

Living with the Disease- Alzheimer's and Seizures

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Figure 1

As there is no cure for Alzheimer's disease, when an individual has moderate to severe Alzheimer's disease it is common to be prescribed Ebixa. Ebixa is considered an anti-dementia medication. Memantine is the active substance that belongs to the NMDA blockers, which are the medications that improve the transmission of nerve signals that help protect memory function. With dementia the brain functions deteriorate significantly, memory is affected, and patients forget many things, become disoriented and lose sense of time. Alzheimer's is progressive therefore, eventually the individual that suffers from the disease will have no ability to care for themselves. Ebixa protects the receptors in the brain that are associated with the functioning of memory which improves the signal transmission in the brain and memory becomes stronger.

I did see improvement with my mom when she took this medication, in terms of daily functioning, however with increased use my mom developed a non-common side-effect which is seizures. I had never witnessed a seizure, until my mom started developing them and when she started developing them, she had lost all her language function. When we went to the doctor, I had to try to describe what was happening and I had no clue. There was no way to figure out what was causing the seizures, she was not getting them at a time of day or even regularly. She could have one and then not have another one for 6 months, which is why it took a while to even figure out that it was a side effect of Ebixa. When she started to develop seizures more frequently, she discontinued the use of Ebixa permanently and every other medication.

I had no clue what seizures no one in my family suffered from Epilepsy or any other seizure disorder. It however makes sense on why my mom would develop seizures as it is also an abnormality of the brain.



Figure 2

The brain has billions of neurons that create and receive electrical impulses, which communicate with each other. When an individual has a seizure, there is an abnormal and excessive electrical activity in the brain which can cause changes in awareness, behaviour and abnormal movements. This activity typically lasts only a few seconds to minutes.

A person who has Epilepsy has a risk of recurring epileptic seizures, however not everyone who has a seizure has epilepsy, like my mom. Apparently, non-epileptic seizures can be caused by low blood sugar, anxiety attack, or even fainting.

The most common seizure type called tonic clonic or grand mal seizure is a convulsion. The person may stiffen and have jerking muscle movements which could involve biting their tongue, causing bleeding, or frothing at the mouth.

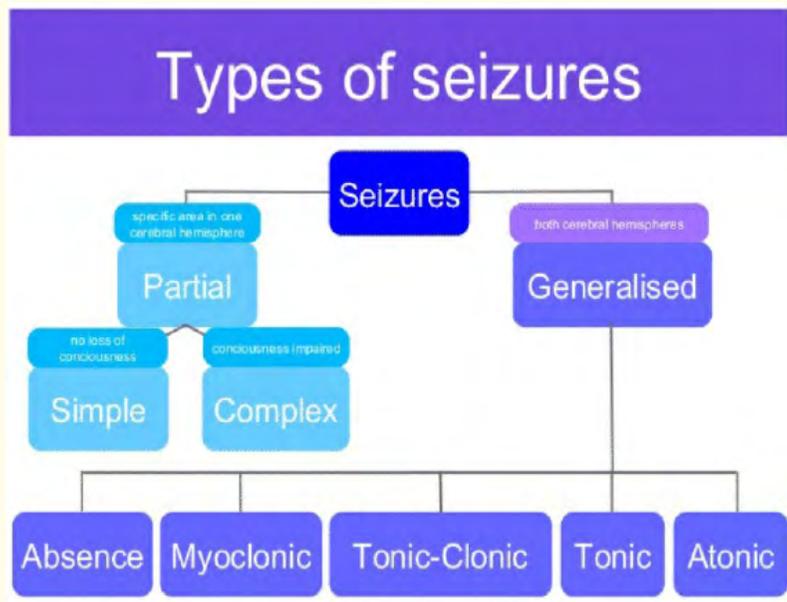


Figure 3

Other seizure types do not involve the convulsions and the shaking movements may be isolated to one arm or part of the face, the person may suddenly stop responding and stare for a few seconds, sometimes with chewing motions or smacking the lips. With my mother, her seizures do not involve convulsions, she stops responding and starts breathing heavily and bites her lip, sometimes very hard. One of her seizures over two years ago, was extremely bad, she was non-responsive and had to be rushed to the hospital. The doctor put her through all the tests, and stated that all her organs were healthy, however her brain had seriously atrophied and that his thoughts were that she would have more frequent seizures and may die from one. This was the start of her palliative journey.

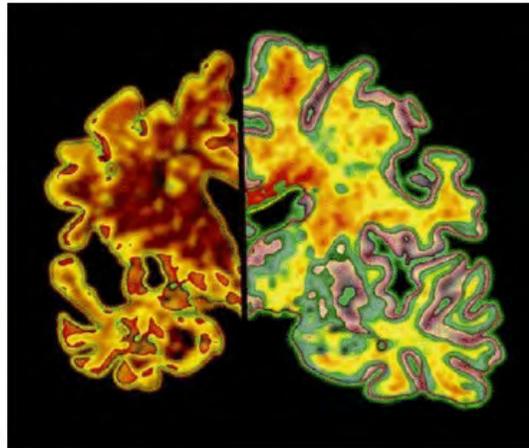


Figure 4

It is estimated that people with Alzheimer's disease have two to six fold increase in the risk of seizures compared to the general population. There is a 10 percent to 26 chance that individuals with Alzheimer's disease will develop seizures. It is still not clear which mechanisms trigger the effect. Although it may seem completely plausible that Alzheimer related seizures are directly associated with the degeneration of the brain, there is a suggestion that it is directly associated to the beta-amyloid [1].

