

# Decreased resting gamma activity in adult Attention Deficit/Hyperactivity Disorder.

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World J Biol Psychiatry. 2018 Feb 19:1-33.  
doi: 10.1080/15622975.2018.1441547.

Abstract

## OBJECTIVES:

To delineate task-free gamma activity in adult ADHD and healthy control subjects based on high-density EEG recordings. Relationship of gamma activity with symptom severity was also examined, since gamma activity is considered as an index of network functions in the brain that underlie higher-order cognitive processes.

## METHODS:

Spontaneous-EEG was recorded in adult ADHD subjects (N = 42; 25 methylphenidate-naïve and 17 on methylphenidate treatment) and controls (N = 59) with eyes open. EEG absolute power gamma was investigated in the gamma1 (30.25-39Hz) and gamma2 (39.25-48Hz) frequency bands.

## RESULTS:

Gamma1 and gamma2 activity was diminished in ADHD compared healthy control subjects. The difference between ADHD and controls was the most pronounced in the right centroparietal region for both gamma1 and gamma2. Inverse associations were found between gamma1 and gamma2 activity and ADHD symptoms in centroparietal scalp regions.

## CONCLUSIONS:

Gamma activity is reduced in adult ADHD, and the reduction has a predominantly right centroparietal distribution. Our findings are consistent with childhood ADHD literature with respect to diminished posterior gamma activity in patients, which may reflect altered dorsal attention network functions. Gamma abnormalities might provide a link between neurophysiological functioning and neuropsychological deficiencies, thereby offering an opportunity to investigate the neurobiological mechanisms that underlie the clinical symptoms of ADHD.