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Using QEEG-Guided Neurofeedback for Epilepsy Versus Standardized Protocols: Enhanced Effectiveness?

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Abstract This article briefly reviews some of the past EEG treatments of epilepsy and discusses how QEEG may potentially enhance effectiveness of this approach. Several cases are presented in support of this approach.

Keywords Epilepsy · Neurofeedback · EEG · QEEG

Sterman and his colleagues conducted the initial studies of neurofeedback in epilepsy. Sterman (2002) has reviewed this work up until 2000 and performed a meta-analysis of all studies up to that date. He found that 82% of patients demonstrated more than a 30% reduction in seizures. In all of those studies a standard, non-QEEG based, protocol was used, usually training to reward activity in the "SMR" range (11–14 Hz) at one or more central sites (C3, C4, or Cz). Although this approach has met with considerable success, complete cessation of seizures has been rare.

Walker and Kozlowski (2005) were the first to report a study using QEEG as a guide to neurofeedback training for people with intractable seizures. The QEEG findings included one or more focal slow abnormalities and one or more coherence abnormalities in all 12 patients. The approach to treatment involved five sessions of neurofeedback rewarding inhibition of slow activity in the areas where there was excess slow activity (1–10 Hz) and rewarding an increase in 15–18 Hz at the same time. We also rewarded normalizing coherence in the most significantly abnormal coherence pairs. Within 20–35 sessions, all the patients became seizure-free. They have remained so for an average of 7 years now (range 4–9). Two of them continue on a single anticonvulsant drug, for their fear of a seizure recurrence.

Since then, we have trained an additional twenty patients with intractable seizures. Eighteen of them are seizure-free, with two remaining on a single anticonvulsant drug. Two patients continue to have occasional seizures. One of these has several "miniseizures" daily in which she has momentary lapses of attention, but no longer has generalized seizures or loss of consciousness. The second patient has rare partial complex seizures (<l/mo.), but no longer has secondarily generalized seizures (she used to have several per week). The average followup is 4 years (range 3–7).

Another group we have treated is mothers with epilepsy who were controlled on anticonvulsant therapy, but who wanted to cease taking drugs because they wanted to become pregnant and feared the teratogenic potential of the drugs. We used the same approach in nine of these patients. All are now seizure free and have remained so for an average of 6 years (range 3–9).

We have also treated five patients whose seizures were controlled with anticonvulsants, but had intractable side effects from the drugs. Using the same approach all are now seizure-free off medication, for an average of 5 years (range 3–6).

Our results suggest enhanced efficacy for the QEEG approach as opposed to standard protocols. Direct comparisons cannot be made because patient populations differ and recent improvements in neurofeedback technology may have improved our results in comparison with older studies. In our center we had results similar to those obtained by Sterman when we used the standard protocols in years past. The apparent increased efficacy of QEEG

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training suggests this approach merits further consideration, by researchers and clinicians alike, even those who are refractory to multiple anticonvulsant therapy.

References

Sterman, M. B. (2002). Basic concepts and clinical findings in the treatment of seizure disorders with EEG operant conditioning. *Clinical Electroencephalography, 64*, 45–55.

Walker, J. E., & Kozlowski, G. P. (2005). Neurofeedback treatment of epilepsy. *Child and Adolescent Psychiatric Clinics of North America, 14*, 163–176.