Vagus nerve stimulation (VNS) is one currently used adjunctive neurostimulation therapy for refractory epilepsy. The purpose of this study was to determine the effects of neurostimulation on cortical lateral interactions manifest in the steady-state VEP. A further aim was to compare these effects with those found previously with adjunctive gabapentin treatment in which VEP indices of cortical lateral interactions were reversibly changed.

METHODS

PATIENTS: Six chronic VNS patients (3M, 3F; avg. age: 34.8 yrs).

Inclusion Criteria
- VNS treatment > 1 year
- Stable AED therapy > 1 month
- VA corrected to 20/40 or better OU

Exclusion Criteria
- Photosensitive seizures
- Ophthalmological disease that might affect VEPs
- Seizures within 24 hrs prior to VEP testing

CONTROLS: 21 age-matched normal subjects (15M, 6F; avg. age: 32.9 yrs).

Analysis & Results

We observed two differences between the VEP waveforms elicited by W/D-ON and W/D-OFF stimuli, as measured by their Fourier components. The fundamental response is absent in W/D-OFF (since it is a contrast-reversing pattern, the static region is present only in the W/D-ON configuration). Thus, interactions between these regions may result in differences between the VEP waveforms that the two stimuli elicit.

Summary & Conclusions

- Steady-state VEPs can be reliably recorded during the off-cycling of VNS neurostimulation, and responses were not significantly different from responses obtained when the stimulator is turned off for an hour.
- Compared to normal controls, both patient groups showed no difference in the facilitation index, but significantly less lateral suppression.
- With appropriate stimuli, the steady-state VEP is a noninvasive measure of the status of cortical interactions.

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http://www-users.med.cornell.edu/~jdvicto/vps.html