Patient characteristics and recording methods

Three patients with chronic brain injury and evidence of partial recovery of function:


**Patient 1**

- 32-channel EEG, augmented 10-20 montage
- 24-hr EEG, with video, per patient
- Selection of artifact-free segments based on visual inspection of EEG and video
- Eyes open, resting state

**Patient 2**

- 24-channel EEG, augmented 10-20 montage
- 15-s epochs for coherence data
- Eyes closed, resting state
- C1, C2, Fp1, Fp2, F7, F3, F4, F8, T3, T4, T5, T6, P3, P4, O1, O2

**Patient 3**

- 16-channel EEG, amplified 10-20 montage
- 15-s epochs for coherence data
- Eyes closed, resting state
- C1, C2, F7, F3, F4, F8, T3, T4, T5, T6, P3, P4, O1, O2

Sample EEG analyses

**Left Hemisphere**

Left Hemisphere Interhemispheric Right Hemisphere

Left Hemisphere Interhemispheric Right Hemisphere

Patient 1 had late spontaneous recovery of thalamocortical coherence patterns in the left hemisphere.

Patient 2 had left thalamic motion; evidence of thalamocortical coherence patterns is strongest in the right hemisphere.

Summary and clinical correlation of EEG analyses

The coherence of the hemispheric areas may be temporally correlated with the onset of clinical improvement, by supporting the hypothesis that thalamic coherence plays a role in the recovery of function.

**CONCLUSIONS**

- Population models of thalamocortical dynamics predict fluctuating patterns of cortical coherence and power.
- Multitaper spectral analysis, combined with principal components analysis, provides a rigorous means to identify these fluctuations.
- These fluctuations are present, to varying degrees, in three patients with chronic brain injury, and appear to correlate with the integrity of thalamocortical networks.

**REFERENCES**


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http://www-users.med.unc.edu/~jdvictor/vipas.html