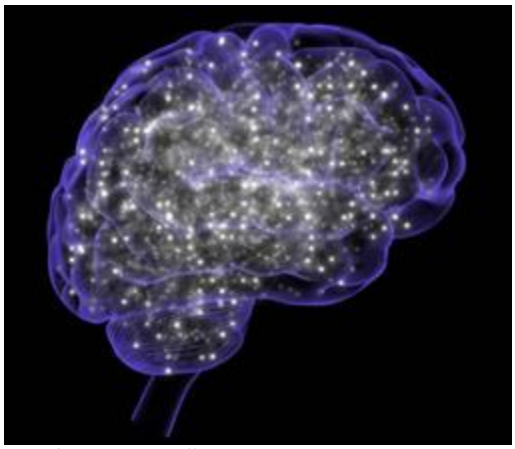
Stimulation of the ventral pallidum for the treatment of epilepsy

VP-DBS: Pioneering Seizure Control and Enhancing Safety in Epilepsy Management

Background:



Source: https://www.google.com

Antiepileptic drugs are the primary treatment for epilepsy, yet around 30% of patients experience intractable seizures, with temporal lobe epilepsy (TLE) being the most common form. TLE can lead to generalized tonic-clonic seizures, which pose significant risks, including severe injuries and cardio-respiratory dysfunction, contributing to sudden unexpected death in epilepsy (SUDEP) at a rate of about 1 in 1,000 cases. While some patients may benefit from resective surgery, many do not achieve seizure freedom, and existing therapies like vagus nerve stimulation and responsive neurostimulation offer limited efficacy. Consequently, there is a pressing need for more effective treatments that reduce seizure frequency and lower the risk of SUDEP in individuals with intractable epilepsy.

Technology:

Scientists at Albany Medical College have developed deep brain stimulation of the ventral pallidum (VP-DBS) as a novel approach to managing epilepsy. In pilocarpine-treated rats, 50 Hz VP-DBS prevented partial and generalized seizures, reduced the frequency and severity of generalized tonic-clonic seizures (GTCSs), and significantly increased seizure latency. It also blocked seizure spread from the forebrain to the brainstem, enhanced neuronal firing rates, and preserved cardiovascular function, potentially lowering the risk of sudden unexpected death in epilepsy (SUDEP). VP-DBS appears to modulate key neuronal circuits involved in seizure propagation. Overall, VP-DBS offers a promising strategy for treating intractable epilepsy and improving patient safety by preserving vital brainstem functions. Preliminary data strongly suggests that VP-DBS is more effective for seizure control than recently FDA approved target anterior thalamus DBS in a direct comparison. Human testing in VP is on the horizon for assessing adverse effects and efficacy for epilepsy.

Intellectual Property

US10596376B2

Technology Readiness

Ready for licensing

Advantages:

- **Effective Seizure Prevention**
- **Increased Latency**
- **Enhanced Neuronal Activity**
- **Preservation of Cardiovascular Function**

Applications:

- **Closed-Loop Systems**
- **SUDEP Mitigation**
- **Broader Neurological Applications Research**
- **Treatment of Intractable Epilepsy**

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Technology # AMC-2018-01

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