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Optimizing deep brain stimulation parameters in intractable epilepsy: An EEG based innovative approach

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Deep brain stimulation (DBS) of anterior thalamic nucleus (ATN) has established as an effective adjunctive therapy for patients with intractable epilepsy (IE) not suitable for epilepsy brain surgery and/or vagal nerve stimulation. The judicious selection of DBS parameters (DBSPs) plays a crucial role in the success of ATN-DBS. Conventionally, DBSPs are selected by trial and error requiring multiple sessions and hospital visits warranting a strong need for optimization of the DBSPs with objective assessment of its effects. The author presents an EEG-guided novel and superior approach to the selection of effective DBSPs targeted to induce EEG-desynchronization, which is known to exert potent antiepileptic influence with possibly possession of an additional anti-kindling effect that can suppress or even arrest the ongoing process of epileptogenesis in the patients with intractable epilepsy in addition to exercising control over the intractable seizures. It is further claimed that the innovative EEG-guided approach can successfully optimize the DBSPs resulting in (a) minimum sessions of DBSP adjustments, thereby reducing the frequency of hospital visits (b) minimum side effects and (c) minimum consumption of the device battery; thus, prolonging its life. Preliminary results of the clinical application of the novel approach in the selection of the DBSPs in a small case series have been very promising and encouraging despite which it is strongly recommended that well designed large sized studies are required for its validation and successful clinical outcome.

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