Amyloid precursor protein (APP) is the precursor protein and Beta-amyloid is a fragment of APP. As APP is broken down, specific chemical by-products are released into the brain which can overexcite and effectively overload the nerve pathways. As the disease advances, the build-up of these by-products can cause nerve cells to fire unusually, which in effect triggers seizures.

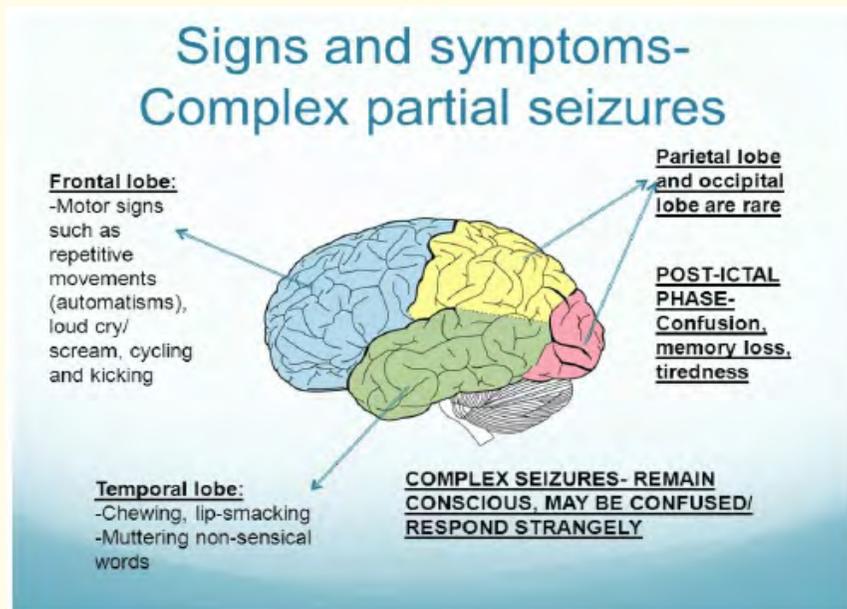


Figure 5

Individuals with Alzheimer's disease typically suffer from partial complex seizures or secondary generalized tonic-clonic seizures. In partial complex seizures, which are also called focal onset impaired awareness seizures, the individual becomes disoriented and can engage in unconscious actions such as fumbling, lip-smacking, wandering or picking up clothing.

With secondary generalized tonic-clonic seizure, a partial seizure, affecting one side of the brain evolves into a generalized seizure, that affects both halves of the brain, consequently causing a full body convulsion.

Besides the biochemical triggers for seizures there appear to be other factors that can place an individual at risk. Presenilin 1 (PSEN1) and Presenilin 2 (PSEN2) which are common genetic mutations that appear in individuals with Alzheimer's-related seizures. These mutations are genetic and play a significant role in the production of amyloid precursor protein (APP). Individuals that are diagnosed with early-onset Alzheimer's (occurring before the age of 65) like my mom, are more likely to experience seizures, although the seizures will typically commence during the late stages of the disease.

This is now why it is important to understand the brain and the intricate details of the it. This is exactly what happened to my mother. She was mis-diagnosed with Atypical Alzheimer's disease at the age of 57. Atypical Alzheimer's disease of course does not exist, however in the year 2000, where there was little information on the disease, and my mother's age, they could not explain why there were certain things that my mother could still do, that according to her M.R.I. Scans, seemed impossible. They could not figure out why she had full dexterity. Her dexterity was not impacted, which created confusion on what type of Alzheimer's disease she had. To date, she still has the diagnosis of Alzheimer's disease going on 18 years later, although again, doctors, palliative care nurses cannot understand how she still has the strength that she does and that things that should be shutting down at this point are not.

There is a suggestion that non-convulsive seizures, such as absence seizures that are seen with those that suffer from epilepsy, could also be responsible for certain Alzheimer's disease behaviours such as amnesic wandering, this is where some individual wanders off with out memory or knowledge of doing so. Alzheimer's disease is such a complicated disease, and the atrophy is one person's brain, may present differently in someone else's. The same goes for seizures, not everyone with Alzheimer's disease will experience a seizure. Individuals that do develop seizures will have difficulty in diagnosing them since the behaviours are like the disease itself, especially with the partial complex seizures where an individual can suddenly experience a blank-out and exhibit abnormal behaviour.

With individuals that have Alzheimer's disease a blood and imaging test can be used to diagnose seizures. If the seizures are frequent an electroencephalogram or EEG may assist in identifying the seizure type and cause. If there is a diagnosis of a seizure, treatment is usually anti-epileptic medications such as Tetrytol carbamazepine, Depakote valproic acid, Neurontin gabapentin, and Lamictal, lamotrigine. Any anti-epileptic should be used with extreme caution, as they could possibly enhance the symptoms of dementia. I did not put my mother on any of these medications, just for that fact and she was non-verbal, which made it more difficult.

If an individual with Alzheimer's disease is suffering from seizures, there are ways to prevent injury. In most cases, seizures are not life-threatening.



Figure 6

As difficult as it is when you witness a seizure, the first thing you should do is to remain calm. If you can, try to note the time. This may be difficult for individuals that have Alzheimer's and have partial complex seizures. However, it is important to time the seizure from the beginning of the convulsion to the end. A seizure that lasts more than five minutes will be treated differently than one that lasts longer. Seizures are very traumatic, and a clock is helpful to establish the duration of the seizure. Make sure there is nothing sharp around the person that is experiencing the seizure. Loosen tight clothing around the neck and pad under the head with a pillow. If possible roll the patient to their left side and do not put anything in their mouth. If the seizure lasts longer than five minutes, call 911, if the individual is non-responsive (like my mother was) call 911. If the person stops breathing call 911 [2-4].

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