Self-injury: problem behavior, or seizure symptom?

The question baffles parents and professionals dealing with autistic individuals who hit, bite, scratch and slap themselves, sometimes to the point of severe injury: why do so many autistic people hurt themselves?

Researchers have many theories: perhaps self-injury provides sensory stimulation or an "opioid high" from the chemicals the body produces in response to pain. Maybe self-injurious individuals are frustrated at being unable to communicate. Maybe they want attention, or want to be left alone, or want to avoid an unpleasant task.

Now Canadian researcher A. Gedye offers a very different theory. Maybe, Gedye suggests in an intriguing article in the *Journal of Clinical Psychology*, self-injurious behaviors aren't "behaviors" at all, but rather symptoms of temporal lobe seizures.

Earlier, Gedye speculated that "many symptoms characteristic of autism fit the clinical picture of frontal lobe seizures," and that the symptoms of Tourette syndrome also might be caused by such seizures [see ARRI 5/1]. Gedye noted that movements such as head turning, echolalia, tooth grinding, grimacing, hand flapping, staring, twirling, laughing or screaming, toe walking, and noisy breathing are common in both autism and frontal lobe seizures, and that frontal lobe disorders (with or without seizures) can cause other autistic-like symptoms such as attention deficit, hyperactivity, obsessive preference for sameness, and abnormalities in speech pitch and intonation.

Now Gedye suggests that scientists "consider the possibility that certain self-injurious movements are involuntary phenomena," an idea which has also been suggested by U.S. researcher Thomas Gualtieri.

Gedye notes that self-injurious behavior (SIB) occurring during seizures—including scratching, slapping, hitting, and skin picking—is a well-documented phenomenon. Frontal lobe seizures can occur with no loss of consciousness, and can occur almost continuously; "this pattern of frequency," Gedye says, "could describe the repetitive, at times continuous, self-injurious movements in severe patients."

Abnormal discharges in the motor cortex of the brain, Gedye says, "can result in simple muscle contraction or in full movements." Some nerves control many movements; for instance, the median nerve controls "actions as diverse as fingers gouging the thumb, pill-rolling, hand pinching flesh on cheek/neck, wrist flapping, and hand slapping head."

Gedye notes that self-injury takes remarkably consistent forms across cultures and IQ ranges—an indication that SIB is biologically, not environmentally, controlled. Furthermore, retarded individuals blind from birth make the same types of abnormal movements (including self-injurious actions) as sighted individuals, even though they could not have learned these actions by imitation.

Self-injury usually involves the head, mouth, and hands; these areas are represented by a much greater number of cells in the cortical motor area of the brain than other body areas, and thus are the most likely areas to be affected by abnormal discharges in the brain. Many people who head-bang don't slap themselves, and vice versa, Gedye notes; this may be caused by abnormal discharges in different cortical areas affecting different nerves.

While theories that SIB is caused by frustration, attention-seeking, or inability to communicate have gained in popularity in recent years, Gedye is skeptical, noting that "persons diagnosed with Tourette Syndrome who have normal intelligence, yet severe self-injurious movements, do not perform these actions to get attention or communicate nonverbally. They indicate clearly that these are involuntary events," and often ask for help in preventing them.

Treating autistic children with anti-convulsants may not affect SIB, Gedye says, because such medications do not always reduce nonconvulsive seizures originating in the frontal lobes. Conversely, behavior modification may help; "researchers have used behavior management successfully to reduce minor motor seizures in children," Gedye says, "and also to reduce myoclonic and grand mal seizures." Such cases have been shown not to be faked "pseudo-seizures" but real seizures. Seizures can be brought on by stress, Gedye adds, so behavior modification measures that reduce stress, either directly or indirectly, could reduce seizures and related SIB.

Gedye notes that some drug treatments that affect the brain's response to serotonin have been shown to reduce SIB. "If certain self-injurious and certain 'aggressive' movements are indeed due to neurochemical/neurological disturbances," Gedye says, "then we can develop treatments based on this understanding and avoid approaches that ascribe intentionality to involuntary neurological events."

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"Anatomy of self-injurious, stereotypic, and aggressive movements: evidence for involuntary explanation," A. Gedye, *Journal of Clinical Psychology*, November 1992, Vol. 48, No. 6, pp. 766-778.

Update: dietary treatment of autism, epilepsy

New studies add to the evidence that some cases of autism and epilepsy may be linked to inborn immune or metabolic disorders, and that dietary interventions may be helpful.

Italian researcher Giuseppe Gobbi recently reported in *The Lancet* that 24 of 31 patients with epilepsy and cerebral calcifications of unexplained origin were found to have celiac disease. Celiac disease, also known as sprue, occurs when the body's immune system becomes sensitized to the protein gluten (found in wheat, oats, rye, and some other cereal grains) and reacts in the same way as it would to a virus or other invader. The rare disorder causes the lining of the small intestine to deteriorate, leading to weight loss, vitamin and mineral deficiency, weakness, bone and abdominal pain, and other symptoms. In some cases—including Gobbi's patients—celiac disease is not easily detected because overt physical symptoms remain mild.

Gobbie's epileptic patients with celiac disease had responded poorly to anticonvulsive drugs. The researchers found that putting the patients on gluten-free diets was helpful, but only when the diets were begun shortly after patients developed epilepsy.

Gluten implicated in autism

Earlier reports suggest that a different defect may interfere with the breakdown of gluten, casein (the principal protein in milk), or other proteins, leading to symptoms of autism.

Norwegian researcher Karl Reichelt and colleagues theorize that some autistic children have a defect of two or more peptidases (enzymes that convert protein fragments called peptides to amino acids). When the breakdown of peptides such as casomorphins and gluteomorphins (metabolic products of gluten and milk) is incomplete, Reichelt et al. speculate, "opioid" peptides—which have opium-like effects on the brain—may enter the bloodstream and cross the blood-brain barrier. High opioid levels have been linked to isolation, self-injury, learning disabilities, and failure to bond.

English researcher Paul Shattuck and coworkers report evidence of such a defect in peptide breakdown: 80 percent of the 50 urine samples of autistic subjects they have tested have shown peptide abnormalities. The large amounts of peptides detected in urine samples from autistic subjects, they note, "are unlikely to have emanated from central nervous system production and are much more likely to be the product of the breakdown of protein from food or body storage systems."

Normally, the researchers say, the blood-brain barrier would prevent the entry of significant amounts of peptides into the central nervous system unless there is "a very severe excess of particular peptides." However, the researchers theorize that in those autistic individuals with normal peptide levels, damage to the blood-brain barrier could allow opioid peptides to cross this barrier and disrupt normal thought processes. Illnesses that can impair the blood-brain barrier include meningitis, herpes, and encephalitis—all of which have been associated with autism.

Reichelt et al. found peptide increases in nearly 90% of the autistic children they tested. Further evidence implicating an abnormal reaction to gluten and casein included bovine casomorphin immunoreactive peptides in urine and dialysis samples, and increased IgA antibodies against casein and gluten.

Shattuck's team say their research offers clues as to why drugs such as naltrexone (which blocks the effects of opioids) are some-

continued on page 7