1, 2006, 59-63. Address: James B. Adams, Arizona State University, P.O. Box 876006, Tempe, AZ 85287-6006.

Newborn encephalopathy, autism linked by new study

Newborns who have seizures or exhibit other symptoms of encephalopathy (abnormal brain activity) are nearly six times more likely to develop an autism spectrum disorder than other children, according to a recent study from Australia.

Between 1993 and 1996, Nadia Badawi and colleagues identified 276 full-term babies who suffered from moderate or severe newborn encephalopathy (NE), matching them to 564 randomly selected controls. Of the babies with NE, 239 survived to the age of five. Of these, 12 were diagnosed with an autism spectrum disorder. In the control group, five of the surviving 563 children were diagnosed with an autism spectrum disorder by the age of five. "Thus," the researchers say, "the infants with NE were 5.9 times more likely to be diagnosed with an autism spectrum disorder than controls."

The authors observe that the reason for the association between NE and autism is unclear, but say their findings "suggest that children with a history of NE should be considered to be at an increased risk of autism spectrum disorders." Doctors of these children should screen them carefully for symptoms of autism, Badawi et al. say, because of the benefits of early intervention.

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"Autism following a history of newborn encephalopathy: more than a coincidence?" Nadia Badawi, Glenya Dixon, Janine F. Felix, John M. Keogh, Beverly Patterson, Fiona J. Stanley, and Jennifer J. Kurinczuk, *Developmental Medicine and Child Neurology*, Vol. 48, 2006, 85-9. Address: Nadia Badawi, Department of Neonatology, The Children's Hospital at Westmead, Locked Bag 4001, Westmead, New South Wales, NSW 2145, Australia, nadiab@chw.edu.au.

Reminder: A subscription to the ARRI is a perfect gift for a parent or teacher!

QUOTABLE: "Many of us in Congress are concerned about the possibility of an association between autism and thimerosal in vaccines. While we understand that the Institute of Medicine (IOM) has determined that the evidence thus far does not support an association, we know that for too many the issue is still not resolved. The exposure of American children from 1990 to 2001 to thimerosal was unique—it was 75 percent greater than their European counterparts who are the focus of the majority of the epidemiological research on this issue upon which the IOM relied. This period coincided with an autism epidemic now affecting one out of every 166 children. Additionally, thimerosal is by weight 50 percent ethyl mercury, which is a potent neurotoxin. The levels of thimerosal in these vaccines exceeded the EPA oral daily dose limit for methyl mercury by over 120 times at the 2, 4, and 6 month pediatric visit. Therefore, we believe that there is room for a closer look on any potential association between thimerosal exposure and the risk of autism.... Unfortunately, as the IOM pointed out in its April 2005 report... a CDC-led study on thimerosal and autism could be viewed with much skepticism and may not be accepted by the growing number of parents with concerns about vaccine safety and the possible links between thimerosal and autism. If the federal government is going to have a study whose results will be broadly accepted, such a study cannot be led by the CDC."

—From a letter to the National Institute of Environmental Health Services, February 22, 2006, sent by a bipartisan group of Congressional Representatives. The letter followed the enactment of legislation by Congress that supports research into the role of thimerosal in the autism epidemic.