# Harmful side effect of psychiatric drugs treated with vitamins E, B6

Neuroleptic malignant syndrome (NMS) is a fairly rare but serious side effect of many psychiatric drugs. Symptoms of the disorder include rigid muscles, altered consciousness, high fever, and hypertension. While the condition usually can be reversed, NMS often is fatal.

Although NMS can be treated with drugs, S. M. Dursun and colleagues note that "drug treatments should be used with extreme caution especially in elderly patients with concomitant medical illness since these drugs may cause further deterioration." A less dangerous alternative, they suggest, is treatment with vitamin E and vitamin B6.

The researchers report on a recent case involving a 74-year-old woman with schizoaffective disorder, who developed NMS during treatment with risperidone and other drugs. Dursun et al. treated the woman with 1600 IU/day of vitamin E and 200 mg/day of vitamin B6, because they regarded drug treatment as too dangerous given the woman's fragile medical condition.

The researchers report that their patient fully recovered from NMS. "Interestingly," they say, "her brief psychiatric rating scale [a measure of psychiatric symptom severity] also decreased from 74 down to 45."

Vitamin E also is being used to treat tardive dyskinesia (TD), another neurological disorder caused by psychotropic drugs (see ARRI 10/2, 8/3). Some researchers speculate that vitamin therapy reduces drug-induced neurological symptoms because it reduces the damage done to the brain by free radicals. This would explain, Dursun and colleagues say, "why advanced age, smoking, and alcohol abuse, which are all associated with increased radical production or damage, are risk factors for TD."

However, they say, there also is evidence that vitamin E can protect against drug-induced hypersensitivity of the brain's dopamine system. Dursun et al. believe this could explain why their patient's psychiatric symptoms, as well as her NMS symptoms, improved when she received vitamin therapy.

Given their findings, the researchers say, "it is interesting to postulate whether the use of vitamin E could help prevent recurrence of NMS in people who require neuroleptics and yet are sensitive to even the newer antipsychotics." They note that one large scale study showed an unusually low rate of tardive dyskinesia in patients using neuroleptic drugs for long periods but also receiving high doses of vitamins including vitamin E.

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"High-dose vitamin E plus vitamin B6 treatment of risperidone-related neuroleptic malignant syndrome," S. M. Dursun, O. J. Oluboka, S. Devarajan, and S. P. Kutcher; *Journal of Psychopharmacology*, Vol. 12, No. 2, 1998, pp. 220-221. Address: S. M. Dursun, Department of Psychiatry, Psychopharmacology Unit, Dalhousie University, Halifax, Nova Scotia, Canada.

# Tetanus and autism

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lems, Bolte speculates, may be mild manifestations of tetanus symptoms.

• In the brain, tetanus neurotoxin causes "long-term and severe inhibition of neurotransmitter release." This could explain findings that autistic children have abnormal levels of neurotransmitters.

• There are "some striking similarities," Bolte says, "in the neuronal damage described in autopsy studies [of autistic individuals] and those observed in neurons intoxicated with tetanus neurotoxin." In addition, she notes, inhibitory neurons that release the neurotransmitter GABA are a preferred target for tetanus neurotoxins—and the Purkinje cells of the cerebellum, which often appear highly abnormal in autistic individuals, are inhibitory neurons that release GABA.

• Tetanus infection produces a substance called tetanolysin, which could damage the intestines and increase intestinal permeability—thus allowing larger-than-normal food molecules to enter the bloodstream, causing immune reactions (and, some researchers speculate, neurological symptoms). Previous research indicates that many autistic individuals have increased intestinal permeability.

Bolte also notes that tetanus infection of the intestines leads to the formation of toxic compounds called phenols, and studies of autistic individuals have detected markedly elevated levels of the phenolic metabolite DHPPA. Several autistic children with high DHPPA levels, Bolte notes, "have shown a significant reduction in stereotyped behaviors when treated with antimicrobials effective against intestinal *clostridia*"—a genus of bacteria including tetanus. The children became more sociable, spoke more, improved their eye contact, and were less hyperactive and hypersensitive. Bolte adds, "Parents also noted that regression occurred very quickly" after treatment was discontinued.

Given these findings, Bolte says, "Parents, doctors, and researchers must combine efforts to determine if some people diagnosed as autistic are actually suffering from unrecognized forms of subacute tetanus."

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"Autism and *Clostridium tetani*," Ellen R. Bolte; *Medical Hypotheses*, Vol. 51, 1998, pp. 133-144. Address: Ellen R. Bolte, 705 Misty Creek Drive, New Lenox, IL 60451.

# *'Theory of mind' deficit investigated, novel teaching technique helpful*

Autistic individuals have difficulty understanding that other people have thoughts and feelings. This problem, called a "theory of mind" deficit, makes it hard for autistic people to communicate or to predict other people's behavior.

But is this deficit specific to autism? To find out, Peter Muris and colleagues recently tested three groups of children (150 in all). One group was identified as having pervasive developmental disorder. Another group was not disabled, but was labeled as "socially immature" because the children exhibited aggression, bullying, shyness, introversion, or other behavior problems. A third group of non-disabled children, with no significant behavioral or IQ problems, served as controls. Half of the children in each group were three years old, and the other half were six.

The researchers found that in general, three-year-olds in all three groups had difficulty understanding a theory-of-mind test called a "false beliefs" test. (In this test, the researcher presents a candy box to the child, shows the child that the box actually contains a pencil, and then asks what another person will believe is in the box—the correct answer, of course, being "candy" rather than "a pencil.") When six-year-olds were tested, however, only the control group consistently answered the question accurately. Both the children with PDD and the socially immature children solved the problem correctly less half the time. Performance on the test was strongly linked to IQ.

The researchers conclude that "deficits in theory of mind underlie social skills problems," and that a theory-of-mind deficit may underlie not just autism or other autistic-like disorders, but also some cases of childhood aggression and social anxiety.

**'Beliefs are like pictures'**

In earlier research, J. G. Swettenham, Simon Baron-Cohen and colleagues investigated the practical application of an interesting observation: that while autistic children don't understand mental representations well, they understand *photographic* representations. This skill, the researchers speculated, might help autistic children overcome their theory of mind deficits in some situations. "For children with autism," they say, "[photos] may be the closest approximation to what beliefs are actually like, if they cannot conceive of beliefs themselves."

Working with eight autistic children, the researchers first used cameras and teacher demonstrations to show the children that

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