Given many difficulties in getting all the information necessary for an adverse event report from an online posting, and in verifying the identity and motivation of the poster, mining the Internet for such reports may not be a good use of FDA or manufacturer resources, said Diana Zuckerman, PhD, president of the National Research Center for Women & Families. Instead, Zuckerman argued, the FDA should boost the profile of its MedWatch reporting program online by making a link to the system ubiquitous on medical product-related Web sites and Web searches. Additionally, she said, the agency should make the MedWatch questions more consumer friendly.

Many of the proposals made by both industry and consumer groups would require greater resources at the FDA, and there was a consensus among consumer advocates that user fees should be created to defray the additional costs of more aggressively monitoring Web-based promotion.

In assessing all the proposals, the FDA should remember the public health implications of information consumers receive about medical products, Frosch advised.

"Prescription drugs are a different type of consumer commodity," Frosch said. "If you purchase the wrong bar of soap, that's not likely to have any effects on your health, but if you end up with the wrong prescription drug, that very well could have some effects on your health that you would want to know about." □

Experts Describe "Spectrum" of Epilepsy

Tracy Hampton, PhD

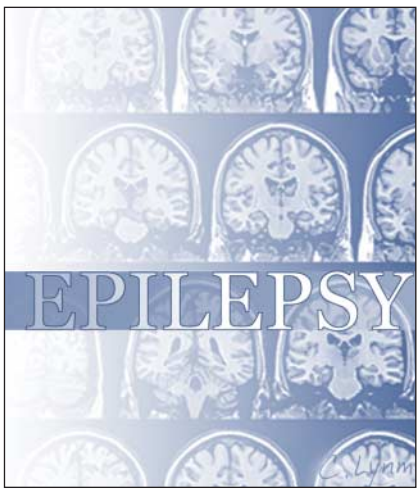
BOSTON—As researchers continue to uncover complex relationships between epilepsy and a host of cognitive, behavioral, psychiatric, and other neurological disorders, they argue that epilepsy should be considered a spectrum disorder. Such a characterization could increase awareness and improve the treatment of this serious brain disorder, which affects 50 million people worldwide.

"Epilepsy is more than seizures. Seizures are just the tip of the iceberg," said Frances Jensen, MD, professor of neurology at Harvard Medical School and director of epilepsy research at Children's Hospital in Boston. Patients' day-to-day problems with learning, memory, and mood are equally troubling, she noted.

PROBING CONNECTIONS

Jensen and others in the field are calling for additional funds for research into the connections between epilepsy and other conditions, as well as more medical training related to epilepsy. She and other experts presented their case at the 63rd Annual Meeting of the American Epilepsy Society, held here in early December.

Recent evidence suggests that epilepsy and seizures may be components of such conditions as depression, autism, and Alzheimer disease, and the cognitive comorbidities of these disorders may be linked by shared mechanisms (Kanner AM. *Curr Neurol Neurosci Rep*. 2009;9[4]:307-312; Spence SJ and Schneider MT. *Pediatr Res*. 2009;65[6]:599-606; Palop JJ and Mucke L. *Arch Neurol*. 2009;66[4]:435-440). "The disruptions in function, or mechanisms, that cause an apparently normal brain to have seizures may produce other effects as well, which may precede and outlast the active phase of epilepsy," said Anne Berg, PhD, professor in biologic sciences at Northern Illinois University in DeKalb.



In light of evidence that epilepsy and seizures may be components of other neurological diseases, some researchers say epilepsy should be considered a spectrum disorder.

Seizures themselves can cause direct harm to the brain, and they also may have indirect effects, through sleep deprivation as well as social stigma and other negative interpersonal reactions to epilepsy that increase patients' risk for emotional disturbances. Still, many patients have poor long-term quality of life despite seizure control, suggesting that comorbid conditions can continue to progress even in the absence of seizures.

Investigators suspect that the mechanisms underlying seizure-induced cognitive and behavioral dysfunction may include a variety of cellular and molecular changes in the brain, including alterations in excitatory and inhibitory neurotransmission pathways. Imaging studies are beginning to point to specific structural and functional brain abnormalities associated with epilepsy comorbidities. Greater insights into these abnormalities could help researchers design new therapies.

While investigators suspect that epilepsy may predispose an individual to other neurological conditions, the opposite may also be true. "It's often a chicken-and-egg question," said Jensen. For example, epilepsy is more frequent in individuals with Alzheimer

For Further Information

The American Epilepsy Society, a scientific and professional organization, maintains a Web site that features various tools for professional development, including an epilepsy education program designed for use by students and faculty, archived symposia from the society's annual meeting, and links to resources for researchers (https://www.aesnet.org/).

