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In Women with Epilepsy, Seizures Often Begin During Puberty, Suggests Analysis of National Registry

WASHINGTON, D.C. - Many women with epilepsy first develop seizures during puberty, implicating high levels of certain hormones produced during that time of life, suggests an analysis of a large national epilepsy registry being presented at the [American Epilepsy Society 71st Annual Meeting](#).

While researchers are aware that seizures often begin with the onset of menstruation, the new study shows the connection is even more powerful when looking beyond the first menstrual period to the eight-year span of puberty. Analyzing more than 1,100 women in the registry, researchers determined 49 percent had their first seizure between two years before and six years after their first menstrual periods.

"The levels of some hormones in the blood increase 10-fold during this time of life, including neuroactive steroids that affect the brain and make a seizure more likely," said Andrew G. Herzog, M.D., MSc, senior author of the study and director of the Harvard Neuroendocrine Unit of Beth Israel Deaconess Medical Center, Boston. "Clearly more seizures develop in girls during that period of time, so we need to begin looking at risk factors as well as potential treatments."

For the study, researchers reviewed data from the Epilepsy Birth Control Registry of 1,144 women with epilepsy (ages 18 to 47 years) who had provided reproductive information. They determined that 8 percent of the women first experienced seizures the year they had their first menstrual periods, which is four times greater than would be expected by chance. (Among the women in the registry population, the chance of seizure onset during any given year between birth and age 47 would be slightly more than 2 percent.) However, the 8 percent number is relatively small, meaning it is not a strong predictor of seizure onset. The researchers wondered if they could better predict seizures by looking at a span of years, and found 49 percent of the women had experienced their first seizure during the range of two years before and six years after the beginning of menstruation, which is two-and-a-half times greater than would be expected by chance.

During puberty, the body begins producing massive levels of hormones, which prompt sexual maturation. Some of these hormones are neuroactive, meaning they can "excite" brain cells, which increases the risk of a seizure, particularly those with other risk factors. In the first two years after menstruation begins, girls ovulate (produce eggs) in only about half of the menstrual cycles. In cycles in which they don't ovulate, they produce estradiol (estrogen), which increases the risk of convulsions from a seizure, but not progesterone, which decreases the risk. Previous research by Dr. Herzog found women with epilepsy are 30 percent more likely to have convulsive seizures during menstrual cycles in which they don't ovulate.



The incidence of seizures increases in boys during late childhood and adolescence as well, likely also implicating hormones, Dr. Herzog said.

The next step is to assess girls who may be at risk for developing seizures, such as those who had seizures related to a fever or suffered a head injury. Those at risk could be more closely watched and potentially treated with medications such as steroids that can inhibit neuroactivity that leads to seizures, Dr. Herzog said.

“We need to look at the whole puberty process and this massive increase in hormone production,” said Dr. Herzog. “If we have a better idea of how hormones are acting on the brain, we can develop appropriate treatment.”

About the American Epilepsy Society

Founded in 1946, the American Epilepsy Society (AES) is a medical and scientific society whose members are dedicated to advancing research and education for preventing, treating and curing epilepsy. AES is an inclusive global forum where professionals from academia, private practice, not-for-profit, government and industry can learn, share and grow to eradicate epilepsy and its consequences.

For more information, visit the American Epilepsy Society online at aesnet.org. Join the AES Annual Meeting social conversation today by following [@AmEpilepsySoc](https://twitter.com/AmEpilepsySoc) on Twitter and use the hashtag #AES2017.

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