

# TA-4 Electroencephalographic (EEG) Measurements of Long-Term Meditators: A Pilot Study

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**Abstract: Introduction** Alpha rhythm is an EEG correlate for a state of relaxed wakefulness best obtained with eyes closed, generally with higher voltage over occipital region. Meditation practices have gained increasing attention as a non-pharmacological intervention for mind relaxation. However, the effects of meditation on brain activity still need to be fully characterized. **Objective** To investigate frontal and occipital EEG wave pattern variations of long-term meditators before and during meditation **Method** Meditators with long-term (>5 years) experience in several meditation techniques participated in the study. EEG was recorded for 15 minutes in two phases; prior and during meditation, using the technique; Tranquil Wisdom Insight Meditation (TWIM) with eyes closed. Fast Fourier Transformed EEG signals of frontal region (AF<sub>3</sub> and F<sub>3</sub> channels) in six meditators and of occipital region (O<sub>1</sub> channel) in five meditators were extracted considering the clearness of signals. Raw power values and  $\log_{10} \mu V^2/Hz$  values of frontal and occipital regions respectively were analyzed with respect to multiple frequency bands and their percentage variations in energy levels. **Results** Average percentage energy variations were contributed by; Frontal-[(delta; 50% decrement), (theta; 10%, alpha; 33%, beta; 5%, gamma; 1%) increments], Occipital-[(gamma; 30.9% decrement), (theta; 3.7%, alpha; 20.3%, beta; 3.3%, delta; 3.5%) increments] **Conclusion** Frontal and occipital alpha power increment may suggest a mind relaxation effect, a signal analysis from other brain regions needs to be performed for confirmation. The increment may be due to TWIM or other meditation techniques, practiced in past or due to combination of both. This warrants comparative studies exploring differences between various approaches and techniques (i.e. *Samatha & Vipassana*) with larger sample size to delineate effects of meditation on brain activity.

**Keywords:** meditation; mind relaxation; EEG

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