

Autism Research in Japan

Enzyme may be useful

A team of researchers (Naruse et al.) has developed a technique for mass-producing the enzyme tetrahydrobiopterin (R-THBP) and reports that the substance may help alleviate the symptoms of autism.

R-THBP — an enzyme which occurs naturally in the human body — works with tyrosine and tryptophan, enzymes involved in the synthesis of serotonin and catecholamines. Serotonin and catecholamines transmit messages between nerve cells, and abnormal levels of these substances have been found in autistic subjects.

In a double-blind, placebo-controlled study, Naruse and fellow researchers administered R-THBP to 84 autistic subjects for 12 weeks. They found that 53.7% of subjects receiving the drug showed significant improvement (compared to 30.9% on the placebo) and that only one child's behavior worsened on R-THBP. The researchers report that "an especially marked effect of R-THBP was observed in the group under the age of five years."

They add that while tranquilizers treat only the symptoms and not the causes of autism, "R-THBP was most effective in improving those abnormal behaviors of autistic patients which seemed to be the core symptoms of the disease."

In animal tests, R-THBP has been shown to double or even quadruple the production of serotonin and catecholamines in the brain. This finding of the substance's apparent effectiveness in treating autism appears to contradict the theory that high serotonin levels are an underlying cause of the disorder.

Editor's note: R-THBP currently is not available in the U.S. Future research into R-THBP will be summarized in the ARRI as we learn of it.

"Therapeutic effect of tetrahydrobiopterin in infantile autism," Hiroshi Naruse, Tokishi Hayashi, Masashi Takesada, Akifumi Nakane, Kousuke Yamazaki, Teruhisa Noguchi, Yasuyoshi Watanabe, and Osamu Hayaishi; *Proceedings of the Japan Acad.*, Vol. 63, No. 8, Ser. B, 1987, pp. 231-233. Address: Hiroshi Naruse, Nat'l. Ctr. of Neur. and Psych., Tokyo 187, Japan.

Tryptophan level studied

Numerous studies of autistic patients have found deficiencies in the brain's ability to utilize serotonin, one of the "messenger" chemicals or neurotransmitters which enable nerve cells to communicate with each other.

Japanese researchers have recently found that autistic children's blood plasma contains abnormal levels of tryptophan, an amino acid which is believed to greatly af-

fect serotonin synthesis and serotonin content in the brain.

The study by Hoshino et al. showed that both blood serotonin levels and plasma concentrations of free tryptophan were significantly higher in autistic children than in normal children or adults. In addition, the level of plasma free tryptophan in autistic children correlated positively with the severity of autistic symptoms and hyperactivity, and negatively with DQ (Developmental Quotient).

"Blood serotonin and free tryptophan concentration in autistic children," Yoshihiko Hoshino, Toshiaki Yamamoto, Motohisa Kaneko, Ryuichi Tachibana, Makoto Watanabe, Yoshinori Ono, and Hisashi Kumashiro; *Neuropsychobiology*, No. 11, pp. 22-27, 1984. Address: Yoshihiko Hoshino, Department of Neuropsychiatry, Fukushima Medical College, Sugitsuma-cho 4-45, Fukushima-shi, Fukushima-ken 960, Japan.

Autism, language delay may share genetic link

Autistic children and children with developmental language disorder (DLD) may share a genetic defect involving abnormal brain metabolism of the chemical neurotransmitter serotonin, according to Katsui et al.

The researchers measured the absorption of serotonin by platelets in the blood, using this as a model for how brain cells react to serotonin. They found that the platelets of children with either autism or DLD absorbed serotonin more rapidly than the platelets of normal children, indicating that nerve cells in the brain also are hyper-responsive to the chemical in both of these groups.

The researchers also found that platelets of identical twins (four sets participated in the study) reacted similarly to serotonin. In one set of fraternal twins, and two non-twin brothers, no similarities between siblings were found.

The researchers "speculate that autism and DLD have a very close connection in the genesis of illness, and...that some cases of language abnormality seem to be linked genetically with autism."

"Kinetics of 5H-serotonin uptake by platelets in infantile autism and developmental language disorder (including five pairs of twins)," Takemi Katsui, Masahide Okuda, Sagako Usuda, and Takeshi Koizumi; *Journal of Autism and Developmental Disorders*, March 1986, Vol. 16, No. 1, pp. 69-76. Address: Takemi Katsui, Department of Psychiatry, School of Medicine, Niigata University, Asahimachi 1, Niigata-shi 951, Japan.

CT scans show ventricle abnormalities

Computerized x-rays (CT scans) of autistic and normal children indicate that the width of the third ventricles in the brains of autistic children increases with age, according to a study by Hoshina et al.

An enlargement of the ventricles, which are fluid-filled cavities within the brain, can indicate atrophy of other brain structures. The researchers say their findings suggest a progressive disorder of the thalamus, hypothalamus or mid-brain surrounding the third ventricle.

They note that deterioration of these brain structures might explain why some autistic children "begin to have epileptic seizures or lose their excellent intellectual or motor abilities" as they grow older.

"Computed tomography of the brain in children with early infantile autism," Yoshihiko Hoshino, Taei Manome, Motohisa Kaneko, Yuko Yashima, and Hisashi Kumashiro; *Folia Psychiatrica et Neurologica Japonica*, Vol. 38, No. 1, 1984, pp. 33-43. Address: Yoshihiko Hoshino, Department of Neuropsychiatry, Fukushima Medical College, Sugitsuma-cho 4-45, Fukushima-shi, Fukushima-ken 960, Japan.

Early speech loss investigated

Researcher Hiroshi Kurita has found that autistic girls are more likely than boys to experience a total loss of meaningful speech before the age of 30 months.

The study, which involved 261 children, also indicated that autistic children who experience speech loss — even if speech is regained later — tend to function at a lower level than those who do not lose their speech abilities.

Because no difference was found in the early development of the children with speech loss (37.2% of the total study group) and the children without this symptom, the researcher speculates that "speech loss itself may be a manifestation of some underlying regressive change" which may affect subsequent speech and mental development.

"Infantile autism with speech loss before the age of thirty months," Hiroshi Kurita; *Journal of the American Academy of Child Psychiatry*, 1985, Vol. 24, Issue 2, pp. 191-196. Address: Hiroshi Kurita, Division of Social Psychiatry, Psychiatric Research Institute of Tokyo, 2-1-8 Kamikitazawa, Setagaya-ku, Tokyo 156, Japan.