The National Institute of Neurological Disorders and Stroke (NINDS) maintains an epilepsy information page with answers to common patient questions on the condition, as well as links to professional and patient advocacy organizations and to epilepsy-related NINDS publications and information (http://www.ninds.nih.gov/disorders/epilepsy/epilepsy.htm).

The US Centers for Disease Control and Prevention (CDC) provides basic data and statistics on epilepsy and provides links to the agency's funded studies, programs, and resources, along with patient information and epilepsy-related activities at the state level (http://www.cdc.gov/epilepsy).

The Epilepsy Foundation, a national voluntary agency dedicated to the welfare of people with epilepsy in the United States and their families, maintains a site with links to patient information, advocacy efforts, and news about epilepsy. The site also provides information about the foundation's research program and grant and fellowship opportunities (http://www.epilepsyfoundation.org/).

disease, while those with epilepsy have a greater risk of developing this degenerative brain disorder. Likewise, people with depression are more likely to develop epilepsy, while individuals with epilepsy are often depressed.

In children, epilepsy can influence quality of life, school performance, and social and family interactions. "Children with epilepsy are at increased risk for learning and behavior problems compared to children with other chronic illness, siblings, or controls," said Amy Brooks-Kayal, MD, professor of pediatrics at the University of Colorado and chief of child neurology at Children's Hospital in Denver. "The kids, their parents, and numerous studies tell us that these problems are often more disabling than the seizures," she added.

A Cleveland Clinic study that was presented at the conference found that 40% of 116 children with chronic epilepsy had mood disorders, 31% had attention-deficit/hyperactivity disorder, 25% had anxiety disorders, and 14.7% had autism spectrum disorders. Because some of these children had been previously evaluated but remained untreated secondary to their epilepsy, the authors advocated for including psychiatrists in epilepsy management. "Integrated clinical service teams in epilepsy are essential to achieving the goal of evidence-based medicine in this population of patients," said first author Tatiana Falcone, MD, PhD, an associate staff physician at the Cleveland Clinic Neurological Institute.

WIDE SPECTRUM

The variations in seizure types, treatments, causes, disabilities, and outcomes support the rationale for redefining epilepsy as a spectrum disorder. The type of seizure and its symptoms depend on the brain region affected. Treatments—including anticonvulsant medications, surgery, and neurostimulation therapy—have different effects on different patients, while approximately 30% of cases are refractory to treatment. Causes of epilepsy may include genetic factors, brain infection, head trauma, brain tumors, and stroke.

At the extremes, patients may lead full, productive lives or be completely dependent on others. "There are rocket scientists with epilepsy who function very well, and there are people who are suffering and are institutionalized," said Jensen. Outcomes are similarly diverse: many children who develop the disease will outgrow it, but in some rare cases, their condition may be progressive and lead to premature death. Sudden unexplained death, similar to sudden infant death syndrome, also occurs in epilepsy.

Because epilepsy can have such a varied effect on individuals, experts are urging primary care physicians—who are often the first clinicians to see patients with the disease—to be vigilant in looking for its signs.

"Doctors need to have a low threshold to probe for epilepsy," said Orrin Devinsky, MD, director of the Comprehensive Epilepsy Center at New York University Langone Medical Center in New York City. "Too often, diagnosis is delayed." This can be particularly detrimental if infantile spasms, which are associated with an epilepsy syndrome of infancy and childhood, are missed. "If you don't catch that window of opportunity, that person's life could be ruined," said Devinsky.

Early diagnosis and aggressive treatment raise the potential for success in managing seizures. The risk of accidents, dangerous prolonged seizures, and sudden unexplained death in epilepsy increases when the disorder goes untreated or when a patient stops taking prescribed medications without proper medical guidance.

Devinsky and Jensen say that the field of epilepsy is where cancer was 15 years ago: the stigma of the disease is lessening, and the mechanisms involved are being studied with increasing intensity. Greater effort is needed, though, to properly screen and treat patients.

"More education needs to be out there so the front line knows when to get patients to epilepsy centers," said Jensen. She noted that most medical students hear only 1 or 2 lectures on epilepsy during their schooling. It's frustrating, she said, considering that epilepsy is such a common neurological disorder in children and adults. Its links to other medical conditions make it an even more important consideration for all physicians. □